Sustainable Salon

Learning material Sustainable salon

Student manual Module 1

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Future skills for a better life in Sustainable Salons is a European project that aims to combine the sustainable ideas through education and training with innovative ideas within the sector.

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Index

1. Sustainability, climate change and carbon footprint 4
1.1 Sustainability 4
1.2 Climate change 14
1.3 Carbon footprint 23
2. Energy and sustainability 31
2.1 General concept of energy 32
2.2 Types of energy 33
2.3 Electrical Energy 33
2.4 Energy sources 35
2.5 Environmental Impact of Energy 39
3. Water 43
3.1 Water - a resource threatening to become scarce 45
3.2 How can we save water with simple steps and why should we? 47
3.3 Water pollution 48
3.4 Wastewater purification 54
4. Waste 56
4.1 Why is waste a growing problem? 56
4.2 Reduce – reuse – recycle and how to do it wisely 56
4.3 What is circular economy? 58
4.4 How can waste be new 'raw material'? 60
4.5 Beat the microplastics 61
5. Raw materials 62
5.1 Definitions and classifications 62
5.2 Raw materials in products and equipment: where is what 65
6. Management 69
6.1 Who is a business manager? 69
6.2 Manager or owner 71
6.3 Management activities in a beauty salon 71

1. Sustainability, climate change and carbon footprint

Introduction to this lesson

This lesson is the beginning of a whole range of material concerning sustainability in different ways. In this part you will learn what sustainability means. You will get information on scans that can be used to measure your level of sustainability.
You will also learn about climate change and carbon footprint, also how to calculate your carbon footprint as a consumer and how to reduce it personally.

Summary

1.1 Sustainability
The concept: What does “sustainability” mean?
When are you sustainable?
Scans on sustainability
1.2 Climate change
Definition
Unhealthy planet
Climate conferences and sustainable development goals
1.3 Carbon footprint
Definition
The Consumer Footprint Calculator (general)
How to reduce your personal carbon footprint?
Conclusion and sources

1.1 Sustainability

No one knows what the future holds. But suppose you were to be a step closer, you could make preventive adjustments to become one of the better salons in the near future.
Were you already thinking about the profile of the hairdresser anno 2030? What will be expected of you?
To be sure, the focus will be on sustainability, digitalization and entrepreneurship.
But what do you already know about these topics and how can your know-how help us to write the correct profile?
With this educational material, we will find out together. Keep in mind that it’s not only the beauty of the hair you need to see, but also the beauty of our planet.

The concept: What does "sustainability" mean?

The capacity to support or maintain a process continuously over time is the broadest description of sustainability. In the environment of business and policy, sustainability aims to save the vacuity of natural or physical coffers over time by precluding their reduction. There are three pillars to the conception of sustainability profitable, social, and environmental — generally appertained to as gains, earth, and people. In that breakdown, the idea of "profitable sustainability" focuses on conserving the natural coffers that give the physical inputs for profitable product. These inputs can be renewable or run out.

The idea of "environmental sustainability" places a greater emphasis on the life support systems, like the atmosphere and soil, that need to be maintained in order for economic production and human life to exist. Social sustainability, on the other hand, looks at how economic systems affect people and includes efforts to end hunger and poverty as well as fight inequality.
The World Commission on Environment and Development was established by the United Nations in 1983 to investigate the connection between social equity, economic development, and ecological health. In 1987, the commission, which was headed by Gro Harlem Brundtland, a former prime minister of Norway, published a report that has since become the standard for defining sustainable development.

"Meeting the needs of the present without compromising the ability of future generations to meet their own needs" is how sustainable development, or the blueprint for achieving sustainability, is defined in that report.

Sustainability encompasses more than just environmental protection in business contexts. Sustainable business practices can be evaluated in two ways, according to Harvard Business School:

the impact that a company has on society and the environment—the objective of sustainable business practices is to have a positive impact on at least one of these areas.
Businesses are encouraged to strike a balance between immediate returns and long-term advantages as a result of this view of responsibility, as well as the objective of pursuing goals that are inclusive and environmentally friendly. This covers a wide range of possible methods. Moving toward sustainability would include reducing energy consumption, sourcing goods from fair-trade organizations, and ensuring that their physical waste is disposed of properly and with a smaller carbon footprint.

Additionally, sustainability targets have been established by businesses, such as a pledge to eliminate all packaging waste by a certain year or a percentage reduction in emissions overall.
The search for new deposits to outpace the drawdown of existing reserves has been the primary focus of the push for sustainability in energy generation as well. For instance, some electricity companies now make public their goals for generating energy from renewable sources like wind, hydropower, and solar.

Some businesses have been accused of "greenwashing," which is the practice of giving the impression that a company is more environmentally friendly than it actually is. These policies typically result in public goodwill. Companies that successfully implement sustainability strategies reap financial benefits in addition to the social benefits of enhancing human needs and the environment. Sustainable resource use can boost a company's long-term viability, and reducing waste and pollution can also help a business save money.

A business can save money on utility bills and enhance its public image by, for instance, installing plumbing and lighting fixtures that are more energy-efficient. Companies that implement certain sustainability practices may also qualify for tax breaks from the government.
A company's sustainability can also make it more appealing to investors. According to a 2019 HEC Paris Research paper, shareholders are willing to pay €70 more for a share in a company that donates at least one euro per share to charities because they value the ethical aspects of the company so highly. Additionally, the study revealed a decline in valuation for businesses thought to have a negative social impact.

Harvard Business Review has argued that the perception that environmental, social, and governance issues are not mainstream in the investment community is outdated, based on interviews with senior executives from 43 global investing firms.

According to Harvard Business Review, the "sea change" in investor attitudes stems from investors' increased commitments. When the Principles for Responsible Investment initiative, supported by the United Nations, launched in 2006, 63 investment firms with $6.5 trillion in assets under management committed. It had 1,715 businesses with $81.7 trillion in assets in 2018.
Sustainability strategies can be implemented by businesses in the same way that other strategic plans are created.

Finding a specific weakness or shortcoming is the first step in integrating sustainability practices. A company might discover, for instance, that it produces too much waste or that its hiring practices harm the communities in the area. The company should then decide on its objectives and the metrics it will use to evaluate its progress. Either a specific percentage goal for diversity hiring or an ambitious target for carbon footprint reduction can be set by an organization. The business will be able to see objectively if its objectives have been met as a result of this.

The strategy's implementation and evaluation of its outcomes are the final steps. This necessitates ongoing re-evaluation due to the possibility that a company's objectives shift as it expands. Companies aiming for sustainability frequently run into a few common pitfalls. The knowledge-to-action gap is one of them: Even though a lot of executives list sustainability as one of their top business values, few of them actually do anything about it.

The compliance-competitiveness gap is yet another. While increasing a company's sustainability metrics can boost its market competitiveness, these objectives should not be confused with mandatory compliance obligations. Compliance is required, despite the fact that sustainability is desirable.

The three fundamental concepts of environmental, social, and economic sustainability—sometimes referred to as "people, planet, and profits"—are referred to as the principles of sustainability. This means that a company must be able to support a healthy community and workforce, conserve natural resources, and generate sufficient revenue to maintain long-term financial viability in order to be considered sustainable.

By using renewable energy or reducing waste, many sustainable businesses seek to reduce their environmental impact. Promoting diversity and fairness in the workforce or enacting policies that benefit the local community may also help businesses become more sustainable.
A company's ability to continue its operations over a long period of time is referred to as its economic sustainability. A company must be able to guarantee that it will have enough resources, workers, and customers for its products into the foreseeable future in order to be economically sustainable.

More and more companies and businesses are looking for ways to minimize their effects on the environment and their community as consumers become more environmentally conscious. Companies can continue to attract customers while highlighting their social benefits through sustainability practices.

What do you think "sustainability" means being a hairdresser? Write down words or short sentences on the assignment paper.

Would you be able to give a definition to the word "sustainability"? Write it down on the assignment paper.

When are you sustainable?

Sustainable living is both a way of life and a philosophy; the term is as well-known as it is nuanced. It is promoted by well-known activists, NGOs, and lifestyle blogs, and it is used in everything from cotton t-shirts to water-saving showerheads in marketing and advertising.
However, what exactly does it imply? In general, sustainable living entails making decisions and acting in ways that promote human and environmental health while remaining within our means. We prioritize the use of renewable resources without jeopardizing the ability of future generations to

meet their own needs by practicing sustainability in our household (such as composting), community, and lifestyle.

However, sustainable living extends beyond the individual. Sustainable living, like its broad scope, can mean different things to different people. Sustainable living trends present an opportunity to greenwash products and enter the eco-market as they are adopted by brands and businesses seeking revenue. Values of sustainability are deeply ingrained in the cultures of conscious individuals and their communities. Traditional ecological knowledge (TEK) is the fundamental environmental knowledge derived from a group's historical traditions and experiences, even though not all traditions can be generalized. TEK is the blueprint for what we now know as sustainable living. It acknowledges the ecological effects of biodiversity and the ways in which human activity can affect an environment's carrying capacity.

Additionally, sustainable living may not have any cultural significance at all for some people; rather, it may be a mode of living that is contingent on their socioeconomic status. Sustainable choices and investments can be costly, and a sustainable lifestyle may not always be financially feasible for everyone.

Put simply: The system for sustainable living is not perfect. Instead, the process of moving toward sustainability in our homes, communities, and ways of life is a process of change that is unique to each person. Individual actions to reduce our environmental impact are emphasized in sustainable living, but do our choices actually matter? Yes is the straightforward response, but there is more to it. Individual choices do not make a difference when it comes to addressing sustainability issues like climate change and environmental degradation, but they do make a difference. Individual actions are valuable contributions to a larger, more powerful movement aimed at reducing human impact on the environment and are a part of the collective. In a similar vein, adopting a sustainable way of life benefits not only your own family but also the community, economy, and environment.

As part of your effort to eat more plants, you can reduce your risk of chronic illness by eating cleaner when you choose to buy from your local farmer. 2, supporting the local economy by shopping locally; and 3, reducing emissions of greenhouse gases by limiting the distance travelled to get the produce to you. Sustainable living involves more than just oneself, and each individual's actions do have an impact.

However, it is essential to keep in mind that not only the individual bears responsibility. Since 1988, just 25 corporate and state-producing entities have been responsible for more than half of all industrial emissions worldwide—that's nearly 500 gigatonnes of CO2 in the last 30 years. A contentious debate has arisen among the international community as a result of this startling dichotomy. When governments and major polluters lack accountability on a widespread scale, why encourage people to live sustainably?
This question is rejected in its entirety by the response!
In the discussion of climate action and environmental protection, it is a regrettable error to debate individual versus collective action. Individual behaviour change advocacy does not take away from the political and systemic action that is required to address the global environmental crisis. Instead, actions taken by individuals, groups, and politicians all work together to strengthen, deepen, and broaden the environmental movement. Environmental activism is not a zero-sum game.
As previously stated, sustainable living is a complex process with varying outcomes for each individual. When it comes to making decisions and alterations to one's lifestyle that are mindful of the environment, there are neither obligatory nor stringent requirements. Keeping this in mind, we can group our choices, actions, and behaviours for sustainable living into five easy-to-follow categories.

Similar to sustainable living, consuming less and changing how you consume is open-ended. We consume food, energy, water, and material goods like clothing, electronics, and lifestyle accessories—it's hard to know where to begin when we use the term "consumption."
We can do more than just turn off the lights when we leave a room to save energy. Saving money and energy can be significantly improved by purchasing appliances that use less energy.
Even though water covers 70% of the globe, only 2.5% of it is fresh water, and only 1% of it is easily accessible for human consumption. Global water consumption has increased more than twice as fast as population growth over the past century, adding to that alarming statistic. We can effectively reduce our overall consumption and alter the way we use water by leading a sustainable lifestyle. And it's not just about taking shorter showers, turning off the water when brushing your teeth, or letting the grass turn brown; changing how you behave as a consumer can also help you save water. A single cotton t-shirt, for instance, requires approximately 2,700 liters of water to produce. Instead, the next time your favourite white t-shirt gets a stain that can't be fixed, try shopping at a local thrift store or an ethical fashion brand. Also, ask yourself what ethical and sustainable fashion are.
Reducing waste is the second part of reducing consumption; the less we consume, the less we will waste! It's not easy to live a zero-waste lifestyle, and it seems that no matter what we do to reduce our waste, there will always be extra packaging, food that spoils, or headphones that break. Learning how to recycle is a great place to start in our efforts to reduce waste. For information on what can be recycled and where, consult your local municipality's guide.
Before throwing away non-recyclable goods, look for creative ways to repurpose them instead of purchasing single-use plastics. Composting is a great alternative to throwing food in the trash because organic matter accounts for approximately 60% of the materials that end up in landfills.
It promotes self-sufficiency and reduces our impact on the environment to address the challenge of finding new and sustainable ways to produce, create, and substitute goods and services that you would otherwise purchase.
When and where you can alter your shopping habits. Similar to other measures for sustainable living, depending on your financial flexibility, some choices and behaviours are more accessible and realistic than others. Even though it's better for the environment and more ethical to shop locally, it can be expensive and difficult to stock your kitchen with local products. Instead, check the grocery store for legitimate fair trade certifications and investigate the ethical standards and business practices of the brands you frequently purchase from.
We'll keep it short and sweet when it comes to stuff: Shop with intention rather than impulsively and less frequently. Think about buying goods that are well-made and less likely to be replaced frequently. Before you look for something brand-new, try thrift stores or a local clothing swap if you need new clothes.
However, if you're buying something new, try to support brands that use sustainable business practices.
It's easier than you might think to offset your emissions. Your daily carbon emissions are effectively offset when you choose to use public transportation, carpool, walk, or bike as your mode of transportation. When compared to driving the same distance in the city, walking 2.5 km will produce 75% fewer emissions of greenhouse gases. We are better for the environment and our bodies when we drive less.
This is probably the most significant factor in your carbon footprint if you fly frequently. Choose a less carbon-intensive mode of transportation when distances permit, such as taking the train or flying directly; landing and taking off procedures account for 25% of airplane emissions. But if you can't change how you travel, you might want to buy carbon offsets when you fly. By investing in projects that reduce emissions of carbon dioxide or other greenhouse gases, carbon offsets provide a means of combating pollution.
We are obligated to continue educating ourselves in the environmental debate, as the fundamental principles of sustainable living extend beyond our own homes and communities. Find ways to support your household and become familiar with local sustainable initiatives in your community,

but don't stop there. Learn how your individual actions might have an impact on the entire world by paying attention to environmental and climate-related events and their causes on a national and international scale.

Start a conversation with friends, family, co-workers, and neighbours about how to make choices and actions that are sustainable and considerate of the environment. Being an environmental steward requires raising awareness of the environment, and we can all learn something from one another.

Give to projects that promote sustainability. Even though not everyone is able to make a donation, charitable contributions to environmental initiatives at the local and international levels as well as causes dedicated to enhancing sustainability have the potential to have a measurable effect on the health of local people and the environment. Donate your time instead of money if you are unable to do so!

Even though it may appear to be an impossible feat for environmental causes, our vote and voice do have power. Advocate for environmental protection in your community and nation while also holding corporations, governments, and public servants accountable.

More than just saving the planet, sustainable living and all of its components are important. Sustainable choices, actions, and behaviours enhance your lifestyle, home, and community in a positive way. A sustainable community—and the world as a whole—is one that promotes human and environmental health in addition to supporting itself and its natural surroundings.

Make a list of actions you can use to become more sustainable at home.

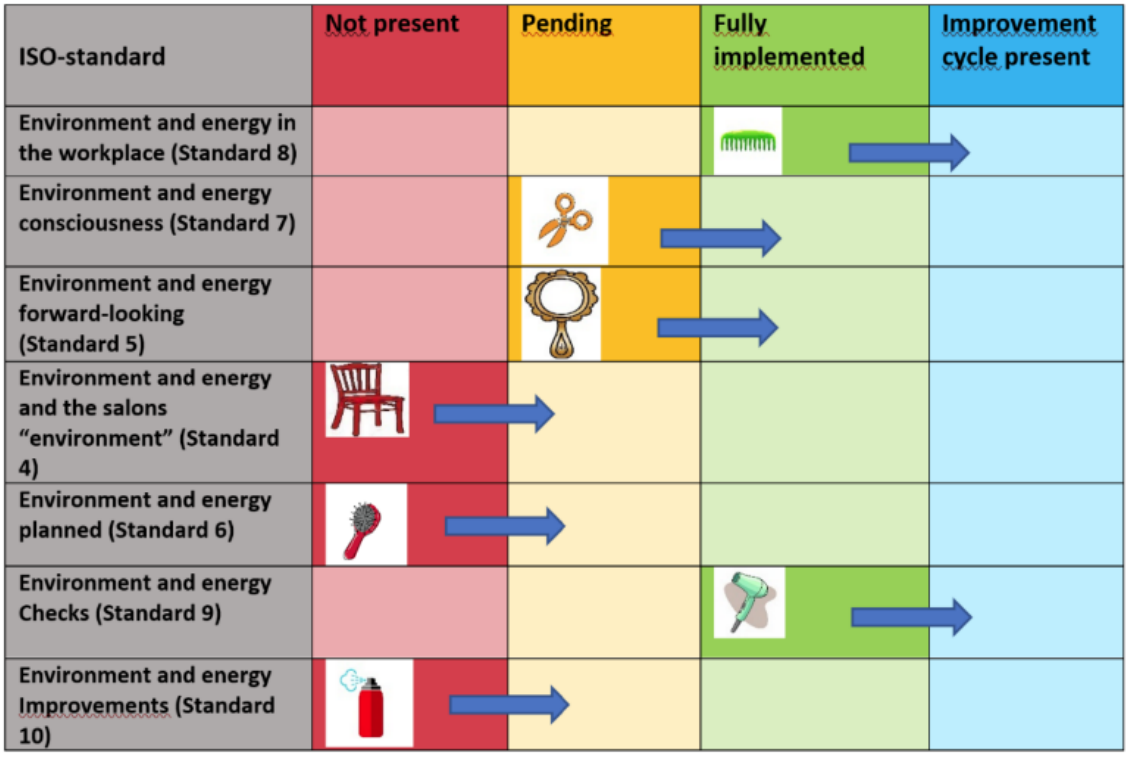
Find a salon that is working in a sustainable way. Make a presentation. Use the guidelines.

Scans on sustainability

The initial step toward a certified environmental care system is frequently too large for smaller businesses. A workbook was created specifically for these businesses to help them improve their practical environmental care step by step during the project's preparation.
In the context of a collaborative project between Europe and the United States dubbed: Skills for the future in Sustainable Salons for a better life. The European Union's Erasmus+ program provides funding for this project: No. 2020-1-NL01-KA202-06451 is the grant.

The participating organizations want schools and the hairdressing industry to have safe and environmentally friendly workplaces for all employees and students. This environmental care system has been developed as a result of this and can be utilized for free in schools and salons. Background information and a method to evaluate and improve the state of environmental care in a salon and school are included in this publication. This publication has concrete steps for working in an environmentally friendly way.

The ISO 14001 standard has several parts:



In the first column the practical translation in accordance with the ISO norm standard is mentioned. The 2-3-4-5th column shows the phases the company goes through using the plan-do-check-act method. The improvement mechanism from 'not present'(red) to a company 'improvement cycle present'(blue).

One of the main goals of the Project Future skills for a better life in Sustainable Salons is to develop self-assessment tools on environment in the school and salon. We have developed 4 tools:

- two awareness tools for school and salon
- one extended tool to map the status of the environment in the school or salon
- one tool on the organizational aspects on environment.

The tools are internet based and work on telephone, tablet or PC. The languages of 3 self-assessment tools: English, Dutch, Italian, Spanish.

- Awareness scan schools: https://zelfscan.eu/awareness_schools
- Awareness scan salons: https://zelfscan.eu/awareness_salons
- Extended self-assessment scan: Is your company/school sustainable?
- Scan Organization context of a sustainable salon (only in English)

We will divide in 3 groups to take the scans and process the results.

- **First group: You will take the awareness scan from 5 different teachers at 3 different hairdressing schools. You keep a good record of the results of the scans to create a clear overview in charts later.**
- **Second group: You will take the awareness scan in 15 different salons, preferably across the country. You keep a good record of the results of the scans to create a clear overview in charts later.**
- **First group + second group: You will take the extended scan in 5 different salons, depending on the need and the results of the awareness scan.**
- **Third group: You will take the scan on organization context of a sustainable salon from 5 recently opened businesses (up to 1 year) and 5 salons that are already open for more than 1 year, but less than 5 years and 5 salons that are open for more than 5 years.**

When making up goals for the future, you need to be aware of two different ways to do so. You can plan goals on a short term and you can plan goals on a long term. For each principle it is best to use the PDCA-circle, where the P stands for PLAN, the D stands for DO, the C stands for CHECK and the A stands for ACT.

The PDCA- cycle is a four-step model for carrying out change. Just as a circle has no end, the PDCA cycle should be repeated again and again for continuous improvement. The PDCA cycle is considered a project planning tool.

The Plan-do-check-act procedure

1. Plan: Recognize an opportunity and plan a change.
2. Do: Test the change. Carry out a small-scale study.
3. Check: Review the test, analyze the results, and identify what you've learned.
4. Act: Take action based on what you learned in the study step. If the change did not work, go through the cycle again with a different plan. If you were successful, incorporate what you learned from the test into wider changes. Use what you learned to plan new improvements, beginning the cycle again.

We divide into two groups.

- **Group 1: Make up a short term plan to achieve the goals set in the discussion.**
- **Group 2: Make up a long term plan to achieve the goals set in the discussion.**

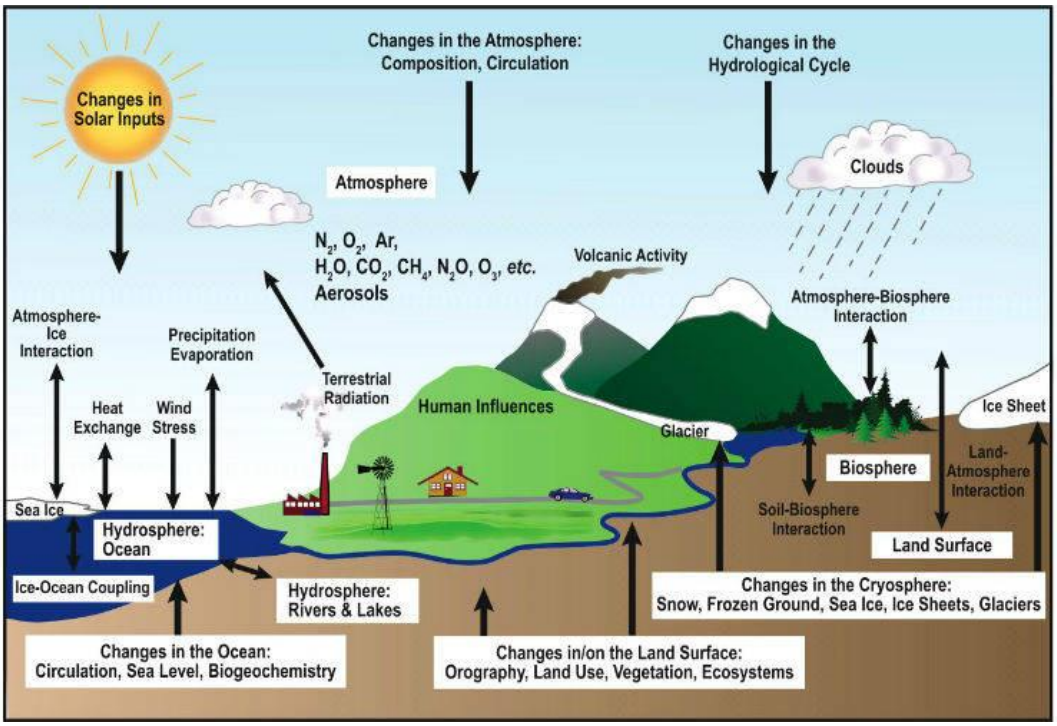
Use the template in the teacher's toolkit, including the PDCA-principles.

1.2 Climate change

We look at the 30-year average of temperature, humidity, air pressure, wind, cloud cover, and precipitation to determine the climate. It's also important how frequently extremes occur, both daily and annually. Heat waves and heavy rain that causes flooding or inundation are extreme examples. Understanding how the climate works is essential.

Earth is heated by the sun. While some of the sun's rays are reflected back, others are transformed into heat. Carbon dioxide and water vapor, two examples of greenhouse gases, obstruct some of the ground's thermal radiation. The earth would be much colder without this warm blanket effect.

The Earth's heat is significantly distributed by ocean currents and winds. The temperature difference between the tropics and the poles is kept to a minimum thanks to these heat transports. The connection that exists between the biosphere, which includes trees, plankton, and the ocean, the land surface, snow and ice, and the atmosphere is extremely significant.



Look at the picture. Give a concrete example for the given changes. Fill in the grid from the teacher's toolkit.

Definition

Temperature and weather patterns that change over time are referred to as climate change. These shifts might occur naturally, like when the solar cycle changes. However, the burning of fossil fuels like coal, oil, and gas has been the primary cause of climate change since the 1800s.

Emissions of greenhouse gases are produced when fossil fuels are burned, trapping the sun's heat and raising temperatures like a blanket.

Carbon dioxide and methane are two examples of greenhouse gas emissions that are influencing the climate. These come from, for instance, using gasoline to drive a car or coal to heat a building. Carbon dioxide can also be released when forests and land are cleared. Methane emissions originate primarily from garbage landfills. Among the most significant emitters are energy, industry, transportation, buildings, agriculture, and land use.

Emissions are also continuing to rise. The Earth is now approximately 1.1°C warmer than it was at the end of the 1800s as a result. The most warm decade on record occurred from 2011 to 2020.
Many people believe that the main effect of climate change is higher temperatures. However, the rise in temperature is only the beginning of the story. Changes in one area can have an impact on changes in all others because the Earth is a system in which everything is interconnected.

Water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms, and a decline in biodiversity are just some of the current effects of climate change.

Climate change can have an impact on our housing, safety, health, ability to grow food, and employment. Some of us are already more susceptible to the effects of climate change, such as those who live in developing countries or on small islands. Sea-level rise and saltwater intrusion have gotten so bad that whole communities have had to move, and prolonged droughts are making people more likely to starve. It is anticipated that the number of "climate refugees" will rise in the future.

Thousands of scientists and government reviewers agreed in a series of UN reports that limiting global temperature rise to no more than 1.5 degrees Celsius would help us avoid the worst climate impacts and maintain a livable climate. However, current policies indicate a temperature rise of 2.8°C by the end of the century..

Everyone is impacted by the global emissions that are causing climate change, but some nations produce significantly more than others. Three percent of all emissions are produced by the 100 nations with the lowest emissions. 68% of the total contribution comes from the ten nations with the most emissions. Everyone must address climate change, but individuals and nations that contribute more to the issue bear a greater responsibility to act first.

Numerous solutions to climate change have the potential to both enhance our quality of life and safeguard the environment at the same time. The Sustainable Development Goals, the United Nations Framework Convention on Climate Change, and the Paris Agreement are all global frameworks and agreements that can help us move forward. There are three main types of actions: reducing emissions, coping with the effects of climate change, and funding required adjustments.

The emissions that are causing climate change will be reduced by switching energy systems away from fossil fuels and toward renewables like solar and wind. However, we must begin right away. A growing coalition of nations has committed to net zero emissions by 2050; however, in order to keep global warming below 1.5°C by 2030, approximately half of the required reductions in emissions must be implemented. Between 2020 and 2030, fossil fuel production must decrease by roughly 6% annually.

People, homes, businesses, livelihoods, infrastructure, and natural ecosystems are safeguarded when we adapt to the effects of climate change. It addresses both current and likely future effects. Adaptation will be required everywhere, but the most vulnerable people with the fewest resources must prioritize it now in order to deal with climate hazards. The return rate may be high. Disaster early warning systems, for example, can save lives and property and provide benefits that can be ten times the cost of their initial implementation.

Governments and businesses must make significant financial investments in climate action. However, climate inaction is significantly more costly. For developing nations to adapt and move toward greener economies, industrialized nations must meet their commitment to provide $100 billion annually.

Unhealthy planet

We are all aware of the changes in the climate and that it is time to care for our precious planet. The time is running out, and it's running out quickly.
Life on Earth is well-suited to humans. To achieve optimal health and well-being, one must live in a healthy environment. On the other hand, environmental agents known as pathogens, which can be biological or physicochemical, frequently cause disease and early death. Human health is also at risk in a number of different ways, both directly and indirectly, from climate change, heat waves, floods, degradation of land, and the loss of biodiversity.

Cancer, accidents, and death are all caused or made worse by pollution. Indoor and outdoor air pollution are responsible for up to 7 million premature deaths annually. 1.7 million deaths are caused by contaminated drinking water. In 2016, over 24 million people were forced to leave their homes in almost 120 countries due to a lack of clean water and flooding.

Heat-related illnesses like heat cramps, heat exhaustion, and strokes are more likely to occur as temperatures rise. Food poisoning rises and productivity declines; Risk of kidney disease rises, as do rates of crime and insomnia. Both the prevalence of cardiovascular disease and workplace accidents rise. Debilitating disease outbreaks frequently coincide with shifts in agricultural practices and the clearing of land for farming. Malaria, schistosomiasis, and Guinea worm infestation are three of these, affecting 10 million, 200 million, and almost 300 million people annually, respectively. Dengue, filaria, and African river snail disease are other diseases that can be spread through a contaminated water supply (up to 60 million, 90 million, and 20 million people are infected annually).

Food or water contamination causes the deaths of four million children and babies each year from diarrheal diseases. Hundreds of times this many suffer from debilitating diarrhea and intestinal parasites. Over a million people worldwide die annually from malaria, out of more than 260 million cases. The majority of these are young children under the age of five.

In point of fact, environmental factors that are detrimental to human health account for up to a fifth of all deaths in the Europe region of the World Health Organization (WHO) map.

Environmental vs Population Health

It is generally acknowledged that between 1800 and 1990, there was a massive explosion in global population growth, with an increase of more than five times. Eight billion people live on the planet today, up from five billion in 1990.

Food, water, clothing, education, employment, and medical and social care have all been severely constrained as a result of this. Living conditions in satellite towns and cities have deteriorated to critical levels as a result of the shortfalls, which are largely the result of human greed rather than actual resource shortages. Some of the vicious cycles that are occurring as a result include inadequate facilities for sanitation and hygiene, a lack of clean drinking water, and noise pollution. An important factor in promoting illness and lowering quality of life is the absence of open spaces for recreation and exposure to natural elements, such as large parks with walking paths, bushes, and trees, as well as playgrounds and bike trails.

It is possible to reduce infant and child mortality while simultaneously improving maternal healthcare and expanding educational and employment opportunities. Global human and environmental health are also bolstered by any measures that improve quality of life and lower infant and child mortality rates.

Environmental Degradation

Acid rain is one global environmental issue that has a direct impact on health; air pollution; emission of greenhouse gases; removing hazardous materials; degrading the ocean; as well as the threat to biodiversity.

Industrial Pollution

Multiple pollutants that are harmful to the lungs, brain, bone marrow, nerves, kidneys, and skin are introduced into the air, water, and land as a result of industrialization. Accidents at work result in the release of enormous quantities of pollutants into the environment, which kill a lot of plants and animals.

Industries, agriculture, household chemicals, and improper waste disposal all contribute to the accumulation of hazardous chemicals in the environment. Some of these chemicals persist for decades at various levels of the food chain. Therefore, even if the production or release of such chemicals were immediately reduced, this would not result in a rapid reduction of these.

Resource Depletion

Consumerist lifestyles have been encouraged by governments for many decades, even in developed nations with low population growth, to encourage economic growth. However, this has put a strain on the limited supply of non-renewable resources like fossil fuels, wildlife, trees, water, and soil resources. In addition, the toxic effects of greenhouse gases add to the problem, accelerating global warming and creating ozone holes.

Natural resources are likely to be exploited in an unsustainable manner as developing populations join the rat race to acquire increasingly more consumer goods. This puts human and other species' chances of survival on Earth at risk. Therefore, it is necessary to understand health as being free of disease and in a position of strength regarding one's life and community development rather than identifying unsustainable consumption levels as indicators of prosperity and development.

The modern way of life involves ever-increasing amounts and types of exposure to chemicals over longer periods of time, including crucial life stages like fetal development, pregnancy, and old age.

Acid Rain

Acids made from sulfur and nitrogen oxides are formed from combustion products of fossil fuels that are released high into the atmosphere through tall chimneys. These acids then fall as acid rain or acid snow, destroying forests and acidifying lakes and soils. The acids could leach metals from solder, soil, pipes, and other materials, which could all end up in food and water that people drink.

Ozone Depletion

Chemicals like chlorofluorocarbons (CFCs) in aerosols, refrigerants, halons, and various organic solvents are causing damage to the stratospheric ozone layer. This could make it possible for higher levels of ultraviolet radiation to reach the earth's surface, making people more likely to get skin cancer, eye lens cataracts, and aging in general.

Air Pollution

Nearly three-quarters of the use of fossil fuels in developed nations is for power, industrial processes, transportation, and home heating, making them the leading cause of air pollution. Due to the production of energy, combustion of coal and biomass accounts for a significant portion of human disease. This is due to the fact that half of the world's population uses the latter for cooking and heating. The majority of low-income homes in the South suffer from severe air pollution.
Smoke, irritants for the lungs, cardiovascular toxins, and carcinogens are among the pollutants that result. For 90% of urban dwellers, air pollution is above WHO standards.

Global Warming

Additionally, the accumulation of greenhouse gases like carbon dioxide in the atmosphere contributes to both global warming and an increase in the average sea level. Carbon dioxide from burning fossil fuels accounts for more than half of this, while CFCs account for another quarter. Global temperatures are already between 0.8 and 0.9 degrees Celsius higher than they were before the Industrial Revolution, and they will reach 1.5 degrees Celsius in less than a decade. This has resulted in nearly a decade of the warmest years ever, putting thousands of millions of people at risk for heat exhaustion and heat stroke, both of which could result in death, even in countries in Canada and Northern Europe where there is no snow.

Heavy rains and flooding, drought and desertification, changes in the habitat and distribution of vectors, and an increase in the number of areas affected by diseases like dengue, filariasis, and malaria are additional effects.

Hazardous Waste

Another issue that could put the health of people who live near the disposal site in danger is the dumping of hazardous waste from highly industrialized nations in developing nations. This is because it is unlikely that such regions would have proper regulations for the practice. Rivers, lakes, and oceans can be polluted by runoff from dumps with such high levels of pollution.

Ocean Pollution

The majority of ocean pollution occurs close to the coast, particularly in large bays and seas. Fish and beach species can be tainted and eventually eradicated by biological and chemical pollution. Seafood poisoning and epidemics of foodborne diseases may result from this.

Sea levels have risen as a result of melting glaciers, and ocean pollution has increased as a result of rising water temperatures, the disappearance of aquatic species like coral reefs, and a lack of oxygen. This kind of pollution threatens fishing, making it more dangerous for fishermen to work in unfamiliar waters and putting many aquatic species in danger of extinction.

Over a billion people who live along the coast could lose their jobs as a result of unhealthy ocean and coastal water, and over 3 billion people who rely on fish as their primary dietary component will face food insecurity. The loss of approximately $280 billion and the loss of up to 120 million jobs will result from the disappearance of coral reefs and dying fisheries.

Water Pollution

In the meantime, the pattern of precipitation has changed, glaciers have melted, the water table has changed, antibiotics, toxins, pollutants like micro- and nano-plastics, nutrients, and biological or infectious agents have built up. The release of industrial effluent causes water pollution as a result of unregulated industrial development.

Another significant cause of water pollution is the use of agricultural chemicals. Pesticide and fertilizer use that is too much affects the food chain, contaminates groundwater and other aquatic resources, causes algal blooms, and poses health risks to land and aquatic animals, including their deaths. As a consequence, water bodies are unable to process biodegradable waste or dilute non-biodegradable waste.

Due to inadequate regulation of these pollution sources, developing nations experience the greatest impact. Poor hygiene is linked to poverty, which makes environmental pollution worse by contaminating food and water with human and animal sewage. Access to safe, clean water for drinking and washing worsens when water sources are polluted.

Loss of Biodiversity

When species have disappeared in front of our very eyes over the past few centuries, the threat to biodiversity has never been greater. Humans may lose a food, medicine, or pest control source if a species goes extinct. Worse yet, it has multiple repercussions, including the loss of genetic material, organisms, or entire ecosystems.

Since human life depends on the presence of sufficient numbers of multiple other species, it is essential to maintain a habitat that is friendly to other species in order to maintain ecological balance. As demonstrated above in the case of ocean and freshwater pollution that compromises the availability of seafood, environmental degradation that puts plant and animal life in danger will invariably lower the quality of human life.

Again, infectious disease-carrying insects can expand their habitat, multiply, and constitute a larger portion of the insect population as a result of global warming.

Through the encroachment of humans into their habitat in the name of development, wild animal hosts that harbor numerous pathogens capable of infecting humans and causing zoonotic disease may also be brought into greater frequency and closer proximity to humans.
The availability of traditional medicines and foods made from plants, which are the most abundant and cheapest sources of both, is also threatened by a decline in biodiversity. It also makes it harder for natural environments like croplands and fisheries to fight pests, resupplies nutrients in the soil, and helps plant pollinators grow healthy crops. The resulting spread of invasive species and the growing smuggling of wildlife, timber, and seafood all contribute to the decline of biodiversity.
The widespread use of insecticides to reduce the number of mosquitoes and, as a result, control diseases transmitted by mosquitoes may result in the accidental extinction of species.

Land Degradation

Polluted and degraded land is being converted from natural forest, plains, marsh, or delta to artificial farming systems. The way land is used to grow meat, eggs, and milk-producing animals rather than grains, pulses, and vegetables, which could feed many times as many people with the same amount of land and other inputs, is one example.
Despite the fact that more food is being produced than ever before, a significant portion of the world's population is still malnourished and undernourished, vulnerable to disease and premature death, and unable to grow or purchase sufficient food. Farming systems may soon reach the tipping point as the soil loses its fertility, pollinators die out due to habitat loss, pesticide use, and parasitic infestation, and topsoil is lost to winds and floods.
Coastal populations are being pushed out by rising sea levels and/or losing their means of subsistence. Microplastics are ingested and concentrated by animals and humans as a result of environmental plastic pollution, affecting numerous physiological pathways.

Sound Policy is Fundamental

Natural systems break down when policies for sustainable development aren't used to grow enough food, make goods, get rid of waste, get raw materials, or move people and goods. This puts future generations' health and survival in jeopardy as well as leaving behind a world that is becoming increasingly fragile and toxic.

Read the article by clicking on the link
https://www.theactuary.com/features/2021/10/07/unhealthy-planet-unhealthy-people **or ask your teacher to get the text on paper. Answer the questions on the sheet.**

Climate conferences and sustainable development goals

The United Nations Framework Convention on Climate Change (UNFCCC) serves as the backdrop for the annual United Nations Climate Change Conferences. They are the official UNFCCC parties' meeting (Conference of the Parties, COP) to evaluate progress in combating climate change and to negotiate the Kyoto Protocol, which imposes legally binding obligations on developed nations to reduce their emissions of greenhouse gases, beginning in the middle of the 1990s.
The conferences have also been known as the "Conference of the Parties Serving as the Meeting of Parties to the Kyoto Protocol" (CMP) since 2005. Additionally, parties to the convention who are not parties to the protocol are permitted to observe meetings pertaining to the protocol.
As part of the Durban platform, the meetings were used to negotiate the Paris Agreement from 2011 to 2015, which established a general path toward climate action. A COP's final text must be agreed upon by consensus.

In 1995, Berlin hosted the first United Nations Conference on Climate Change.

An overview of the most important Conferences of the Parties

1997: COP 3, Kyoto, Japan

The third COP took place in Kyoto, Japan, from January 1 to December 11. The Kyoto Protocol, which outlined Annex I countries' obligation to reduce greenhouse gas emissions and included Kyoto mechanisms like emissions trading, the clean development mechanism, and joint implementation, was adopted after lengthy negotiations.

Bunker fuels and emissions from multilateral military operations would not be included in national emissions totals and would instead be reported outside of those totals, according to a separate decision made by the Conference of Parties.

Most industrialized nations and a few focal European economies experiencing significant change (all characterized as Extension B nations) consented to legitimately restricting decreases in ozone depleting substance outflows of a normal of 6 to 8% under 1990 levels between the years 2008-2012, characterized as the principal discharges spending plan period. The United States would have to cut its total emissions by an average of 7% below what they were in 1990; Despite Clinton's signature, Congress did not ratify the treaty. In 2001, the protocol was categorically rejected by the Bush administration.

2000: COP 6, The Hague, Netherlands

From November 13 to November 25, 2000, COP 6 took place in The Hague, Netherlands. The conversations quickly developed into a high-level negotiation regarding the most important political issues. These included the intense debate surrounding the United States' proposal to grant credit for carbon "sinks" in agricultural and forest lands that would fulfill a significant portion of the nation's emissions reductions in this manner; disagreements regarding the penalties for nations that did not meet their emission reduction goals; as well as difficulties in figuring out how developing nations could get financial help to deal with the negative effects of climate change and fulfill their plans to measure and possibly cut greenhouse gas emissions.

The EU countries as a whole, led by Denmark and Germany, rejected the compromise positions in the final hours of COP 6, and the talks in The Hague collapsed despite some compromises that were agreed upon by the United States and some EU countries, particularly the United Kingdom. The President of COP 6, Jan Pronk, suspended COP-6 without agreement in the hope that negotiations would resume later. Following that, it was made public that the COP 6 meetings—known as "COP 6 bis"—would resume in Bonn, Germany, in the second half of July. The parties to the UNFCCC had scheduled their next regularly scheduled meeting, COP 7, for October–November 2001 in Marrakech, Morocco.

2001: COP 6, Bonn, Germany

On July 17–27, 2001, negotiations for COP 6 resumed in Bonn, Germany, with little progress made toward resolving the disagreements that had led to an impasse in The Hague. However, this meeting took place after George W. Bush became President of the United States and, in March 2001, rejected the Kyoto Protocol; Consequently, the United States delegation to this meeting decided to act as an observer rather than participate in Protocol-related negotiations. Given the low expectations that existed prior to the meeting, most observers were surprised to learn that agreement was reached on the majority of the major political issues as the other parties negotiated the key issues. Among the agreements were:

1. Modular mechanisms: Emissions trading, joint implementation (JI), and the Clean Development Mechanism (CDM), which allows industrialized nations to fund emissions reduction activities in developing nations as an alternative to domestic emission reductions, were among the "flexibility mechanisms" that the United States had strongly favored when the Protocol was first

drafted. There would be no quantitative limit on the credit a country could claim from using these mechanisms, provided that domestic action was a significant part of each Annex B country's efforts to meet their targets. This was one of the key provisions of this agreement.

2. Sinks for carbon: There would be no overall cap on the amount of credit that a nation could claim for sinks activities; instead, credit would be granted for a wide range of activities, such as forest and cropland management and re-vegetation, that either store or absorb carbon from the atmosphere. For forest management, each Annex I nation is given country-specific caps in Appendix Z. Japan could therefore be credited with a limit of 13 million tons, or about 4% of its base-year emissions. Countries could only receive credit for cropland management for increases in carbon sequestration above 1990 levels.

3. Compliance: The final decision on the compliance procedures and mechanisms that would deal with non-compliance with Protocol provisions was deferred to COP 7. However, the broad outlines of the consequences for not meeting emissions targets included the requirement to "make up" shortfalls at 1.3 tons to 1, the suspension of the right to sell credits for excess emissions reductions, and a mandatory compliance action plan for those who were not meeting their targets.

4. Financing: There was agreement on the establishment of three new funds to help with climate change-related needs: 1) a climate change fund that provides support for a number of climate measures; 2) a fund for countries in the least developed that will help National Adaptation Programs of Action; and, thirdly, a fund for adaptation to the Kyoto Protocol that is funded by voluntary contributions and a CDM tax.

The major issues that were discussed at the subsequent COP 7 meeting were a number of operational details that were connected to these decisions that needed to be negotiated and agreed upon.

2010: COP 16/CMP 6, Cancún, Mexico

From November 28 to December 10, 2010, COP 16 was held in Cancun, Mexico.

The states' parties agreed on a deal at the summit that called for a "Climate Technology Center" and network as well as the "Green Climate Fund," which would receive $100 billion annually. However, no agreement was reached regarding the Green Climate Fund's funding. The Kyoto Protocol's second period was also not agreed upon, but it was decided that 1990 would serve as the base year and that the IPCC's global warming potentials would be used.

"Recognizing that climate change represents an urgent and potentially irreversible threat to human societies and the planet, and as a result, necessitates to be urgently addressed by all Parties," according to all parties. It acknowledges that all parties should immediately take action to achieve the IPCC Fourth Assessment Report goal of a maximum global warming of 2 degrees Celsius. It also agreed that emissions of greenhouse gases should peak as soon as possible, but acknowledged that this will take longer in developing nations because poverty eradication and social and economic development are their top priorities.

2015: COP 21/CMP 11, Paris, France

From November 30 to December 12, 2015, the COP 21 took place in Paris. The Paris Agreement, which governs measures to reduce climate change beginning in 2020, was approved on December 12. The Durban platform's work, which was established at COP17, came to an end with this agreement's adoption. On November 4, 2016, the agreement will come into effect and take full effect. With over 55 nations ratifying the Agreement, which accounts for at least 55% of the world's greenhouse gas emissions, the adoption threshold was met on October 4, 2016.

2022: COP 27/CMP 17/CMA 4, Sharm El Sheikh, Egypt

Countries delivered a package of decisions at COP27, which was held against a difficult geopolitical backdrop. These decisions reaffirmed their commitment to limit global temperature rise to 1.5 degrees Celsius above pre-industrial levels. The package also bolstered countries' efforts to reduce

emissions of greenhouse gases and prepare for the unavoidable effects of climate change, as well as increased financial, technological, and capacity-building assistance for developing nations.
With the issue being added to the official agenda and being adopted for the first time at COP27, the establishment of a specific fund for damage and loss represented an important step forward.
To help developing nations respond to loss and damage, governments made the ground-breaking decision to establish new funding arrangements and a dedicated fund. At COP28 next year, governments also agreed to set up a "transitional committee" to recommend how to make the new funding arrangements and the fund work. The transitional committee is expected to meet for the first time before the end of March 2023.

The institutional arrangements for making the Santiago Network for Loss and Damage operational were also agreed upon by the parties in order to facilitate technical assistance for developing nations that are particularly susceptible to the negative effects of climate change.

Check the website: https://www.un.org/en/climatechange/paris-agreement and name the 3 key elements of the Paris Agreement.

Sustainable Development Goals

The Sustainable Development Goals are a call to action for all nations, rich, poor, and middle-income, to promote prosperity and preserve the environment at the same time. They are aware that addressing a variety of social needs, such as education, health care, social security, and job opportunities, as well as combating climate change and protecting the environment, are necessary if poverty is to be eradicated.
Number 13 of the 17 goals requires immediate action to combat climate change and its effects. However, climate change is influenced by all objectives, and vice versa. Without accelerating the achievement of goals like Goal 7, which focuses on affordable and clean energy, or Goal 12, which focuses on responsible consumption and production, we will not make much progress on climate action. A just transition to renewable energy centered on providing decent work, the focus of Goal 8, or the development of resilient infrastructure under Goal 9 can support the goals.
Numerous governments face difficulties with the Agenda 2030 for Sustainable Development of the United Nations. With a total of 17 goals and 169 sub-goals, Agenda 2030 is an integrated approach to the various aspects of sustainable development. goals that are also linked together.

Look at the small video on YouTube https://www.youtube.com/watch?v=b6qPnu82OVU and answer the key questions.

1.3 Carbon footprint

The amount of carbon dioxide released into the atmosphere as a result of your own energy consumption is known as your carbon footprint. You require food, clothing, electricity, transportation, and other goods. The choices you make can have an impact.
The term "footprint" is a metaphor for an item's total impact when discussing climate change. Additionally, the term "carbon" refers to all of the various greenhouse gases that contribute to global warming.

The mitigation of the effects of global climate change, enhancement of public health, expansion of the global economy, and preservation of biodiversity are all benefits of reducing your carbon footprint. We can help ensure cleaner air, water, and food for our generation and future generations by cutting carbon emissions.

Definition

Nowadays, the quantity of carbon emitted by an activity or organization, typically expressed in tonnes, is frequently abbreviated as a "carbon footprint." Because it is a competing demand for biologically productive space, the carbon footprint is also an important part of the ecological footprint. If there is not enough biocapacity dedicated to absorbing these emissions, carbon emissions from burning fossil fuels build up in the atmosphere. As a result, the quantity of productive land required to store carbon dioxide emissions is used to represent the tonnes of carbon dioxide emissions when the carbon footprint is reported within the context of the total ecological footprint. This reveals the amount of biocapacity required to neutralize fossil fuel combustion emissions.
The fact that the carbon footprint is measured in terms of land area does not imply that carbon sequestration is the only way to solve the problem of carbon. It merely demonstrates the amount of biocapacity required to manage our untreated carbon waste and prevent carbon accumulation in the atmosphere. By measuring it in this way, we can deal with the problem of climate change in a holistic way that doesn't just shift the burden to another natural system. In point of fact, the planet's lack of biocapacity to neutralize all carbon dioxide from fossil fuels and meet all other demands is the root cause of the climate crisis.

Additionally, this framework situates climate change within a broader context that encompasses all of the current ecological threats. The rapid extinction of species, deforestation, overgrazing, collapse of fisheries, food insecurity, and climate change are all components of a single, broader issue: The Earth simply cannot meet the demands that humanity places on it. Instead of addressing one problem at the expense of another, we can address all of its symptoms by concentrating on the one problem. Additionally, it makes acting out of self-interest much more obvious.
At the moment, the carbon Footprint accounts for 60% of humanity's total Ecological Footprint and is the component that is expanding at the fastest rate. Since 1961, humankind's carbon footprint has grown by 11 times. The most crucial step we can take to end overshoot and live within our planet's limits is to reduce our carbon footprint.

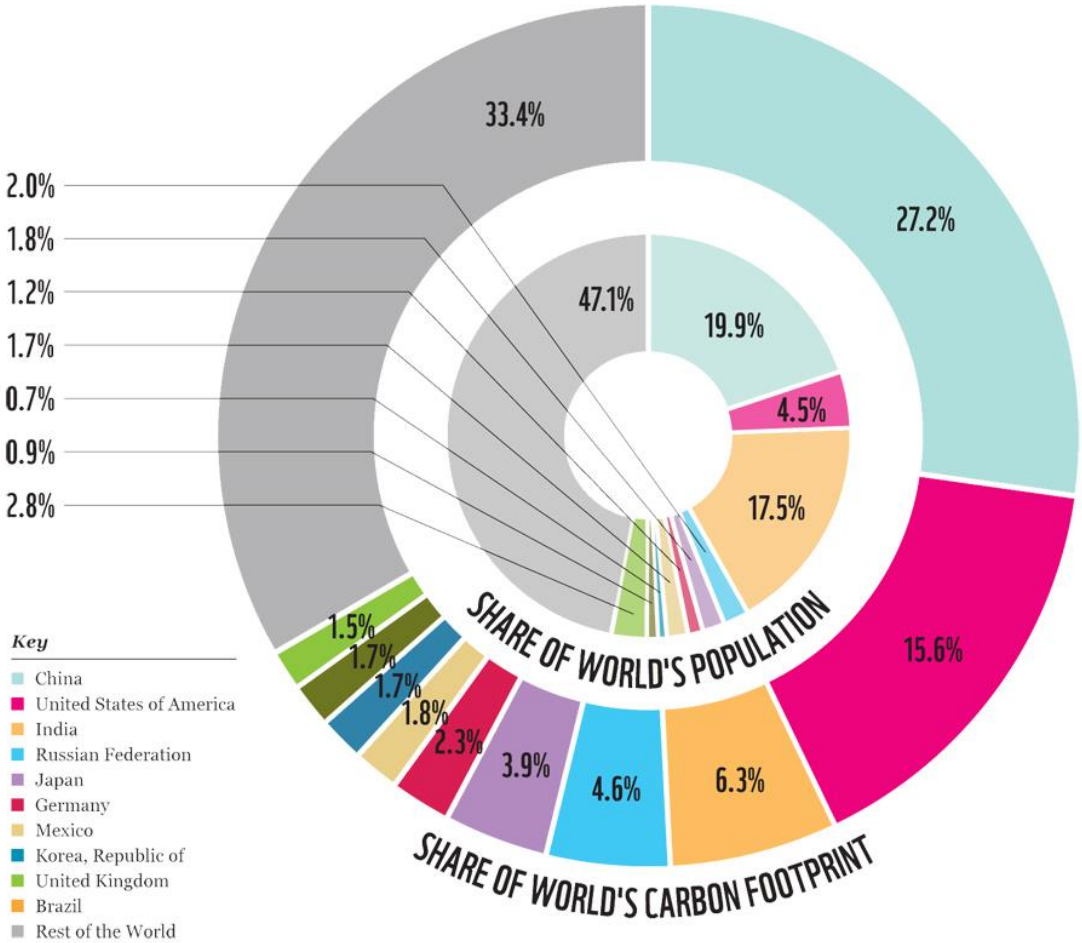
Paris Climate Agreement
The climate agreement that was approved in Paris in December 2015 was a significant and historic step toward reimagining a world without fossil fuels. The fact that nearly 200 nations, including oil-exporting nations, agreed to limit global temperature rise to well below 2 degrees Celsius and, to the surprise of many, to pursue efforts to limit it to 1.5 degrees above pre-industrial levels is nothing short of amazing.

These daring actions suggest that fossil fuel use will end well before 2050. That will occur within many of our lifetimes—in 31 years. The math is not hard: According to the IPCC's 2014 report, achieving a greenhouse gas concentration in the atmosphere of 450 ppm CO2equivalent gives us a 66% chance of meeting the 2-degree Celsius (2°C) target set by the Paris Agreement. However, according to the National Oceanic and Atmospheric Administration (NOAA), which is part of the United States Department of Commerce, we will already be at 504 ppm CO2equivalent in 2020. This demonstrates the necessity of increasing sequestration and putting an immediate stop to carbon emissions from fossil fuels.

In contrast, each nation's pledges are anticipated to result in a temperature rise of between 3 and 7 degrees Celsius, exceeding the agreement's 2-degree limit or "global handrail." Countries are required to submit new emission reduction targets every five years in accordance with the final agreement. It remains to be seen whether this essential requirement will be sufficient to spur additional action.

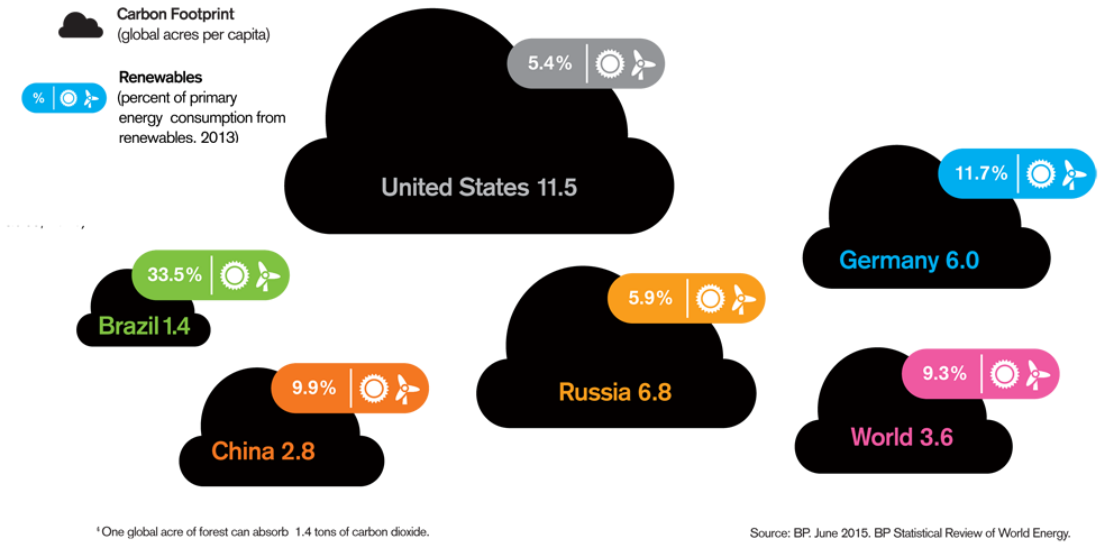
As implied by the agreement itself, adhering to the 2-degree limit will require much more than just a switch to clean energy; Part of the solution will also include managing land to meet multiple competing needs. If we truly move quickly and furiously away from fossil fuels, the demand for alternatives, such as forests as a fuel source, could put enormous new pressures on our planet if they are not well managed. The agreement also says that "sustainable management of forests and enhancement of forest carbon stocks in developing countries" will help cut emissions. Additionally, "aims to strengthen the global response to climate change...in a manner that does not threaten food production" are stated in the agreement.

Consumption, deforestation, agriculture and food production, and emissions are just a few of the factors that combine to highlight the significance of a comprehensive measure like the Ecological Footprint, which takes into account all competing demands on the biosphere, including CO2 emissions and the capacity of our forests and oceans to absorb carbon.



Renewable Energy

Still, one of the most effective ways for a nation to reduce its ecological footprint is to switch to renewable energy. On that front, many nations still have a long way to go.



The Consumer Footprint Calculator (general)

Still, switching to renewable energy sources is one of the most effective ways for a nation to cut down on its carbon footprint, which is crucial for understanding how people's actions affect global warming. To effectively contribute to halting global warming, at least on a personal level, one must therefore measure and track their own carbon footprint.
Online calculators come in handy in this situation. When you use the carbon footprint calculators from WWF or the UN, for instance, you'll be asked for information like: what you eat on a regular basis, how much you drive or fly, how big your house is, or what kind of electricity you get from the grid.

There are a few reasons why the result you get won't be perfect or very accurate. First and foremost, due to the fact that carbon footprint calculators employ standard values that may not always be appropriate in all possible circumstances. For instance, if you type in how many miles you drive on average, a specific reference value for CO2/emissions/mile will be multiplied by your miles and then by a year. However, both figures are merely estimates: Sometimes you drive more than you told the calculator, or maybe you drive an SUV instead of a 4x4 truck, as the calculator expects.
The extent to which your diet has an effect can also change: Consuming meat is, on average, very bad for the environment in terms of carbon emissions, but it also depends on where you buy it (locally produced meat has fewer emissions from transportation) and how cows are fed. Another reason is that, due to the difficulty of obtaining figures, these estimations frequently fail to take into account the products and services purchased.

In the end, the truth is that it is difficult to arrive at an exact number. Still, these calculators are the best available, so there's no reason not to find out what your carbon footprint is and work on improving it. You can use the Consumer Footprint Calculator to figure out how your consumption habits affect the environment and how changing your lifestyle might affect your personal footprint. Food, mobility, housing, household appliances, and household goods are the five categories of consumption that are taken into consideration.

The tool is based on a "life cycle thinking" approach, which means that it takes into account the effects of the products and energy you use throughout their entire life cycle.
The 16 environmental impact indicators covered by the Consumer Footprint calculator include resource use and emissions into the air, water, and soil. The European Commission's Product Environmental Footprint method uses these 16 indicators, which can be combined into a single score. You can use this calculator to assess the effects of your consumption to support SDG 12 on responsible consumption and numerous other Sustainable Development Goals.

How big is your consumer and carbon footprint and what can you do to improve it? Underneath there are different tests you can do on the internet.

- **https://knowsdgs.jrc.ec.europa.eu/cfc**
- **https://footprint.wwf.org.uk/#/**
- **https://eplca.jrc.ec.europa.eu/ConsumerFootprint.html**
- **https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/**
- **https://footprintcalculator.henkel.com/en**

How to reduce your personal carbon footprint?
From above, we can see that it's difficult to determine a person's exact carbon footprint. In addition, using figures that roughly reflect a person's local reality is essential for accurately reducing CO2 emissions.

If you think about it, the calculator probably thinks that the same emissions apply whether you drive an American SUV from brand A in New Zealand or a light Japanese car from brand B in Japan.

However, in order to arrive at a specific area of work, such estimates must be made, at least for the time being. And the fact of the matter is that even though there is a possibility that the beef you buy or your car pollutes less than the average value used: They continue to be excellent sources of CO2 emissions, so general guidelines apply.

As a result, and in accordance with the recommendations of the World Health Organization, there are five primary areas in which you can work to reduce your carbon footprint:

1. TRANSPORTATION – EXAMPLES OF GOOD & SUSTAINABLE BEHAVIORS

- Walk, bike, or take public transportation, especially trains, instead of taking a polluting car (each liter of fuel burned in a car engine emits more than 2.5 kg of CO2);
- If you're driving, share the ride with others and don't speed because doing so uses more gas and produces more carbon dioxide.
- Avoid flying, which emits CO2 at the fastest rate in the world. Consider offsetting your emissions if you do so.

2. FOOD – EXAMPLES OF GOOD & SUSTAINABLE BEHAVIORS

- Cut back on your intake of animal products;
- Consume food that is grown locally and in season: Short trips reduce transportation-related pollution;
- Compost or recycle organic waste. Otherwise, biodegradable waste will break down and release methane into landfills. These emissions make up less than 3% of all GHG emissions in the EU.

3. WATER USE – EXAMPLES OF GOOD & SUSTAINABLE BEHAVIORS

- Only use the dishwasher and washing machine when they are full;
- Cover your pots while you cook and boil only the water you need: You'll save a lot of energy and get the job done faster;
- Water your plants or garden with the cold water from your shower's first few seconds;
- Rather than relying on groundwater, collect rainwater from rooftops
- Install hand pumps to safeguard drinking water from flooding.

4. ENERGY USE – EXAMPLES OF GOOD & SUSTAINABLE BEHAVIORS

- Pay attention to the temperature in your home: Emissions and energy costs can be reduced by 5-10% with just 1oC less;
- Turn down the air conditioning in the cold because they use a lot of energy. Instead, use a fan;
- Set your energy devices to only turn on when you're about to return home;
- Increase the insulation in your home so that less heat escapes when it's cold and more heat enters when it's warm, reducing the need for additional devices;
- Be mindful of the choices you make: Maybe your refrigerator doesn't have to be on its coldest setting and your water cylinder thermostat doesn't have to be higher than 50 degrees;
- Remove the charger from your phone because it still uses electricity even when it is disconnected;
- Use energy-efficient lights like LEDs and turn off the lights when not in use.
- Switch to a greener electricity provider that uses more renewable (green) energy to support the growth of low-carbon energy sources.

5. WASTE MANAGEMENT – EXAMPLES OF GOOD & SUSTAINABLE BEHAVIORS

- Reduce what you need and reject what you don't need; When something reaches the end of its lifecycle, you should reuse it as many times as possible, repurpose it if you no longer need it, recycle or compost it;
- Reuse your shopping bag to save money on transporting your purchases home;
- Select items with minimal or no packaging: as a result, production costs are reduced.

Let's finish of this chapter with a creative assignment. You will work in pairs.
You will start up a campaign (poster, flyer) to make hairdressers aware of the impact of their carbon footprint and how to be as sustainable as possible. Make sure you tick of all the criteria given on the evaluation form.

Conclusion

You've got an introduction on sustainability. You should know by now whether you are sustainable yourself or not and how you can improve this. You also know what climate change means and what the consequences are for our precious planet Earth. Good to know there are climate conferences and sustainable development goals that will lead the world towards a better and more sustainable future. Keep up the good results by calculating your carbon footprint now and then and implement some actions to reduce your personal carbon footprint.

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2. Energy and sustainability

In hairdressing salons, a lot of energy is used to perform professional services (hairstyling, drying, dyeing...) but also to condition the premises. Can you imagine a hairdressing salon without electricity or hot water? That is why we are going to try to familiarize ourselves with the concept and origin of energy, its consequences for the environment, and what we can do, in our daily life, to reduce consumption and save money, which is always necessary.

We are very used to using words such as renewable energies, sustainability, electricity... and perhaps we do not know very well how to differentiate between all these concepts. That is why the first thing we should address is what we are referring to when we talk about energy and its types, as well as the different sources of energy that exist.

Summary

2.1 General concept of energy
2.2 Types of energy
2.3 Electrical energy
2.3.1 Concept of electrical energy
2.3.2 Electricity production
2.4 Energy sources
2.4.1 Types and characteristics of renewable energies
2.4.2 Types and characteristics of non-renewable energies
2.4.3 Nuclear energy
2.5 Environmental impact of energy
2.5.1 Clean energy
2.5.2 Effects on the environment
2.5.3 Other forms of environmental impact

2.1 General concept of energy

Energy is the ability of matter to do work because of its constitution (internal energy), its position (potential energy), its temperature (thermal energy) or its motion (kinetic or mechanical energy), among others.

To understand this definition we will give you an example: when you are drying a client's hair, the dryer emits air and heat thanks to the power of the motor and the electrical resistance (internal energy), if it runs at 220V it will emit more power than if it runs at 120V (potential energy) and, in addition, the air moves the hair (kinetic energy). Of course you could dry your hair using only heat or only movement, but the combination of both accelerates the process.

In short, we can say that energy is the capacity of bodies to do work and produce changes in themselves or in other bodies, allowing things to function.

If we look around us, we can see how energy is present everywhere. For example, the blades of a windmill move thanks to the energy produced by the wind, people walk thanks to the energy provided by food, bicycles move thanks to the energy produced by the movement of the pedals... Energy is therefore essential for life because it is the cause of the changes and transformations that we are constantly seeing around us.

Energy has 4 basic properties:

- **It transforms.** Energy is not created, but transformed, and it is during this transformation that the different forms of energy manifest themselves. E.g.: the sun's heat is transformed into mechanical energy when it heats the air and creates wind; or electrical energy is transformed into light energy when we switch on a lamp.
- **It is conserved**. At the end of any energy transformation process there can never be more or less energy than there was at the beginning, it is always conserved. Energy is not destroyed.
- **It is transferred or transported**. Energy passes from one body to another in the form of heat, waves or work.
- **It degrades**. Only a part of the transformed energy is able to produce work and the other part is lost as heat or noise (unwanted mechanical vibrations).

In short, energy is neither created nor destroyed, it is only transformed into another type of energy.

2.2 Types of energy

Energy can manifest itself in different ways and, depending on the actions and changes it can bring about, we can speak of energy:

Thermal. It is associated with the amount of energy that passes from a hot body to a colder body in the form of heat.
Mechanics. It is the energy created by bodies due to their motion.
Electrical. It is the energy generated by the movement of positive and negative electrons inside conductive materials.
Chemical. It is the one that manifests itself through different chemical reactions.
Electromagnetic. It is generated by the movement of electric and magnetic particles that move and oscillate at the same time and propagate through space.
Nuclear. It is the energy resulting from the disintegration of some atoms, as a consequence of the release of the energy stored in their nuclei.
Luminous. It is that which is present in light etc.

There are others but they are not applicable to the hairdressing salon, such as gravitational or radioactive.

2.3 Electrical Energy

Of all the types of energy that exist, we are going to take a closer look at electrical energy because it is the one we use most in our daily lives and because, in a hairdressing salon, electricity is responsible for the operation of all large and small electrical appliances (washing machines, hairdryers, irons, etc.), lighting and, in most cases, air-conditioning.

We don't usually stop to think about how electricity is generated, how it reaches our homes or businesses and why, at the flick of a switch or push of a button, we suddenly have light, can cook or listen to music. All around us there are all kinds of devices, vehicles and appliances that run on electricity. It seems like magic, and we have become so accustomed to this magic that we cannot conceive of life without electricity.

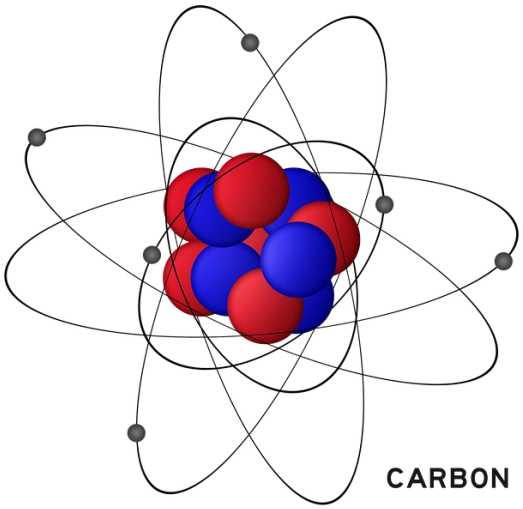
But behind every magic trick there is a scientific reason and that is what we are going to explain.

2.3.1 Concept of electrical energy

All bodies, or matter, are composed of atoms. The atom is the smallest part of a substance, and has a nucleus (center) composed of protons (positive particles) and neutrons (uncharged particles). Electrons (negative particles) move around the nucleus.

It is precisely this movement and interaction between the positive and negative electric charges inside conductive bodies that generates energy, which is what we call electricity.

This energy generated by electrical charges can manifest itself in four domains: physical (nature), luminous (light), mechanical (motion) and thermal (heat).



2.3.2 Electricity production.

Unlike primary energies that are obtained directly from nature (sun, wind, water, gas, etc.), electrical energy requires prior transformation before it can be consumed, which is why we say that it is a secondary energy.

How do we make this transformation?

The step-by-step process is as follows:

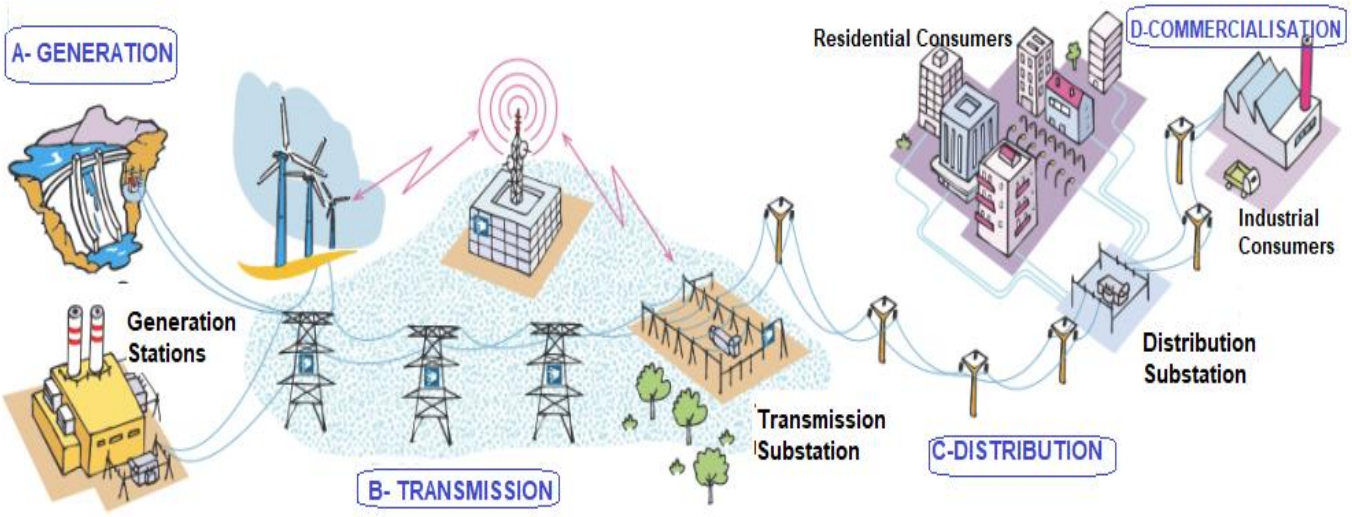
a) **Power generation**: Electricity is created in power plants capable of obtaining electricity from primary energies. These electricity generating plants are wholly or partly owned by private companies that sell the energy generated to the companies that market them (traders).

Did you know that? On a small scale and on an individual basis, we can also become a central electricity generator, for example by installing a solar panel on the roof of our house. This is called self-consumption, and even if we generate more electricity than we need, we can sell it and get financial compensation for it.

b) **Power transmission**: once the energy has been obtained and converted into electricity, it is transmitted overhead (pylons) or underground from the power plants to the substations. Substations are necessary to process the electricity and maintain the right voltage and are usually located outdoors near the power plants and/or on the outskirts of cities. If they are not very large, they can exceptionally be found in the city itself, inside a building.

c) **Energy distribution**: from the substations, electricity is sent to the nearest homes and industries. As a receiver of energy and a consumer, you cannot choose your distribution company, since depending on the area in which you live, you will be assigned to one or another. The distribution company will be responsible for ensuring that the electricity reaches your home correctly and will deal with any faults. It is also the owner of your electricity meter, and sends the meter readings to your electricity company (which is the one that charges you).

d) **Energy commercialization**: your **energy** commercializing company is the one you can choose and it will always be the one that sends you the bills, as it is the one that buys the energy from the generation companies and sells it to you. The energy suppliers will provide you with different rates and offers, although in Spain there is a free market where you pay according to the conditions of your contract, as in any other service rate (mobile, wifi, etc.) and a regulated market (you pay what is established by a system designed by the government).



2.4 Energy sources

In the previous point we have indicated that electricity is produced from other sources of energy that we originally found in nature without having been previously transformed, such as coal, natural gas, sun, oil... These primary energies are what we refer to when we talk about "energy sources", since without their prior existence we would not be able to generate electricity.

Energy sources can be classified into two main groups:

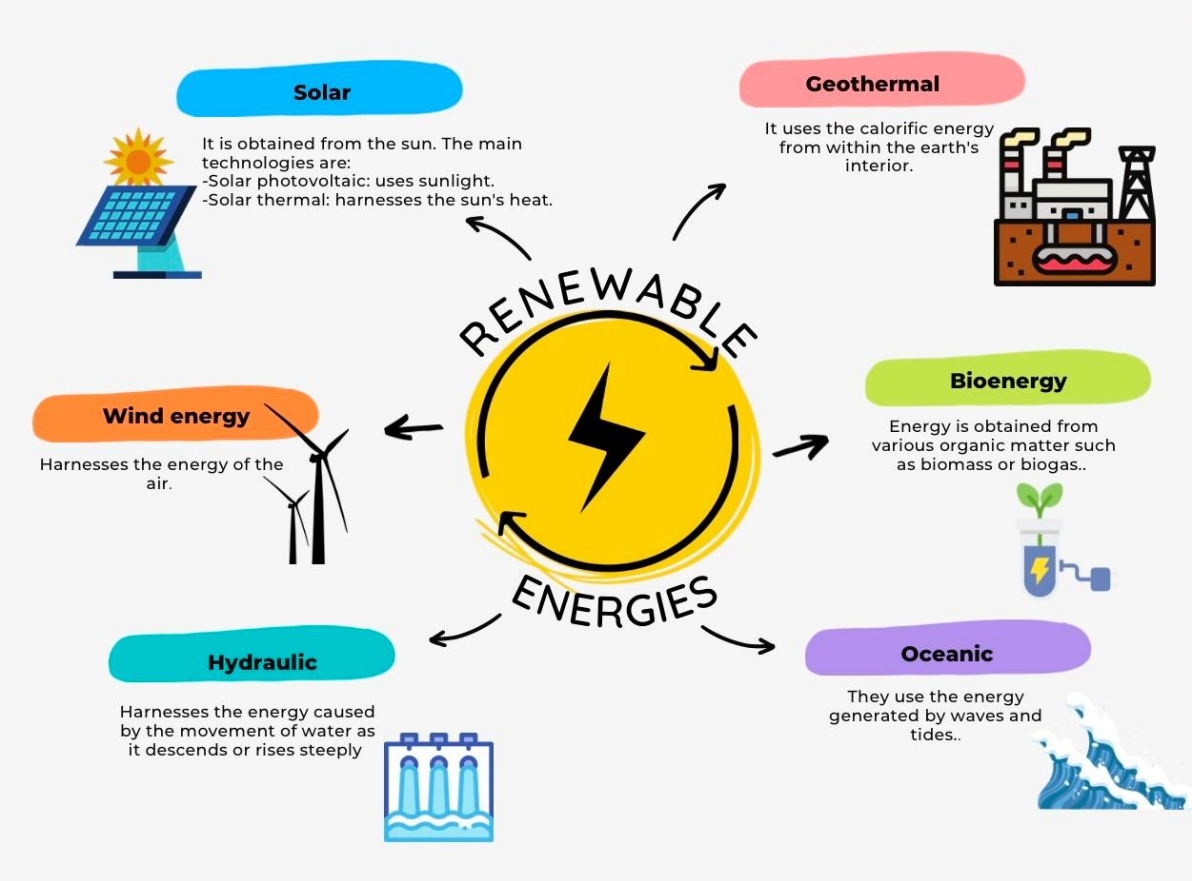
- Renewable energies.
- Non-renewable energies.

Renewable energies are a type of energy derived from inexhaustible natural sources, either because they contain an enormous amount of energy, such as the sun or the wind, or because they are capable of regenerating themselves in a short time, such as biomass.

Non-renewable energy sources are those energies that take millions of years to form and, therefore, their high consumption leads to their depletion (coal, oil and gas).

2.4.1 Types and characteristics of renewable energies.

Renewable energy sources are classified according to their origin:



FACT

Did you know that?

- There is a type of energy that comes from the physical interaction between fresh and salt water and is called **Blue Energy**.
- That we can extract the ambient energy contained in the air temperature and transfer it to air-condition a room or heat water by means of **aerothermal energy.**

Renewable energies are therefore universally accessible, available in all geographical areas of the planet, and within the reach of all countries regardless of their economic power.

In the following diagram you can see the advantages of renewable energies:

However, it must be borne in mind that the performance of renewable energies is intermittent (there is not always sun or wind, droughts, etc.), so the supply of electricity from these sources is also variable. Research is therefore continuing on how to store this energy in order to avoid having to resort to non-renewable energy sources.

Here you can find a very entertaining and easy-to-follow video that summarizes all this information.

2.4.2 Types and characteristics of Non-Renewable Energies.

Most of the non-renewable energy sources are fossil fuels: coal, oil and natural gas, with carbon being the common element in all these fuels.


COAL


OIL


NATURAL GAS

All fossil fuels were formed in a similar way hundreds of millions of years ago, even before the dinosaurs, and therefore, once they have been consumed, we will not be able to generate them again.

Advantages:

- Fossil fuels are a valuable source of energy.
- They are relatively cheap to extract.
- They can also be stored, channeled or sent anywhere in the world.

Disadvantages

- Non-renewable energy sources are located in certain places (Persian Gulf, United States, Venezuela, Russia) and the countries where these deposits are found trade with these natural resources and impose their economic conditions, sometimes impossible, on other poorer countries or communities. According to the UN, more than 790 million people still do not have access to electricity.
- The burning of fossil fuels is harmful to the environment and is the main cause of climate change. When coal and oil are burned, they release particles that pollute the air, water and land.

A transition from fossil fuels to renewable energy is therefore essential if we are to achieve economic prosperity for all and for all, and a nature safe from the crisis caused by man's action and involvement in climate change.

2.4.3 Nuclear energy

Nuclear energy will be dealt with separately because there is currently a great debate on whether it is considered renewable energy or not.

Nuclear energy is obtained from the fission or fusion of uranium and plutonium atoms. These materials occur naturally in some terrestrial rocks, and do not come from fossilization as coal does. This might lead us to believe that it is therefore renewable.

However, the tons of uranium and plutonium that man consumes to produce electrical energy do not regenerate themselves, and in the long term, these materials could be depleted, which is why some argue that it is non-renewable.

Another aspect that is also discussed with regard to nuclear energy is whether it is clean and sustainable energy, as most nuclear reactors only emit water vapor into the atmosphere; no CO2, no methane, no other pollutant gas that aggravates the climate change crisis, but that is something we will see in the next section.

2.5 Environmental Impact of Energy

We have already seen how electricity is generated and how renewable energies offer many more advantages than non-renewable energies. However, in this section we are going to look at how energy generation and consumption have an impact on the environment and reflect on this.

From an environmental point of view, the important thing is that the energy sources we use are clean and sustainable, and it is clear that non-renewable energies are dirty and depleting. The CO2 emissions we put into the atmosphere when we generate electricity from coal, natural gas or oil have a major impact on the climate change we are already experiencing. Numerous experts point to the Mediterranean region as one of the areas of the planet most vulnerable to climate change, accelerating the deterioration of resources essential to our well-being such as water, fertile soil and biodiversity, and threatening the quality of life and health of people.

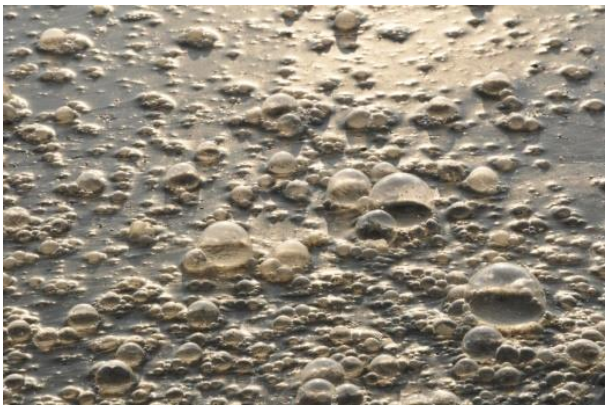
It is therefore essential to replace fossil fuels with renewable energies. Does this mean that all renewable energies are clean and "green"?

2.5.1 Clean energy

As we have already seen when talking about nuclear energy, there are different opinions on when to consider clean energy. Of course, these opinions depend on the large number of interests of all kinds at stake, for let us not forget that energy is the foundation of our economic development and of our present and future well-being.

For some countries and companies, Clean Energy is any energy that emits low CO2 emissions into the atmosphere, more specifically, that has an emission rate of no more than 100 kg/MWh, regardless of the rest.

On the opposite side are those who defend that clean energy is only that which, in addition to coming from renewable sources, does not generate pollution, not only atmospheric pollution but of any other type (water, soil, etc.) and that in its generation and transport processes, ecosystems and human rights are respected to a large extent.



From our point of view, we will only be aware of the seriousness of the problem if we assess the problem in its entirety. In other words, the **environmental impact must be assessed:**

- By producing and consuming energy,
- In the extractive activities that certain energy sources require,
- In transport prior to use,
- In the treatment processes to which the different energy resources must be subjected before being used,
- In the waste they generate.
- Respect for human rights.

In the same way, we believe that it is necessary to study not only the sources of pollutant emissions into the atmosphere, hydrosphere and soil, but also to follow them and analyze them up to their final destination in the ecosystems and in mankind.

2.5.2 Effects on the environment

In the atmosphere.

The atmosphere is made up of a mixture of gases: nitrogen (78%), oxygen (21%), carbon dioxide (0.04%) and other gases in small proportions, such as methane, helium, neon, etc. Fossil fuels emit a large number of greenhouse gases (carbon monoxide and dioxide, sulphur dioxide, etc.) which, by altering the composition of the atmosphere, alter the climate and cause acid rain and smog.

This is the most serious of the consequences, from which all the others that follow are derived:

In the hydrosphere.

The hydrosphere consists of oceans and seas, saltwater and freshwater lakes, rivers, marshes and wetlands, groundwater, glaciers and ice caps, making up 74% of the Earth's surface.

The main polluting effects of energy production on the hydrosphere derive from:

- The effects of acid rain on inland waters.
- The effects of mining and other extractive activities.
- Thermal pollution of inland waters by power plants (atomic and thermal).
- Dumping of nuclear waste into the oceans.
- Spills (accidental or otherwise) of oil occurring during transport in:

- Maritime disasters.
- Pipeline failures.
- Intentional discharges from tank cleaning, etc.

On the ground.

Soil degradation processes induced by activities related to energy production include:

- Acidification.
- Contamination by heavy metals and organic compounds (hydrocarbons).
- The extraction of minerals such as coal (fossil energy), uranium (nuclear energy), quartz (solar energy), which entails the total destruction of entire ecosystems.

In the biosphere.

The effects on the biosphere can be classified as follows:

- On vegetation cover. Desertification, disappearance of plant species
- On animals and especially humans that makes them more vulnerable to other environmental factors such as diseases (bronchitis, asthma, allergies, cancer) and parasites.

2.5.3 Other forms of environmental impact

In addition to the above, there are other environmental impacts of energy production. They are perhaps less important globally, but they often have a great effect at the local level.

Not even those known as renewable, green or clean energies are exempt from certain environmental costs. Among them we can highlight:

- Those resulting from the construction of large hydroelectric power stations, which sometimes entails the disappearance of villages and the diversion of rivers.
- The impact on the landscape and birdlife that wind farms can create.
- The problems of deforestation that uncontrolled use of biomass can generate.
- Problems caused by power lines.
- The conversion of natural areas into landfill sites for electrical components, radioactive waste, accumulator batteries, etc.
- Those resulting from nuclear accidents or warlike use of energy.

Against this backdrop, we should not be discouraged but rather the opposite. Take action and make responsible energy consumption based on the following principles:

- It reduces the amount of energy consumed.

- Use energy efficiently, i.e. use energy that has less impact on the environment and improves the quality of life for everyone.

Of course there are many small gestures we can make in our daily lives and we invite you to reflect on them.

We hope that after reading this didactic unit, you have understood where the energy that we use every day comes from and that it has helped you to remember that with simple gestures and actions we can consume less energy. However, we know that you will still be asking yourself many questions as a hairdresser who needs electrical energy for your profession. We invite you to further explore this topic in the level 2 didactic unit: "Energy in the Hairdressing Salon".

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3. Water

- **Introduction**
- **Water - a resource threatening to become scarce**
- **How can we save water with simple steps and why should we?**
- **Water pollution in general. Ocean clean-up project**
- **Waste water purification: who does it and how it happens?**

Goals: In this chapter we will look at water in general as an important natural resource vital to all beings as well as economies and at the impending water scarcity. We will also examine water pollution and why it can harm the world's limited clean water supplies. Next to the threats we will find out what can be done about water pollution and unnecessary water waste by everyone.

Objectives:

- Learning facts and figures about water
- discussing the causes of impending water shortage and water pollution
- getting familiar with ways to save water in our households and minimize water pollution
- introduction to some smart water cleaning projects and learning about water purification

Introduction

We start with a general definition of what water is. According to Merriam-Webster, water is a liquid that comes down from the clouds as rain, makes up streams, lakes and seas, and is a major constituent of all living matter and that (when it is pure) is an odourless, tasteless, slightly compressible liquid with the formula H2O (indicating that each of its molecules contains one oxygen atom and two hydrogen ones). It looks bluish in thick layers, freezes at 0° C and boils at 100° C, has a maximum density at 4° C and has a high specific heat. Water is a good solvent but a poor conductor of electricity.

Image by onlyyouqj on Freepik

Water is also an essential natural resource, the main constituent of Earth's hydrosphere and the fluids of all known living organisms where it acts as a solvent. It is vital for all forms of life, even

though it provides no food, energy or organic micronutrients. Water covers about 71% of the Earth's surface, most of which is in seas and oceans (about 96.5%).

On our planet a water cycle exists in which seawater evaporates, condenses in the atmosphere and falls back as precipitation (rainfall), after which rivers and groundwater return it to the sea. Seawater is also called salt water because many salts are dissolved in it. When seawater evaporates, the salts remain in the sea, that is why precipitation does not contain salt, this is called fresh water, the water humans can use.

Of all water on Earth 97% is found in oceans and seas as salt water. The rest is subdivided into fresh and saline groundwater (23,300,000 km), ice (24,000,000 km), surface water (lakes and rivers, 190,000 km^3) and water vapor in the atmosphere (14,000 km). The proportions may vary slightly due to several factors, including the climate at a certain location.

People can only use fresh water. The tap water we have easy access to in most European countries is of such good quality that you can drink it without extra filtering directly from the tap. In some countries it's better to buy drinking water instead of using the tap water or use special filters.

Interesting fact: Can you imagine that a household uses around 130 litres of perfectly clean drinking water to do the dishes, operate a washing machine or flush the toilet? The good news is that this amount has decreased since 2003 and this has to do with the household appliances (like dishwashers or washing machines) becoming more and more economical in a way that they use less water. We are wasting quite some good quality drinking water while 40 percent of (Sub-Saharan) Africa is completely without access to clean water.

Also, most industries use water – it is essential for the economy of every country. Not every industry is careful about what kind of waste substances that come into the water. According to the Dutch newspaper Trouw, hairdressing industry (salons as well as cosmetics and hair colour manufacturers) belong to the top 10 of most polluting industries. This is due to the numerous chemicals that are used in the treatments like dying or perming of the hair. These oftentimes harsh chemicals when rinsed off the treated hair flows directly into the sewage. Hardly any salons filter these waste waters yet. This means that if we want the water supplies of our planet to stay accessible to as many people as possible and have our waters and the oceans clean and vital, the hairdressing industry among others should minimize its impact on the world water resources. And the hairdressing students - the beauty professionals of tomorrow - should learn how to do this.

Image by aleksandarlittlewolf on Freepik

3.1 Water - a resource threatening to become scarce

Just some alarming facts and figures to start with: over the past 40 years, the world's population has doubled and the use of water has quadrupled.

Today around 4 billion people, which is nearly two-thirds of the world's population, experience severe water scarcity. This happens during at least one month of the year.

According to the Global Water Crisis Report by UNU-INWEH, up to 40% of the world's population will be living in seriously water-stressed areas by 2035.

If we do not change our behaviour, by 2040 there will be not enough water to quench the thirst of the world population and keep the current energy and power solutions going.

By 2050, the world population will have grown to 9.7 billion people. Water demand is expected to grow by 55 percent, including a 400 percent rise in water demand for manufacturing purposes.

Water scarcity is a big and ever-growing problem in the world. It has to do with the geographic and temporal mismatch between freshwater demand and availability. It means that a lot of places (the North of Africa and lots of regions in Asia) have trouble getting access to fresh water. This can be due to physical or economic reasons. Physical water scarcity means there's just not enough water available in the region to satisfy all the needs of the ecosystem. Economical water scarcity means that there is no sufficient infrastructure to make water available there where it is needed.

The main reasons for the growth of water scarcity on the planet:

- the growing water demand due to population growth,
- higher living standards with increasing water demand,
- the dietary consumption of more animal products,
- expansion of irrigation in agriculture.

Moreover, deforestation, climate change (a combination of floods and droughts), water pollution and wasteful water use (like flushing the toilet or operating a washing machine with clean fresh water) can result in a shortage of water supply.

For example, even in the Netherlands, the famous 'water country', in the last couple of years there's been an impending water shortage, especially due to hot summers.

Question: what problems/challenges does humanity face in case of water shortage / water scarcity? Can you think of different aspects of our life we need water for?

3.2 How can we save water with simple steps and why should we?

Water saving tips

Since water is one of the vital resources threatening to become really scarce as mentioned before, it is of paramount importance that we all do a little bit our best to save water wherever possible. With these handy little steps you can save water in and around your house.

1. Use a bowl filled with water when washing vegetables, fruit or dishes. You can then use the waste water to water your plants.

2. A water-filled jug from the fridge will come handy if you need a cool drink.

3. In order to prevent wasting up to nine litres of water a minute, do not forget to turn off the tap when you brush your teeth.

4. A full load of your washing machine or dishwasher will save a lot of water. Most new models of washing machines and dishwashers use considerably less water than the older versions.

5. Enjoy a shower instead of a bath whenever possible. A five-minute shower means using of some 40 litres of water, while taking a standard bath quickly goes up to least the double.

6. Use the water-saving buttons in your toilet flush system. This way you can realize a saving of between 1 to 3 litres of water each time you flush your toilet.

7. Using a watering can in the garden instead of a sprinkler or a hosepipe. Garden sprinklers and hosepipes left running waste up to 500 and 1000 litres of water an hour unnecessarily.

8. Think about fitting a water butt to collect rainwater off your roof. Next to being better for watering your plants, using rainwater in the garden cuts down on the amount of clean water you use.

9. Check your property for leaks in your internal plumbing regularly.

10. Try shortening your regular shower routine by 2 minutes (make it for example 5 instead of 7 minutes). Also making your water temperature 1-2 degrees lower will help you save some energy and is good for your health (if you have heard about the Ice Man Wim Hof, then you know that. Otherwise look up the Wim Hof method online!)

These tips can help you save money as well, no matter whether you have a water meter or not. Also, shortening your shower routine will lower your gas / electricity bill and reduce the amount of greenhouse gases getting into the atmosphere not only from heating your water but also from treating and purifying the wastewater back into being usable and clean.

3.3 Water pollution

- Polluting one of our most essential resources - water
- Causes of water pollution
- What can we do to prevent or minimize water pollution?
- Plastic soup and the Ocean Clean-Up Project

Knowledge activation: scan this QR code and watch the video [appr. 3 min]

Video: https://youtu.be/Om42Lppkd9w

Question: why do you think water pollution is a big problem for humanity?

QUOTE: *"Thousands have lived without love, not one without water"* (British poet W. H. Auden)

Despite us knowing how essential water is for our lives, we keep polluting it. Our rivers, lakes and seas are drowning in chemicals, waste, plastic and other pollutants. Some 80 percent of the world's wastewater is dumped—mostly untreated—back into the environment, polluting rivers, lakes and oceans.

Water is a universal solvent which makes it very vulnerable to pollution of all kinds. Due to this quality of water we have our favourite lemonades and blue waterfalls. But also toxic substances from farms, towns and factories dissolve easily into and mix with it, causing water pollution.

Causes of Water pollution

Agriculture

The agricultural sector is not only the biggest consumer of global freshwater supplies, with farming and livestock production using about 70 percent of the earth's surface water resources, but unfortunately it is also a serious water polluter. Around the world, agriculture is the leading cause of water degradation. During rainy days fertilizers, pesticides and animal waste from farms and livestock operations wash nutrients and pathogens (like bacteria and viruses) into our waterways. Nutrient pollution, caused by excess nitrogen and phosphorus in water or air is the biggest threat to water quality worldwide and can cause algal blooms (see picture below), a toxic soup of algae in the colours blue and green, that can be harmful to people as well as animals.

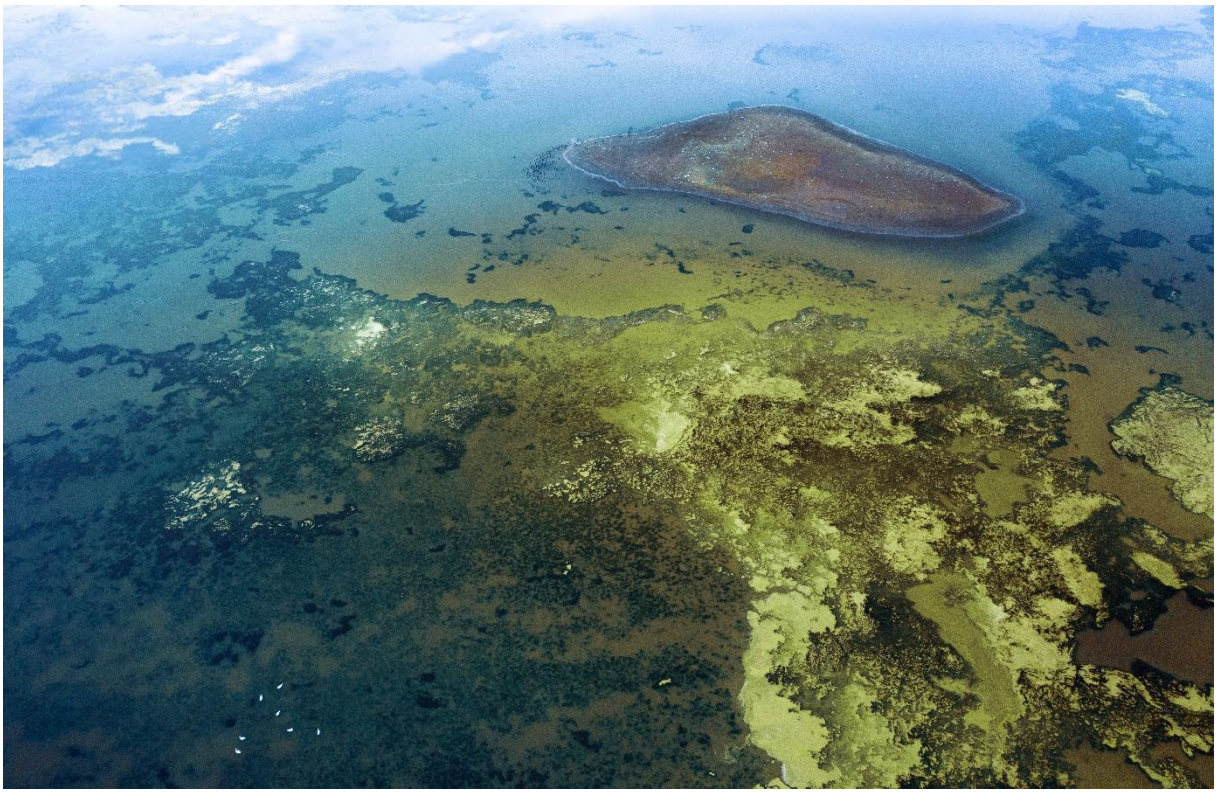

Image by wirestock on Freepik

Sewage / wastewater

Water originating from our showers, sinks and flushed toilets and ending as sewage is called wastewater or drain water. The same goes for the rinse off of the industrial or commercials activities (often containing solvents, metals and toxic sludge). It can also be stormwater runoff occurring when rainfall carries road salts, oil, grease, chemicals and debris from water-resistant surfaces into our waterways.

Oil pollution

Every day gasoline is dripping from our cars and trucks into the water, causing the oil pollution of our waterways. At sea, tanker spills account for about 10 percent of the oil in waters around the world as well as regular operations of the shipping industry.

Radioactive substances

Another cause of water pollution is radioactive which is generated by activities such as uranium mining, nuclear power plants and the production / testing of military weapons, as well as by universities and hospitals that use radioactive materials for research and medicine. Radioactive waste can persist in the environment for thousands of years, making disposal a major challenge.

Other types of water pollution are solid waste plastic pollution (see 'the plastic soup' item to learn more), toxic waste, thermal pollution and sediment resulting from soil erosion or construction activity that can be carried into water bodies by surface runoff.

What do you see as one of the major risks for water pollution in your region? And in hairdressing? Which of the 4 causes described in detail above does this risk belong to?

What Can You Do to Prevent or Minimize Water Pollution?

Of course as we could see the biggest pollutants are industries, agriculture and other large organisations. But we are all accountable to some degree for today's water pollution problem. Luckily, here are simple ways you can prevent water contamination or at least minimize your contribution to it:

- Learn about the unique qualities of water in your area. Where does your water come from? Is the wastewater from your home treated? Where does stormwater flow to? Is your area currently in a drought?
- Minimize your plastic consumption and reuse or recycle plastic whenever you can.
- Think of disposing of chemical cleaners, oils and nonbiodegradable items in a proper way, keeping them from going down the drain.
- Take care of your car so it doesn't leak oil, antifreeze or coolant.

- Don't flush your old medications! In order to prevent them from entering the waterways, it is best to dispose of them into the trash or a specials chemical waste station.

- Be mindful of anything you pour into storm sewers, since that waste often won't be treated before being released into local waterways. If you notice a storm sewer blocked by litter, clean it up to keep that trash out of the water. In that way you will also help prevent troublesome street floods in a heavy storm.

- If you have a dog, be sure to pick up its poop

Find more quotes that have to do with the importance of water for our lives.

Plastic soup and the Ocean Clean-Up Project

Have you ever heard the expression 'plastic soup'? Plastic soup is a term used to name the pollution of the world ocean with plastics, ranging in size from large original material such as bottles and bags, down to the so-called microplastics formed from the fragmentation of plastic material. Marine debris is mainly human garbage float ing on or suspended in the ocean. 80% percent of marine debris is plastic.

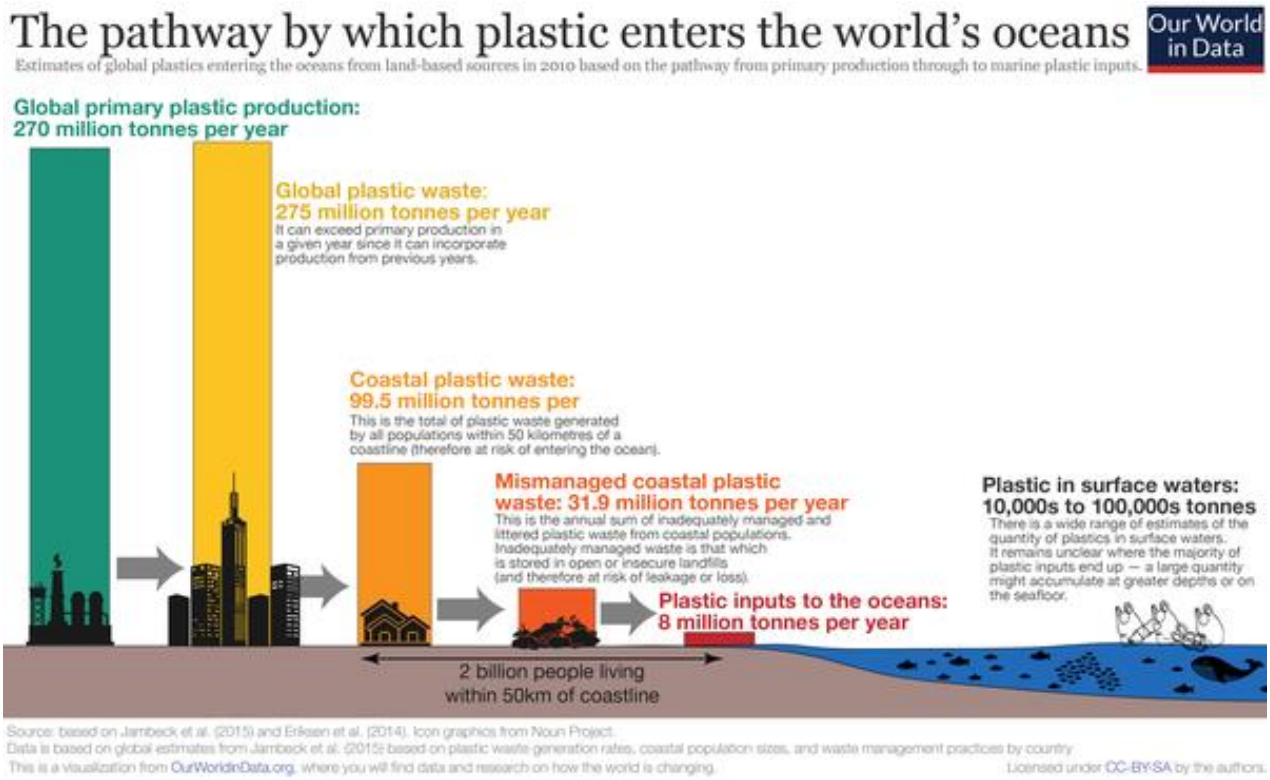

Image source: Wikimedia 'The pathway by which plastics enters the world's oceans'

Why is plastic soup dangerous?

Next to the harm to the wildlife (sea animals getting entangled in plastic, animals eating plastic and getting too full stomachs but no energy and eventually dying, plastics having entered the entire ecosystem, also being found in the human bodies and even babies), humans get plastic into their bodies which can pose some serious health issues on them.

The biggest health issue with (micro)plastic for the humans are the following: getting through the rest of the food chain and the environment into our bodies, the plastic particles are so small that they even get into all organs through the blood stream. This results is inflammatory reactions in the body and endocrine disruption and lowered fertility. These issues are primarily caused by flexibility agent bisphenol A (BPA) and plasticizers. To know what other health risks there are more research is needed.

Image from Freepik: Plastic Soup and potential damage to the sea wildlife

Optional: Search the web for some examples of wildlife / sea life having trouble with plastic soup. What animals are these? In which way are they threatened by the plastic in the ocean / environment? (Tip: the website of the Plastic Soup Foundation)

Ocean CleanUp project

In order to beat the Pastic Soup problem a Dutch foundation - Ocean CleanUP project - has been set up. It is a non-profit engineering environmental organization based in the Netherlands, that develops technology to extract plastic pollution from the oceans and intercept it in rivers before it can reach

the ocean. Founded in 2013 by Boyan Slat, a Dutch-born inventor-entrepreneur of Croatian and Dutch origin, who now serves as its CEO, the organisation has been in operation ever since.

Upon extensive prototyping and testing in the North Sea they have installed their very first prototype in the Great Pacific Garbage Patch. Also their river technology, called the Interceptor, has been put into action in two locations in 2019 and later in 2020. In 2022, the first Interceptor Original deployed in the United States is installed in Ballona Creek near Los Angeles, California. The organization also conducts scientific research into oceanic plastic pollution and its effects on the environment, wildlife and humans.

Image from https://theoceancleanup.com/media-gallery/, copyright by The Ocean CleanUp Project

Optional: Study the website of the Ocean CleanUp Foundation. What do you think made this project successful in creating a device to scoop the plastic out of the oceans which some previous projects / attempts failed to do?

3.4 Wastewater purification

Water purification is the removal of substances from the water. It comes in different degrees. Although water has a self-cleaning capacity, if water is too heavily polluted, additional artificial water purification processes are required so that fauna and flora in the water can recover.

Disposals of wastewater requires special equipment, permits and expertise. Wastewater should be discharged of in accordance with all the local legal guidelines. Equally important is where and how the wastewater flows.

Some examples are:

- Drinking water pipes
- Booster pumps
- Drinking water treatment
- Buffering drinking water
- Desalination of seawater and making it drinkable
- Boiling and collecting the evaporated pure water
- Pumping seawater through membranes that pull out the salt (osmosis)
- Hydroloop: recycling water is the efficient and affordable way to use less water. Water is then recycled at the place where it is used.

Water purification plants are establishments that make sure our waste waters get purified.

Look up information about the experiments on the use of pollutant-extracting plants to decontaminate water

Optional: Study the principles of water purification by the award-winning company Hydraloop

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4. Waste

Goals: introducing the concept of waste and waste management in general, understanding why waste is a growing world problem and what can be done about it. Touching upon the notion of circular economy.

Objectives:

- Find out facts and figure about waste and why it is a growing problem
- Ways of minimizing the waste with reduce – reuse – recycle principle
- Getting acquainted with concept of circular economy and waste as new raw material
- Learning to monitor the use of microplastics

Introduction

The world generates 2.01 billion tonnes of municipal solid waste annually, with at least 33 percent of that—extremely conservatively—not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages 0.74 kilogram but ranges widely, from 0.11 to 4.54 kilograms. Though they only account for 16 percent of the world's population, high-income countries generate about 34 percent, or 683 million tonnes, of the world's waste.

It is very important for the whole world to become more aware of the importance of the environment and what we do with our waste. Research has shown that in Europe, for example, we are still not doing enough to maintain the environment to be sustainable for the long term future. In Europe only each household produces more than 16 tonnes waste per year. Only as little as 40% of this waste (this is primarily metal, woods, glass and plastics) is being recycled. The rest is placed in landfills or burned. In some countries up to 80% still goes to the landfill.

Obviously, if we do not want the world to turn into one gigantic landfill, we have to do something about this.

4.1 Why is waste a growing problem?

The predicted growth of global waste generation is more than double of the expected population growth: by 2050 it may grow to 3.40 billion tonnes. Interestingly, the lower the income of the population, the more the waste generation is expected to grow. While in higher-income countries the daily per capita waste generation is expected to increase by 19%bu 2050, in lower-income countries this increase is projected to be 40% and more. Taking into account the predicted world population growth in the coming years, the solid waste generation is possible to become an even bigger and more alarming problem.

4.2 Reduce – reuse – recycle and how to do it wisely

In her book 'The Hidden Impact' and on the website the Dutch environment enthusiast Babette Porcelijn tells us how we can rethink our lives into making them 'greener' and eco-friendlier.

You can reduce your impact on the environment in three ways: choosing better alternatives, searching for other solutions and sometimes a little less is more. Better, Other ways, Less: B-O-L.

BETTER

Making something 'better' means making polluting things cleaner. This principle has worked well in the recent years. For example, airplanes and greenhouses have become more energy efficient and less polluting. 'Better' is a step on the way to 'good'. Useful, but still in progress.

OTHER WAYS

By 'other ways' Babette means a sustainable alternative. And there are already many of them. The train (using green electricity) instead of the airplane, solar panels instead of grey electricity and legumes instead of meat. 'Other ways' can slowly but steadily lead to a system change.

LESS

Half of the Dutch people have difficulty keeping their weight healthy and their houses are full of stuff. Put that next to the two biggest impacts on the environment: stuff and eating meat! Less consumption makes the most sense. And maybe a little less will make us a little happier. The best part is, it is very easy. You can start today!

BOL (better-other-less) model for the 3Rs

	Things	Food & Drinks	Mobility	Living
Better	thrift store, 2nd hand, recycled	Seasonal & local foods/crops	No car (using the shared car options)	Green electricity, small house, well insulated
Other	No gifts but food/drinks/experiences for my birthday	Mostly vegetarian/vegan	Public transport, bike	Solar panels, solar boiler
Less	I buy almost nothing, only what I really need	Keeping leftovers, eating from smaller plates	Working close to home, no more flying	Short showers, heating pre-programmed, draft strip

The examples of the BOL-principles of becoming 'greener'.

In order to keep as much material out of the landfill as possible, it is important for each of us to do our part. The 3 Rs of waste management — **Reduce, Reuse, Recycle** – can be used to put this simple plan into action.

Image by rawpixel.com on Freepik

1. Reduce means to cut back on the amount of trash we generate (think of using less shampoo or conditioner while washing your customer's hair, using a solid and reusable lunch box instead of plastic sandwich bag to reduce the use of plastic)

2. Reuse means to find new ways to use things that otherwise would have been thrown out (for instance, arrange a garage sale with the contents of your wardrobe you do not use so that others can enjoy the items or bring your own textile bag to the grocery store)

3. Recycle means to turn something old and useless (like plastic milk jugs) into something new and useful (like picnic benches, playground equipment and recycling bins). In that way we can make waste the new raw material!

4.3 What is circular economy?

In the current economy, the production process is linear, meaning that we take resources and raw materials from the Earth, manufacture products from them and eventually throw them away as waste. Unlike this, in circular economy, waste is stopped being produced in the first place.

The circular economy is based on three principles, which are driven by design:

- Elimination of waste and pollution
- Circulation of products and materials
- Regeneration of nature

A transition to renewable materials and energy lies at the core of circular economy. It makes sure the economic activity is disconnected from the finite resources consumption. This system is resilient and good for business, people and the environment.

Global challenges like climate change, biodiversity loss, waste and pollution can all be tacked by the system solution which is circular economy.

Image by Freepik

1. If you want to learn more about the circular economy and examples of it, watch this YouTube video about circular economy (about 10 minutes): https://www.youtube.com/watch?v=NBEvJwTxs4w&t=310s.

2. Check out the website of the circular Urban Development in Amsterdam De Ceuvel. Name at least 3 examples of sustainable and circular solutions they make use of at De Ceuvel

4.4 How can waste be new 'raw material'?

The principles of circular economy allow waste to become new raw material. There is no longer the line (as in the linear economy): produce, consume and then throw away. During the design phase the whole life cycle of a product is carefully worked out, especially preventing the product from becoming waste at the end – in this way, production concentrates not only on saving raw materials, environment and CO2 reduction, but also on innovation. This means that most of the products used by people will be reused again and again. Broken products will be repaired. And if that is no longer possible, new products will be made from them. Products and raw materials are thus reused as much as possible.

Cars and drills, for instance, are products that are used less frequently. By sharing them with others they do not have to stand still, are used more intensively, meaning less of the products and thefore of the raw materials needed for their manufacturing will be used.

Also the environment is treated responsibly. For example, by preventing garbage on streets or in the natural environment. Most governments are already taking steps in this direction by, for instance, banning free plastic bags. About 80% of consumers say they often or always take their own bag while doing groceries instead of buying a single use plastic bag from the shop.

A circular economy that is operational is as much the responsibility of citizens as it is of industry and governments. For each and everyone of us, the consumers, choosing for the more sustainable and ethically produced options of products and services should become the new norm. Consumers can contribute to a circular economy by using things longer, repairing them or taking them to the recycling shop. This good behaviour should not only be stimulated and supported by the government, but also integrated into education.

4.5 Beat the microplastics

Since microplastics are potentially very dangerous for the health of the wildlife as well as us humans, being aware of whether or not we get exposed to them through the products we consume is essential. There is a handy tool you can use for checking if the products you buy or use contain the microplastics. By monitoring this, you can opt for alternative. By consuming less products containing microplastics we as consumers will force the manufacturers to produce safer products, with less or no microplastics in them.

Download the Beat the Microplastics / Microbead app and find out if there are any microplastics in **the products and packages you use / buy. In this way you can decide which products you want to purchase** for use in your salon or your household. Try scanning at least between 5 and 8 products. Start scanning!

You can find it here: https://www.beatthemicrobead.org/download-btmb-app/ or scan the Qr-code

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5. Raw materials

SUMMARY

1. Definitions and classifications
2. Raw materials in products and equipment: where is what.
    a. Furniture
    b. Equipment
    c. Cosmetic products

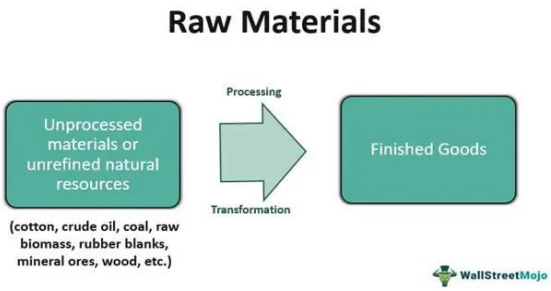
Introduction

The objective of this module is to trace the perimeter within which to reflect on the use of raw materials in a beauty salon. The topic could be extremely vast and branched, but we will limit ourselves to analyzing it fundamentally within three categories: furnishings, equipment and products.

5.1 Definitions and classifications

Raw materials are materials or substances used in the primary production or manufacturing of goods. Raw materials are commodities that are bought and sold on commodities exchanges worldwide. Businesses buy and sell raw materials in the factor market because raw materials are factors of production.

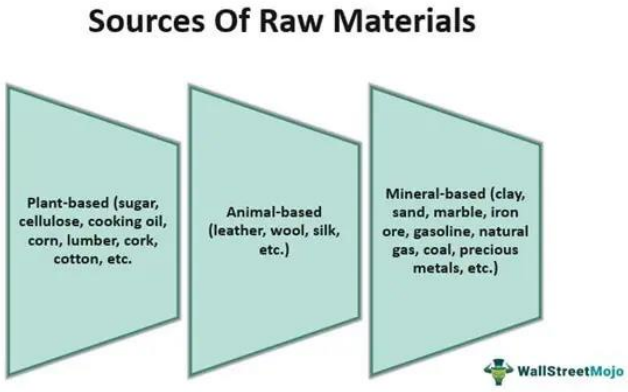
Raw materials are used in a multitude of products and can take many different forms. Raw materials are the input goods or inventory that a company needs to manufacture its products. For example, the steel used to manufacture vehicles would be a raw material for an automobile manufacturer.



Raw materials are often related to natural resources. For this reason, manufacturing companies may be at the disposal of mother nature regarding the availability to secure raw materials. In the same light, manufacturing companies may not want to directly invest in extracting the raw materials. For example, consider how a company that relies on oil or plastics often does not own the drilling rig that extracts the raw materials from the group.

Raw materials can be classified in several ways, but one common classification is the nature of how the good is extracted. These types include:

- **Mined raw materials** extracted from the earth, such as ores, stones, metals, minerals, lime, sand, soil, oil, and coal.
- **Plant-based raw materials** come from trees or plants, including fruits, nuts, flowers, vegetables, resins, wood, cotton, and latex.
- **Animal-based raw materials** are extracted from animals such as milk, meat, furs, leather, and wool.



Raw materials are often segregated into these three categories as each type often entails very different investments to procure the raw materials. For example, the operations of a farm are substantially different from an oil drilling rig; companies that require both raw materials must be mindful of how to most efficiently source the materials.

"We do not inherit the earth from our ancestors, we borrow it from our children." (Native American proverb)

Thinking activation

- What are the consequences of using non-renewable resources in excess?
- What is the impact of over-exploitation of natural resources on the environment and biodiversity?
- What role can governments, industries, and individuals play in ensuring sustainable use of raw materials?

Even **water** can be thought of as a raw material that is used in a wide range of products and processes. Water is used for many purposes, playing a central role in all activities that make use of it, direct or indirect. In recent decades world water consumption has increased almost tenfold: about 70% of the water consumed on Earth is used for agricultural use, 20% for industry, 10% for domestic use.

The amount of water used in industry depends on many factors, such as the type of activity and the technologies used. In general, it is possible to identify three different ways of using water: as a raw material in the production process, for the cooling of machinery, and for the washing of plants.

The industrial sector is expanding, especially in developing countries that often make use of obsolete and polluting technologies: the water used in industrial production cycles is not always returned to nature in the same conditions.

Civil uses of water include those for human nutrition, food preparation, body cleaning, and domestic and public environments. In this case it is not only the amount of water that is made available to people, but also its quality. In recent years worldwide, the consumption of water for civil use has more than doubled as a result of demographic growth but also an increase in the consumption of individuals.

"We never know the worth of water till the well is dry." (Thomas Fuller)

Thinking activation

- How does the overuse of water in one region impact the water supply in another region?
- What are the long-term consequences of using groundwater faster than it can be replenished?
- In what ways can individuals reduce their daily water usage to help protect this essential resource?

FACT *Using greywater, which is wastewater generated from sources such as laundry machines, sinks, and showers, can be treated and reused for non-potable purposes such as toilet flushing and irrigation. This can significantly reduce the amount of freshwater needed for these purposes and decrease the overall demand for water, making it a more sustainable use of resources.*

5.2 Raw materials in products and equipment: where is what

FURNITURE

Furniture is a significant investment in the process of building a salon. While aesthetics takes centerstage when deciding on the furniture, budgets need to be factored in as well. Understanding what makes a quality piece of furniture requires a deep dive into what raw materials can be used and what are the benefits of these materials. Raw materials like wood, cane, metal, leather, and fabrics are most commonly used for contemporary furniture though one is only limited by one's imagination while being creative.

Below we will just give some introductory information to help us get an overview of the problem. In module 2 we will go into detail also analyzing the characteristics and problems related to the use of individual raw materials.

EQUIPMENT

Almost the same goes for the equipment for which, it must be added, is necessarily still widely used one of the most discussed materials of the last decades for the great environmental impact that has and continues to have: plastic.

The main elements used to make plastics today are cellulose, coal, natural gas, salt, and crude oil, which are all found in nature. Various raw materials are used in the production of plastics, which are refined into ethane and propane. Heat is then applied to ethane and propane, resulting in a process known as "cracking," which transforms them into ethylene and propylene, respectively.

COSMETICS PRODUCTS

This is the most important topic regarding raw materials in every beauty salon. Cosmetics raw materials are based on natural, synthetic or extracted roles of raw materials, heating processes, stirring and emulsified mixed chemical substances. Cosmetic Raw Materials is based on various materials and ingredients perform in accordance to the chemicals and its key functionalities. These substances play a role in a number of cosmetic formulations, stable or given colour, aroma, and other characteristics, but they are vital. Recently, according to the trend of going back to the roots, simple components and non-invasive procedures has been popular in the cosmetics industry. It is the reason for the sudden interest in raw materials obtained directly from nature and used to produce natural cosmetics.

Natural cosmetics are products made from naturally-sourced raw materials such as mineral resources and ingredients of plant or animal origin. They are also the ones that are processed to the minimum hence are pretty much safe for the skin and are also equally effective as chemical-based products. With the recent shift to natural products, the importance of learning the raw materials used in a cosmetic product have doubled even more because some products that claim to be natural do contain some chemicals in the form of preservatives or additives in a minor amount.

When we say “natural raw materials”, the image that you might be getting will be of some leaves and flowers ground into a fine paste or powder and packed. Well, that’s not exactly what we mean by natural cosmetics. The raw materials are selected based on certain criteria because cosmetic and personal care products are meant to be safe for use and not cause any allergy or other harmful side effects. Not all of the natural substances are safe. They can be itchy, poisonous, reactive, too, and hence the safety of the raw material is the most important factor to be looked upon while selecting it for a cosmetic product.

Looking to sustainability, the availability of the raw material is another important point of attention in the selection of raw material. There are some natural substances that are on the verge of getting extinct or are available in limited quantities in certain regions. Hence, while selecting that particular raw material, care must be taken that it doesn’t get extinct or that its usage is causing harm to the environment or is unbalancing the ecosystem in any way.

Activity1 - Using an online collaboration board like Mural (https://www.mural.co/) or an online mind map creator, collaborate to create two different schemes:

a. FIRST ONE – A summary of the concepts learned in this module.
b. SECOND ONE – A brief vocabulary of most important key words you discovered during this lesson.

6. Management

SUMMARY

1. Who is a business manager?
2. Manager or owner
3. Management activities in a beauty salon

Introduction

The theme of the management of a hairstyle salon is certainly the element that generates and supports all the choices, strategies and activities that take place from when the entrepreneurial idea is born until the end of the business activity. As such it would require a very broad and thorough treatment even at a level that goes beyond the scope of this work. In this first module they begin to know some basic terms and then deepen, in the following modules, the knowledge of such a fundamental activity.

6.1 Who is a business manager?

A business manager is a supervisor who controls and directs the personnel and activities of an organization or a department. By adopting operational plans, carrying out performance evaluations, and supervising all daily activities, they strive to keep the business productive, efficient and organized at all times. Business managers invest time in finding any new chances that could aid in the company's expansion and competitiveness in the market, and they also set goals and targets to get there.

They collaborate closely with staff members every day to monitor all the projects they perform and identify any potential areas for improvement. The majority of the managerial duties they carry out involve hiring, developing, and terminating staff members. They also hold frequent one-on-one meetings with staff members to provide advice and guidance on how to improve in their roles and make sure team members have the tools they need to do their jobs well.

This is valid in general for any company, but depending on the business size, the characteristics of a manager change, and you need to develop skills often very specific. Let's analyze what happens in the beauty industry.

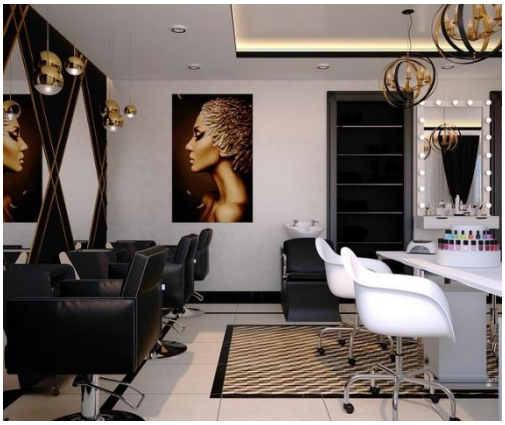
"The secret of business is to know something that nobody else knows." (Aristotle Onassis)

Thinking activation

- What is the role of management in achieving organizational goals?
- How does effective management contribute to the success of a company or organization?
- Can management be taught, or is it an innate skill?

FACT *The most successful companies are those that invest in creating a positive work culture. Studies have shown that happy and motivated employees are more productive and innovative, which leads to better financial performance and growth for the company. Thus, it is essential for managers to prioritize creating a supportive environment that promotes employee wellbeing and fosters teamwork, creativity and ongoing learning.*

6.2 Manager or owner



Salon Managers

Managers oversee the day-to-day operations of a salon. They hire, interview, order supplies and schedule employees. The salon manager is responsible for running the salon. It is the manager's job to identify problems and ensure the business thrives under their management.

Salon Owners

In contrast, owners of salons plan out the business and create it from the ground up. The owner works on building their business using marketing and advertising techniques.

In some cases, an owner acts as both owner and manager. Many owners decide that they are too busy to manage the salon and have managers on duty. They may also operate multiple salons and need a manager that is responsible for each salon.

6.3 Management activities in a beauty salon

Every beauty salon has its own needs and peculiarities, but we can summarize the attention that must have a manager (or an owner-manager) with these lists:

- Oversee daily salon operations
- Hire and train beauticians, as needed

- Organize employees' shifts, considering peak times and seasonality
- Scheduling appointments
- Order beauty products, like creams and essential oils and replenish stock
- Arrange for regular maintenance services for all equipment
- Apply hygiene practices across all beauty stations
- Ensure all beauty treatments meet high quality standards
- Maintain staff records, including salaries and working schedules
- Promote services, products and discounts on social media
- Receive payments from clients and track all transactions
- Keep updated records of costs and revenues
- Run online competitions and offer discount packages to attract new customers

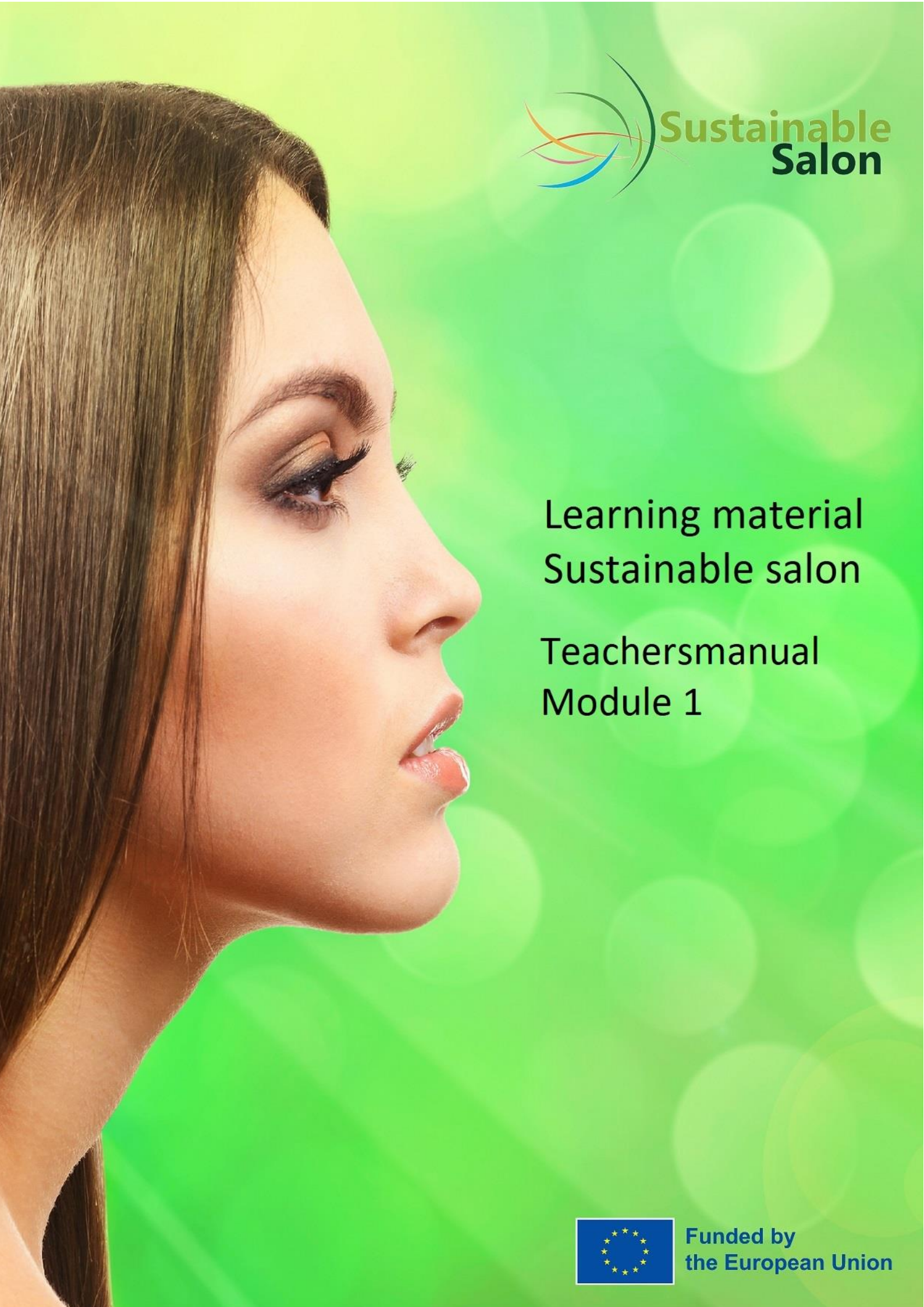
There are many other different instructions for the beauty salon manager job. You can google it to discover more, for example in the administrative field However, do not forget that the employee is still a human, not a robot who can cope with them alone and all at once. So, the manager, must collaborate with partners and workers to allow the team to work to the maximum of its possibilities.

To see how your business works the best idea is to use special software. There are many salon booking systems (CRM) in the current market. Select the one that offers easy optimization and business automation together with business analytics. Work with a CRM ensure to keep the control of the running business at every time avoiding to forget something important or not to menage a situation (or, worst, a client) in the best way.

Activity 1 - Using an online collaboration board like Mural (https://www.mural.co/) or an online mind map creator, collaborate to create two different schemes:

a. FIRST ONE – A summary of the concepts learned in this module
b. SECOND ONE – A brief vocabulary of most important key words you discovered during this lesson

Activity 2 - With an App or an online tool, create a graphic concept map of what you think are the activities of manager in a beauty salon. Try to create something that is graphically attractive. After the class will be completed, you will be asked to review this map according to the new concepts learned.



Sustainable Salon

Learning material Sustainable salon

Teachersmanual Module 1

Funded by the European Union

Authors: CIOFS-FP Lombardia, IES El Palo, Richtpunt campus Oudenaarde, ROC Amsterdam

Future skills for a better life in Sustainable Salons is a European project that aims to combine the sustainable ideas through education and training with innovative ideas within the sector.

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The project partners and associated partners within this program are:

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Project website: www.sustainable-salon.info

Index

Preface 4
1. Sustainability, Climate Change And Carbon Footprint 5
1.1 SUSTAINABILITY 7
1.2 CLIMATE CHANGE 9
1.3 CARBON FOOTPRINT 10
2. Energy and sustainability 12
3. Water 18
3.1 'Water - a resource threatening to become scarce' 18
3.2 'Water pollution and water purification' 20
4. Waste 22
4.1 Recycling Waste 22
4.2 Circular economy and waste as new raw material 24
5. RAW MATERIALS 26
6. MANAGEMENT 30

Preface

In front of you lies an extensive work of an enthusiastic team of experts that has taken a lot of effort, patience and time. In these learning materials on Sustainable salons we have tried to share our knowledge, expertise and first and foremost passion for a better and greener future for the hairdressing and beauty industry. In this preface you will learn more about how this work was developed and some useful tips on how to use it.

Within the project 'Future Skills for a Better Life in Sustainable Salons' 4 schools from Italy, Spain, Belgium and the Netherlands have worked on the learning materials together. Subject selection and division were motivated by the expertise of each school. The co-creation by 4 different organizations might have contributed to some differences in style and approach in the texts as well as assignments. We decided to leave it this way in order to preserve the original voice of every author and contributor to these materials. We, therefore, ask the reader's understanding for any possible perceived lack of homogeneity and hope you can find this enriching.

We have chosen to divide the materials in **3 modules**: module 1 deals with the general concepts of sustainability and environment, module 2 considers the same aspects but within the context of a hairdresser salon or a hairdresser's day-to-day operational practices. Module 3 is aimed at the salon manager(s) (students or apprentices) who concern themselves with the ins and outs of setting up and running a sustainable salon.

Each module consists of a Student manual which is meant for carrying out assignments provided by the teacher as well as self-study and knowledge deepening. In teacher's manuals, lesson plans can be found and descriptions of the goals, subgoals and objectives of each lesson, the approximate learning situation, the setting and the expected outcomes. In the teacher's toolkit manual the handouts, assignments, presentations, extracurricular activities and some module tests are included. We have made the materials far more extended than originally planned in terms of hours and coverage so that any teacher or instructor can draw from it as much as necessary.

The target group we had in mind while creating these materials is not only hairdresser students but also working hairdressing and beauty professionals and practically anyone who would like to deepen their knowledge of environmental issues and impact of hairdressing salons and activities on the environment. The materials are developed in such a way that they are adjustable to different schools', organizations' and students' needs and learning situations: from a full-scale school subject to a minor or a project week. It is also up to the teacher to choose or create a way of testing the knowledge based on the extended materials from the current manuals (some examples are given in the teacher's toolkit, for instance, in the 'Energy' section).

We truly hope you enjoy using these materials and find them helpful. We are happy to hear any questions, feedback or improvement suggestion from you!

Thank you very much in advance,

Warmly,

The Sustainable Salon Team

1. Sustainability, Climate Change And Carbon Footprint

General aim of the lesson

By the end of this lesson students will be aware of the concept “sustainability”.

Learning Outcomes

By the end of the lesson all students will be able to:

Knowledge

- give a definition on sustainability as a consumer, but also as an entrepreneur
- explain when a salon is sustainable or not
- understand a standard system for environmental care
- know the principles of the PDCA-circle
- define what climate change means
- explain why our planet is unhealthy
- explain why climate conferences are important
- define the sustainable development goals
- name the 3 key elements of the Paris Agreement
- give a definition for carbon footprint
- explain the use of the consumer footprint calculator

Skills

- give examples of being sustainable as a hairdresser
- make a list of actions to become more sustainable at home
- communicate with sustainable salons
- make a presentation on a salon focussing on sustainability
- use different scans on sustainability
- process the results of the scans on sustainability
- implement the principles of the PDCA-circle in a short and long term plan
- give consequences of climate change
- give evidences of climate change
- give examples of the most important goals of the climate conferences
- link sustainable development goals to a sustainable salon
- calculate your own carbon footprint
- reduce their own carbon footprint
- start up a campaign (poster, flyer) to make hairdressers aware of the impact of their carbon footprint and how to be as sustainable as possible

Attitudes

- Group discussion to share ideas and thoughts, awareness
- Evaluate outcomes
- Corner work
- Creativity
- Interviewing skills
- Communication
- Use of ICT
- Awareness on sustainability, climate change and carbon footprint

Additional Learning Outcomes

Here you can describe extra competences in terms of knowledge, skills and attitudes, as some students have a different work tempo or level of comprehension. It can also be applied to make a difference between the different VET levels of learning.

By the end of the lesson some students *will* be able to:

- **understand quotes on sustainability*
- **name the different work stations in a salon*
- **give ways of recycling salon waste by using a website*
- **recognising eco-friendly actions taken in a salon*
- **give sustainable modifications for the different processes in a salon*
- **make clear visuals of the results*
- **compare the results to one another*

By the end of the lesson some students *may* be able to:

- **give standards a salon must comply to to be considered sustainable*
- **thinking in a sustainable way as a hairdresser (pollution, customers, services, costs)*
- **put goals and short and long term plans into an advice to email to users of the scans*

Activities

Assignment p. 7: What do you think "sustainability" means being a hairdresser? Write down words or short sentences in a wordweb.

Assignment p. 7: Would you be able to give a definition to the word "sustainability"? Write it down in your own words.
Assignment p. 10: Make a list of actions you can use to become more sustainable at home. Students can use the text in the student's manual or the Internet or their own knowledge.
Assignment p 10: Work in pairs. Find a salon that is working in a sustainable way. Take an interview of 10 questions focussing on sustainability. Make a presentation of the information you got on sustainability from the interview. Present the presentation to the classroom.
Assignment p. 12: We will divide in 3 groups to take the scans and process the results.

- First group: You will take the awareness scan from 5 different teachers at 3 different hairdressing schools. You keep a good record of the results of the scans to create a clear overview in charts later.
- Second group: You will take the awareness scan in 15 different salons, preferably across the country. You keep a good record of the results of the scans to create a clear overview in charts later.
- First group + second group: You will take the extended scan in 5 different salons, depending on the need and the results of the awareness scan.
- Third group: You will take the scan on organization context of a sustainable salon from 5 recently opened businesses (up to 1 year) and 5 salons that are already open for more than 1 year, but less than 5 years and 5 salons that are open for more than 5 years.

Assignment p. 13: We divide into two groups.

- Group 1: Make up a short term plan to achieve the goals set in the discussion.
- Group 2: Make up a long term plan to achieve the goals set in the discussion.

Use the template in the teacher's toolkit, including the PDCA-principles.

Assignment p. 14: Look at the picture. Give a concrete example for the given changes. Fill in the grid from the teacher's toolkit.

Assignment p. 20: Read the article by clicking on the link https://www.theactuary.com/features/2021/10/07/unhealthy-planet-unhealthy-people or ask your teacher to get the text on paper. Answer the questions on the sheet.

Assignment p. 23: Check the website: https://www.un.org/en/climatechange/paris-agreement and name the 3 key elements of the Paris Agreement.

Assignment p. 24: Look at the small video on YouTube and answer the key questions on the sheet you'll find in the teacher's toolkit. https://www.youtube.com/watch?v=b6qPnu82OVU

Assignment p. 27: How big is your carbon footprint and what can you do to improve it? Underneath there are different tests you can do on the internet.

- https://footprint.wwf.org.uk/#/
- https://eplca.jrc.ec.europa.eu/ConsumerFootprint.html
- https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/
- https://footprintcalculator.henkel.com/en

Assignment p. 29: Let's finish of this chapter with a creative assignment. You will work in pairs. You will start up a campaign (poster, flyer) to make hairdressers aware of the impact of their carbon footprint and how to be as sustainable as possible. Make sure you tick of all the criteria given on the evaluation form in the teacher's toolkit.

Time schedule per lesson of 60 minutes:

1.1 SUSTAINABILITY

Time	What	How	Media used – teachers resource kit
LESSON 1			
10 5 5 5 15 20	1. Sustainability 1.1. The concept: What does "sustainability" mean? 1.2. When are you sustainable?	• Assignment: Brainstorm on the concept "sustainability" • Reading the text under 1.1. • Defining a definition • Reading the text under 1.2. • Assignment: Making a list of actions to become more sustainable at home • Assignment: Finding a sustainable salon + preparing an interview	• White board • Post-its • Student's manual • PowerPoint • Assignment papers • Computer/laptop • Cell phone or telephone

LESSON 2			
60	1.2. When are you sustainable?	• Assignment: Interview + preparing a presentation on the sustainable salon	• Assignment papers • Computer/laptop • Cell phone or telephone
LESSON 3			
60	1.2. When are you sustainable?	• Assignment: Presenting the different sustainable salons	• Computer/laptop • Beamer • Assignment papers
LESSON 4			
5 10 10 10 25	1.3. Scans on sustainability	• Reading the text under 1.3. • Looking at the 2 awareness tools for school and salon • Looking at the extended tool • Looking at the tool on the organization aspects on environment • Assignment in different groups: organization of the assignment - group forming + arrangement (dates, contact information, …)	• Student's manual • PowerPoint • Tools online • Assignment papers • Computer/laptop • Cell phone or telephone
LESSON 5			
60	1.3. Scans on sustainability	• Presenting the results of the different scans • Formulating a conclusion	• Computer/laptop • Beamer • Assignment papers
LESSON 6			
5 30 25	1.3. Scans on sustainability Evaluation on "Sustainability"	• Reading text on the PDCA-circle • Assignment in groups • Test on sustainability	• Student's manual • PowerPoint • Assignment papers • Test

Teachers Evaluation of the lesson

- Process evaluation; how did it go?

……
……

- Product evaluation; do the students master the content? Did they learn what it is about?

……
……

Time schedule per lesson of 60 minutes:

1.2 CLIMATE CHANGE

Time	What	How	Media used – teachers resource kit
LESSON 1			
5 20 35	2. Climate change 2.1. Definition 2.2. Unhealthy planet	• Reading the text under 2. • Assignment: Giving concrete examples for the given changes • Reading the text under 2.1. and 2.2	• Student's manual • PowerPoint • Assignment papers • Computer/laptop
LESSON 2			
20 15 5 20	2.2. Unhealthy planet 2.3. Climate conferences and sustainable development goals	• Assignment: Reading an article and answering questions • Reading the text under 2.3. • Assignment: Giving the 3 key elements of the Paris Agreement • Assignment: watching a video on YouTube and answering the key questions	• Student's manual • PowerPoint • Assignment papers • Computer/laptop • Connection to YouTube
LESSON 3			
15 45	2.3. Climate conferences and sustainable development goals Evaluation on "Climate change"	• Assignment: watching a video on YouTube and answering the key questions • Test	• Student's manual • PowerPoint • Assignment papers • Computer/laptop • Connection to YouTube • Test

Teachers Evaluation of the lesson

- Process evaluation; how did it go?

……
……

- Product evaluation; do the students master the content? Did they learn what it is about?

……
……

Time schedule per lesson of 60 minutes:

1.3 CARBON FOOTPRINT

Time	What	How	Media used – teachers resource kit
LESSON 1			
20 20 20	3. Carbon footprint 3.1. Definition 3.2. The Consumer Footprint Calculator (general)	• Reading the text under 3. • Reading the text under 3.1. • Reading the text under 3.2.	• Student's manual • PowerPoint • Computer/laptop
LESSON 2			
30 10 20	3.2. The Consumer Footprint Calculator (general) 3.3. How to reduce your personal carbon footprint?	• Assignment: Measuring your own carbon footprint by taking different online tests • Reading the text under 3.3. • Assignment: Creating an awareness campaign	• Student's manual • PowerPoint • Computer/laptop • Tests online • Paper in different colors • Glue • Scissors • Pencils and markers • Computer program to create a poster or flyer digitally
LESSON 3			
40 20	3.3. How to reduce your personal carbon footprint?	• Assignment: Creating an awareness campaign + presenting it • Test	• Paper in different colors • Glue • Scissors • Pencils and markers

	Evaluation on "Carbon footprint"		• Computer program to create a poster or flyer digitally

Teachers Evaluation of the lesson

- Process evaluation; how did it go?

……
……

- Product evaluation; do the students master the content? Did they learn what it is about?

……
……

2. Energy and sustainability.

OBJECTIVES OF THE LESSON

The aim of this topic is mainly for students to learn what energy is, where it comes from, how it is produced and what its environmental impact is so that they can make conscious decisions in their hairdressing salon.

In addition to this manual, two other manuals are available:

- The teacher's resource kit, where you will find activities, PowerPoint presentations and other tools to use in the classroom.
- The student handbook, in which they have all the information to prepare in advance or to use during the classes.

General objective of the lesson To know what energy is and its environmental impact.
Knowledge • Explain what energy is and its types. • Identify energy sources. • Distinguish between renewable and non-renewable energies. • To understand the environmental impact of energy. • Explain what clean energy is. **Ability** • Describe the energy used in the hairdressing salon. • Recognise and assess the feasibility of using clean energy in the classroom. • Calculate the energy consumption of a room. • Group discussion to share ideas and reflections, evaluating results. **Attitude** • Be aware of the need to choose clean energy. • Propose ways to reduce energy consumption. • Evaluate outcomes.
Additional learning outcomes Additional competences in terms of knowledge, skills and attitudes are captured here, as some learners have a different pace of work or level of understanding. It can also be applied to differentiate between different levels of VET learning. By the end of the topic, higher ability learners should be able to: • To learn about various sources of clean energy applicable to the hairdressing salon. • Investigate clean energy suppliers that can supply the hairdressing salon. By the end of the topic, lower ability students should be able to: • To know what energies are and which ones are applied in the hairdressing salon. • Understand that energy use has a high environmental impact.

PROGRAMMING AND TIMING OF THE LESSON

In this lesson we focus on energy, its types, forms of production and uses in the classroom.

Total hours = 10-15h.

The programming has been carried out considering that each session is of one hour, however the material is adjusted to 50 min. to allow the initial reception of the students and the recapitulation of activities developed at the end.

Purpose of the lesson:

- Students should know what energy is.
- Students to distinguish the types of energy.
- Students to recognize clean energies.
- Knowledge about the environmental impact of energy use.

Planning:

Approximate scheduled time (total hours 10-15h = 10-15 sessions of 1 hour)		**What**	**How**	**Tools**
Session 1	10 min.	Introductory video	Video viewing 1. Refer to the teacher's resource kit.	Projector, digital whiteboard or computers.
	40 min.	Theory: General concept of energy and its properties, types of energy and electrical energy.	Teacher's presentation.	Power-point. See the teacher's resource kit. Whiteboard and projector or digital whiteboard.
Session 2	10 min.	Activity 1	Students work in pairs to solve activity number 1.	Pair activity by completing the activity sheet. See the teacher's resource kit.
	15 min.	Discussion on activity 1: students report	Student-centered. Teacher guides	Blackboard.

		their findings to the group and discuss their truth or accuracy.	and corrects at the end.	
	15 min.	Activity 2	Students work on a one-to-one basis.	The teacher can provide different locations or leave it up to the students to decide.
	10 min.	Sharing of activity 2	Students present their findings.	
Approximate scheduled time (total hours 10-15h = 10-15 sessions of 1 hour)		**What**	**How**	**Tools**
Session 3	40 min.	Theory: Concepts of energy sources.	Teacher's presentation.	Power-point. See the teacher's resource kit. Whiteboard and projector or digital whiteboard.
	10 min.	Videos on renewable and non-renewable energy sources.	Watch videos 2 and 3. See the teacher's resource kit.	Projector, digital whiteboard or computers.
	5 min.	Video on blue energy.	Video viewing 4. See teacher's resource kit.	Projector, digital whiteboard or computers.
Session 4	15 min.	Activity 3	Students work on a one-to-one basis.	Computer or telephone.
	15 min.	Sharing of activity 3	Students present their findings and discuss the importance of fossil fuels.	The teacher guides the discussion by proposing questions on fuel applications and possible alternatives.

	20 min.	Activity 4	Students work on a one-to-one basis.	Computer or telephone.
Approximate scheduled time (total hours 10-15h = 10-15 sessions of 1 hour)		**What**	**How**	**Tools**
Session 5	50 min.	Sharing of activity 4	Students present their findings and discuss energy use.	The teacher guides the discussion by proposing questions about the different energies and their options for use in the classroom.
Session 6	10 min.	Video on energy and the environment.	Video viewing 5. Refer to the teacher's resource kit.	Projector, digital whiteboard or computers.
	40 min.	Theory: Concepts on the environmental impact of energy and clean energy.	Teacher's presentation.	Power-point. See the teacher's resource kit. Whiteboard and projector or digital whiteboard.
Approximate scheduled time (total hours 10-15h = 10-15 sessions of 1 hour)		**What**	**How**	**Tools**
Session 7	5 min	Video on energy and the environment.	Video viewing 6. Refer to the teacher's resource kit.	Projector, digital whiteboard or computers.
	45 min.	Activity 5	Students work on a one-to-one basis.	Computer or telephone.
Session 8	35 min.	Sharing of activity 3	Students present their findings and	The teacher guides the discussion by

			discuss the importance of fossil fuels.	proposing questions on different energies and encouraging debate on nuclear energy.
	15 min.	Video on nuclear energy	Video viewing 7. Refer to the teacher's resource kit.	Projector, digital whiteboard or computers.
Approximate scheduled time (total hours 10-15h = 10-15 sessions of 1 hour)		**What**	**How**	**Tools**
Session 9	30 min.	Activity 6	Students work on a one-to-one basis.	Computer or telephone.
	20 min.	Sharing	The teacher asks the students the meaning of each of the terms and clarifies doubts or expands on the information.	
Session 10	20 min	Video on energy and the environment.	Video viewing 8. Refer to the teacher's resource kit.	Projector, digital whiteboard or computers.
	30 min.	Theory: Concepts on the effects of energy on the environment.	Teacher's presentation.	Power-point. See the teacher's resource kit. Whiteboard and projector or digital whiteboard.

Approximate scheduled time (total hours 10-15h = 10-15 sessions of 1 hour)		**What**	**How**	**Tools**
Sessions 11 and 12	100 min.	Activity 7	Students work on a one-to-one basis.	Computer or telephone.
Session 13	30 min.	Activity 8	Students work in groups.	Computer or telephone.
	20 min.	Sharing	The actions are outlined and a complete checklist is generated.	Computer and digital whiteboard.
Session 14	50 min.	Theoretical test	Students respond to the questions posed.	Paper or Google Form.

3. Water

Water:

Lesson 1

3.1 'Water - a resource threatening to become scarce'

- Facts and figures
- Water - resource threatening to become scarce
- How can we save water with simple steps

Lesson 2 'Water pollution and water purification'

- Water pollution in general. Ocean clean-up project
- Waste water purification: who does it and how it happens

Introduction Lesson 1

In this lesson we focus on: **'Water - a resource threatening to become scarce'**.

- Total contact hours = 1

Beginning situation: this class is meant for students with no or minimum basic understanding and skills about water management and water saving in and around a beauty salon.

General goal: for students to gather knowledge on water management and to be conscious about the threat of this resource and how we can save water in simple steps. Also to get familiar with water pollution, the ocean clean-up project and waste water purification.

Objectives of the lesson:

- for students to be able to look at the resource water and to get familiar with the problems around the threat that water becomes scarce
- For students to know facts and figures about the threat of water becoming scarce
- For students to have knowledge on how we can save water with simple steps, water pollution (Ocean clean-up project) and purification

Lesson Plan

Time scheduled **(total 1 hour = 60 minutes)**	**What**	**How**	**Media used**
5 minutes	Regular student registration Theme introduction: Water: a resource	Teacher does the registration and introduces the subject + objectives	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)

	threatening to become scarce.		
10 minutes	Group activity to talk about the threat. The main question is: 'what do you think is the cause of the threat?'	Students to talk about the subject with the main question as a focus Teacher: sharing ideas of what can cause the threat with facts and figures	Group discussion • PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)
10 minutes	Explanation about saving water with simple steps and why should we?	Student focused Teacher present the information	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)
10 minutes	Water pollution causes, Ocean clean-up project, preventing	Student watching YouTube clip and listening to presentation from the teacher	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)
20 minutes	Activity	Students working in pairs to answer the following question: 'what do you see as one of the major risk for water pollution in your region? And in hairdressing? Which of the 4 causes presented earlier belongs this risk to? Students are writing down their findings in their device and presents them in the last 10 minutes	Activity in pairs. Please refer to teachers resource kit. • PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher) • Device (students)
5 minutes	Self-study explained Recap led to next week and answering the questions	As self-study assignment the students are going to read about water purification and study the principles of water purification by the award-winning company Hydraloop	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher) • Information about water purification to

			give to the students (digital)

Resources:

Video water pollution: https://youtu.be/Om42Lppkd9w

https://theoceancleanup.com/

https://www.hydraloop.com/

https://www.nrdc.org/stories/water-pollution-everything-you-need-know#whatis

Worldwide water shortage by 2040 -- ScienceDaily

Shortages: Water supplies in crisis - BBC News

https://thelastwell.org/2019/04/eye-opening-facts-about-the-water-crisis-inafrica/

Introduction Lesson 2

In this lesson we focus on:

3.2 'Water pollution and water purification'.

- Total contact hours = 1

Beginning situation: this class is meant for students with basic understanding and skills about water management and water saving in and around a beauty salon. This class elaborates on the first lesson.

General goal: for students to gather knowledge on purification of waste water.

Objectives of the lesson:

- For students to understand the concept purification
- For students to experiment with filtering water

Lesson Plan

Time scheduled **(total 1 hour = 60 minutes)**	**What**	**How**	**Media used**
10 minutes	Regular student registration Theme introduction: water purification and filtering	Teacher does the registration and introduces the subject + objectives with facts and figures and asks about the self-study assignment	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)

5 minutes	Explanation experiment	Students focused Teacher present the information	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)
30 minutes	Experiment water filtering	Teacher gives students waste water (sand, gravel, color) + filters. Students experiment with filtering the waste water 3 times in different sample tubes and write down their findings of the experiment	• Sand, coffee filter, gravel, waste water after coloring hair, sample tubes, funnel
10 minutes	Aftertalk experiment	Students present their findings Teacher is asking questions and answering them	
5 minutes	Recap led to next week and answering the questions	Students ask questions to gain more knowledge	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)

Resources:

https://www.hydraloop.com/

https://www.plasticsoupfoundation.org/

4. Waste

Introduction Lesson 3

In this lesson we focus on

4.1 Recycling Waste

- Total contact hours = 1

Beginning situation: this class is meant for students with no or minimum basic understanding and skills about waste, recycling and microplastics.

General goal: for students to gather knowledge on waste and recycling and to be conscious about the threat of microplastics. Also to get familiar with circular economy.

Objectives of the lesson:

- For students to understand the concept of recycling and the threat of waste
- For students to have knowledge on the benefits of reusing and recycling
- For students to have knowledge of waste management

Lesson Plan

Time scheduled **(total 1 hour = 60 minutes)**	**What**	**How**	**Media used**
5 minutes	Regular student registration Theme introduction: Reducing waste	Teacher does the registration and introduces the subject + objectives	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)
10 minutes	Group activity for students to think about types of waste that we can reduce the usage by searching fact and figures on the internet	Students to work in small groups (3/4). Students write down their findings on their device Teacher is leading the aftertalk	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher) • Device (student)
10 minutes	Explanation why waste is a growing problem. Reduce,	Student focused Teacher present the information	• PowerPoint. (please refer to the teachers resource kit)

	reuse and recyling and how to do it wisely		• White board or digiboard • Laptop (teacher)
7 minutes video 3 minutes aftertalk	Kenya dump dwellers recyling hair extensions YouTube video Making the connection with circular economy	Student watching clip, writing down notes Teacher making the connection with circular economy	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher) • Device (student)
20 minutes	Activity beat the microplastics	Students work in pairs to check through the microplastic app how much microplastic is in the products they have on them right now. Students write down their findings on their device	Activity in pairs working with the microplastic app • PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher) • Device (student)
5 minutes	Recap led to next week and answering the questions	Students ask questions to gain more knowledge	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)

Resources:

YouTube video: https://youtu.be/tCbFl9UHQh4

https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html]

https://ec.europa.eu/eurostat/web/waste

https://thinkbigactnow.org/en/what-is-hidden-impact/

https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview

https://www.beatthemicrobead.org/download-btmb-app/ or scan the Qr-code

Introduction Lesson 4

In this lesson we focus on

4.2 Circular economy and waste as new raw material

- Total contact hours = 1

Beginning situation: this class is meant for students with basic understanding and skills about waste, recycling and microplastics.

General goal: for students to gather knowledge on circular economy and to get familiar with using waste as new material.

Objectives of the lesson:

- Getting acquainted with concept of circular economy
- Getting acquainted with waste as a new raw material
- Experiment with recycling paper

Lesson Plan

Time scheduled **(total 1 hour = 60 minutes)**	**What**	**How**	**Media used**
5 minutes	Regular student registration Theme introduction: circular economy and waste as a new raw material	Teacher does the registration and introduces the subject + objectives	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)
10 minutes	Explanation about circular economy and waste as a new raw material	Students are focused Teacher present the information	• PowerPoint. (please refer to the teachers resource kit)

			• White board or digiboard • Laptop (teacher)
40 minutes	Experiment recycling paper Short video for inspiration	Students focused on the short video. Students make the used paper and carton in tiny pieces in groups of 4. All the tiny pieces are going in the blender together with water to make pulp. With the ice-cream sticks they make a frame and glue the thin fabric on top of it. Put the pulp in water. Put the frame in the water to spread the pulp on top of it and let most of the water drip out. Let it dry for a few hours in the sun or next to a heater. See the result. New paper.	• Blender, carton or used paper, water, icecream sticks, glue, rolling pin, old thin fabric, water bucket • PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)
5 minutes	Recap what we did this lesson and answering the questions	Students ask questions to gain more knowledge	• PowerPoint. (please refer to the teachers resource kit) • White board or digiboard • Laptop (teacher)

Resources:

Short video paper recycling: https://youtube.com/shorts/8LsVgiIupII?feature=share

https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview

5. RAW MATERIALS

1. Goals-Subgoals-Objectives

The first objective of the module is to make known the meaning of “raw material", not necessarily linked to the professional sector of well-being, knowing how to distinguish between the different types classified according to the different sources of extraction or production and thinking about any problems related to the environmental impact that each produce.

The second step and objective is to introduce the presence of raw materials in the objects present and used in a beauty salon to make the operators, who have already acquired the concepts related to the primary objective described above, aware of what they decide to buy or use for their professional activity.

In addition to this manual, two other manuals are available:

- The teacher's resource kit, where you will find activities, links and other tools to use in the classroom.
- The student handbook, in which they have all the information to prepare in advance or to use during the classes.

2. Starting situation and timetable

It is supposed to start from a situation where you are not aware of any concept related to the theme of raw materials. Thus, the work could be structured as follows:

Lesson 1 (50 min)

- Definitions and classification (objective 1)
- Activities

Lesson 2 (50 min)

- Water as raw material (objective 1)
- Activities

Lesson 3 (50 min)

- Raw materials in products and equipment: where is what (objective 2)
- Activities

It may be necessary, depending on the learning speed of the learners, to divide Lesson 2 in two to give the right space to activities that allow awareness and to acquire, with practice and personal research, the contents.

3. LESSON 1 – Lesson plan

Approximate scheduled time (tot = 50 min)	**What**	**How**	**Tools**
10 min	Introduction and presentation of the main goals of the lesson	Write down a mind map on the board by teacher	Digital board Laptop (teacher) Video (refer to the Resource Kit) Students Workbook (paper or digital)
5 min	introductory video: "Raw materials. Why do they matter?"	Video viewing	Video (refer to the Resource Kit)
15 min	Thinking activation	Students brain storming starting from teacher' suggested questions	Questions you find on Textbook or additional question (refer to the resource Kit) Digital board (if needed)
15 min	General concept about different types of raw material	Teacher's presentation	Digital board Laptop (teacher) Presentation built using the proposed material (refer to the Resource Kit) Students Workbook (paper or digital)
5 min	Closure of the lesson	Student Activity 1	Digital board Students Workbook (paper or digital)

4. LESSON 2 – Lesson plan

Approximate scheduled time (tot = 50 min)	**What**	**How**	**Tools**
10 min	Introduction and presentation of the main goals of the lesson	Write down a mind map on the board by teacher	Digital board Laptop (teacher) Video (refer to the Resource Kit) Students Workbook (paper or digital)
5 min	Calculate students personal water footprint	Use the online calculator suggested in Resource Kit	Digital Board Students personal electronic device to access the online calculator

15 min	Thinking activation	Students brain storming starting from teacher' suggested questions	Questions you finf on Textbook ora additional question (refer to the resource Kit) Digital board (if needed)
15 min	General concept about water as a raw material	Teacher's presentation	Digital board Laptop (teacher) Presentation built using the proposed material (refer to the Resource Kit) Students Workbook (paper or digital)
5 min	Closure of the lesson	Student Activity 1	Digital board Students Workbook (paper or digital)

5. LESSON 3 – Lesson plan

Approximate scheduled time (tot = 50 min)	**What**	**How**	**Tools**
5 min	Introduction and presentation of the main goals of the lesson	Write down a mind map on the board by teacher	Digital board Laptop (teacher) Video (refer to the Resource Kit) Students Workbook (paper or digital)
15 min	General concept about water as a raw material	Teacher's presentation	Digital board Laptop (teacher) Presentation built using the proposed material (refer to the Resource Kit) Students Workbook (paper or digital)
25 min	Research about specific raw material in furniture, equipment or cosmetics products	Refer to proposed Activity 2 on this book	Students Workbook (paper or digital) Digital devices or PC to access Internet
5 min	Closure of the lesson	Student Activity 1	Digital board Students Workbook (paper or digital)

For the proposed **Activity 1** students are suggested to use an App like "Mural" to create two different mind maps. Here's some useful tutorials:

About how to build a mind-map
https://www.youtube.com/watch?v=xCyjFipytRE

About using Mural
https://support.mural.co/en/articles/6672185-how-to-use-mural-your-quickstart-guide

Mural alternatives
MIRO - https://miro.com/mind-map/

CANVA - https://www.canva.com/graphs/mind-maps/

More activities you must propose to students may be:

Activity 2 - Research and analysis of a particular raw material: Assign students a raw material, such as copper or plastic, and have them research its uses, sources, and challenges related to ensuring its sustainable use. Students could present their findings in a written report or a multimedia presentation.

Activity 3 - Sustainable product design: Ask students to design a product that uses raw materials in a sustainable way. This could involve upcycling or repurposing materials, using sustainable alternatives, or making products that are designed for recyclability or reuse. Students could create prototypes of their products and present them to the class along with an analysis of their sustainability features.

6. MANAGEMENT

1. Goals-Subgoals-Objectives

The main objective of the module is to provide the basic notions related to business and management concepts and to present the function and tasks of a business manager.

The second step is to know how to distinguish between the figure and the functions of the owner and the business manager being aware that, sometimes, do not coincide within a company.

In addition to this manual, two other manuals are available:

- The teacher's resource kit, where you will find activities, links and other tools to use in the classroom.
- The student handbook, in which they have all the information to prepare in advance or to use during the classes.

2. Starting situation and timetable

It is supposed to start from a situation where you are not aware of any concept related to the theme of business and management. Thus, the work could be structured as follows:

Lesson 1 (50 min)

- General know-how about business and management (objective 1)
- Activity 1

Lesson 2 (50 min)

- Management activities in a hair and beauty salon (objective 2)
- Activity 2

3. LESSON 1 – Lesson plan

Approximate scheduled time (tot = 50 min)	**What**	**How**	**Tools**
5 min	Introduction and presentation of the main goals of the lesson	Write down a mind map on the board by teacher	Digital board Laptop (teacher) Video (refer to the Resource Kit) Students Workbook (paper or digital)

5 min	Introductory video: "Business Administration in 2 Minutes"	Video viewing	Video (refer to the Resource Kit)
20 min	General concept about what business and management are	Teacher's presentation	Digital board Laptop (teacher) Presentation created by teacher Students Workbook (paper or digital)
10 min	Thinking activation	Students brain storming starting from teacher' suggested questions	Questions you find on Textbook Digital board (if needed)
10 min	General concept about figures of owner and manager	Teacher's presentation	Digital board Laptop (teacher) Presentation created by teacher Students Workbook (paper or digital)
5 min	Closure of the lesson	Student Activity 1	Digital board Students Workbook (paper or digital)

4. LESSON 2 – Lesson plan

Approximate scheduled time (tot = 50 min)	**What**	**How**	**Tools**
5 min	Introduction and presentation of the main goals of the lesson	Write down a mind map on the board by teacher	Digital board Laptop (teacher) Video (refer to the Resource Kit) Students Workbook (paper or digital)
10 min	Group Work: think about the activities of a manager in a beauty salon	Activity 2 (first part)	Students Workbook (paper or digital) Electronic device connected to the Internet
5 min	Brainstorming about Activity2 outcomes	Guided student's presentation	Students Workbook (paper or digital) Outcomes of Activity2

15 min	General concept about what are the activities of a manager in a beauty salon	Teacher's presentation	Digital board Laptop (teacher) Presentation created by teacher Students Workbook (paper or digital)
10 min	Group Work: review of the previously created map	Activity 2 (second part)	Students Workbook (paper or digital) Electronic device connected to the Internet
5 min	Closure of the lesson	Student Activity 1	Digital board Students Workbook (paper or digital)

Sustainable Salon

Learning material Sustainable salon

Teachers toolkit Module 1

Funded by the European Union

Authors: CIOFS-FP Lombardia, IES El Palo, Richtpunt campus Oudenaarde, ROC Amsterdam

Future skills for a better life in Sustainable Salons is a European project that aims to combine the sustainable ideas through education and training with innovative ideas within the sector.

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

The project partners and associated partners within this program are:

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Project website: www.sustainable-salon.info

Index

1. Sustainability, Climate Change and Carbon Footprint 4

1. 1 Assignments + solutions + evaluation forms – Scans on sustainability 24

1.2 Assignments + solutions + evaluation forms – Unhealthy planet 33

1.3 Assignments + solutions + evaluation forms – Climate conferences and sustainable development goals 61

2. Energy and sustainability 71

2.1 Theoretical test: 81

3. Water: 83

3.1 Water - friend and enemy: The Netherlands as waterland & the Dutch water management (extra-curricular materials) 83

4. Waste: 86

5. RAW MATERIALS 87

6. MANAGEMENT 89

1. Sustainability, Climate Change and Carbon Footprint

Lesson 1

Media used for this lesson is:

- White board
- Post-its
- Student's manual
- PowerPoint
- Computer/laptop
- Cell phone or telephone

PowerPoint presentation

A PowerPoint presentation was made for module 1 on sustainability, climate change and carbon footprint.

It has the same structure as the student's manual, but it's more of a resume with key words. In the presentation you can also find extra information. Also the assignments are included.

See the document PowerPoint module 1 - Sustainability_climate change_carbon footprint

Assignments

The assignments are made separately on assignment papers that can be printed. There are assignments everyone should make and additional assignments as well for students who could extend their knowledges and skills.

Evaluation forms

Every assignment has an evaluation form.

Assignments + solutions + evaluation forms - The concept: What does "sustainability" mean?

student's manual: page 7

What do you think "sustainability" means being a hairdresser? Write down words or short sentences. Inspire yourself by using the words or sentences from the post-its.

Would you be able to give a definition to the word "sustainability"?

Sustainability means

student's manual: page 7

What do you think "sustainability" means being a hairdresser? Write down words or short sentences. Inspire yourself by using the words or sentences from the post-its.

Would you be able to give a definition to the word "sustainability"?

Sustainability means fulfilling the needs of current generations without compromising the needs of future generations, while ensuring a balance between economic growth, environmental care and social well-being

Assignment student's manual p. 7

Give a score to yourself.

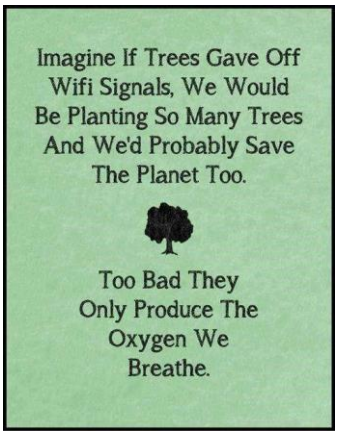
Evaluation criteria – self evaluation	**Outstanding**	**Very good**	**Average**	**Below average**
I was involved in the brainstorm on "sustainability".				
I wrote words or sentences on the post-its.				
I've put my post-its on the white board.				
I've written words or sentences in the wordweb on the assignment paper.				
I was able to define the word "sustainability".				
I wrote the definition on the assignment paper.				

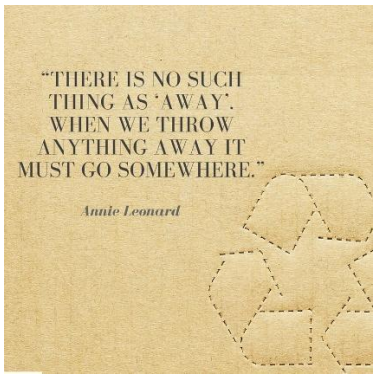
What did you do good? What skills or knowledge are you proud of?

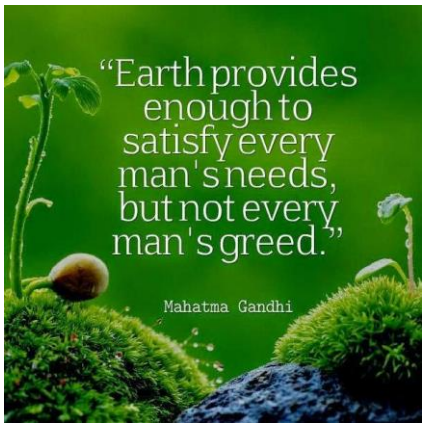
What could you've done better and how?

Additional assignments

Have a look at the following quotes. What do they say about "sustainability"?





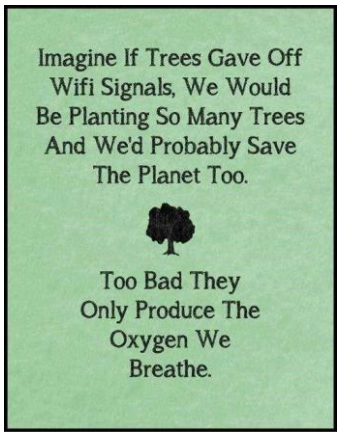


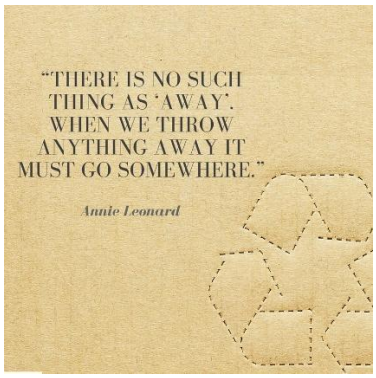
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

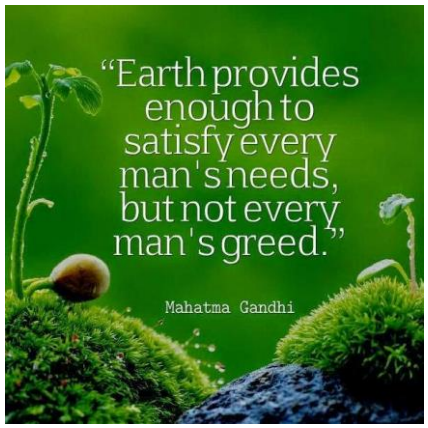
Discuss your opinions in groups.

Additional assignments

Have a look at the following quotes. What do they say about "sustainability"?







Nowadays people are focused on being accessible all the time and to have access at all times via Wi-Fi. For that reason they should plant many trees. Only if they could see that trees are

We have to realize that when we throw things away, that it's only out of sight, but not really away. We need a lot of different systems to recycle or reuse waste.

As people we always want more and more and more. The earth can provide in everything we need to be able to survive, but not in that extend when we get greedy as human beings.

so very important, because they produce the oxygen we breathe, which is so much more important than the viral reliability.

Discuss your opinions in groups.

Additional assignment

Give a score to yourself.

Evaluation criteria – self evaluation	**Outstanding**	**Very good**	**Average**	**Below average**
I understand the quotes.				
I can define what they say about sustainability.				
I can give my own opinion.				
I can listen to someone else's opinion.				
I can discuss my opinion.				
I can adjust my opinion if necessary.				

What did you do good? What skills or knowledge are you proud of?

What could you've done better and how?

Additional assignments

To have a clear idea about how to pay attention to sustainability as a hairdresser, you need to be able to properly assess the different work items.
Have a look at the pictures and name the different work stations in a salon.


shutterstock.com · 225385750

……. …….


shutterstock.com · 551508205

……. …….

……. …….

Discuss in groups.

- Do you have an idea about which work station produces the most waste?
- Which natural element would be polluted the most?
- What is the biggest waste produced in the hair salon, according to you?
- Do you think customers are engaged in sustainability in the hair salon?
- Could you leave out certain services in the salon to act more sustainably?
- Could you make certain sustainable choices to have a more favorable effect on pollution?
- Do you think being sustainable costs a lot of money?
- As a future hairdresser or barber yourself, have you thought about sustainable concepts?
- Do you have enough knowledge to make sustainable choices?

Additional assignments

To have a clear idea about how to pay attention to sustainability as a hairdresser, you need to be able to properly assess the different work items.
Have a look at the pictures and name the different work stations in a salon.

washing

cutting

colouring

perming

styling

management

Discuss in groups.

- Do you have an idea about which work station produces the most waste?
  colouring
- Which natural element would be polluted the most?
  water
- What is the biggest waste produced in the hair salon, according to you?
  personal answer
- Do you think customers are engaged in sustainability in the hair salon?
  personal answer
- Could you leave out certain services in the salon to act more sustainably?
  Off course you can, but does it fit in the needs of the costumers then and aren't we replacing a problem to somewhere else?
- Could you make certain sustainable choices to have a more favorable effect on pollution?
  Sure, you could use ecofriendly products and materials and furniture, you could use LED lights, you could use solar heaters, …
- Do you think being sustainable costs a lot of money?
  personal answer.
- As a future hairdresser or barber yourself, have you thought about sustainable concepts?
  personal answer
- Do you have enough knowledge to make sustainable choices?
  personal answer

Additional assignment

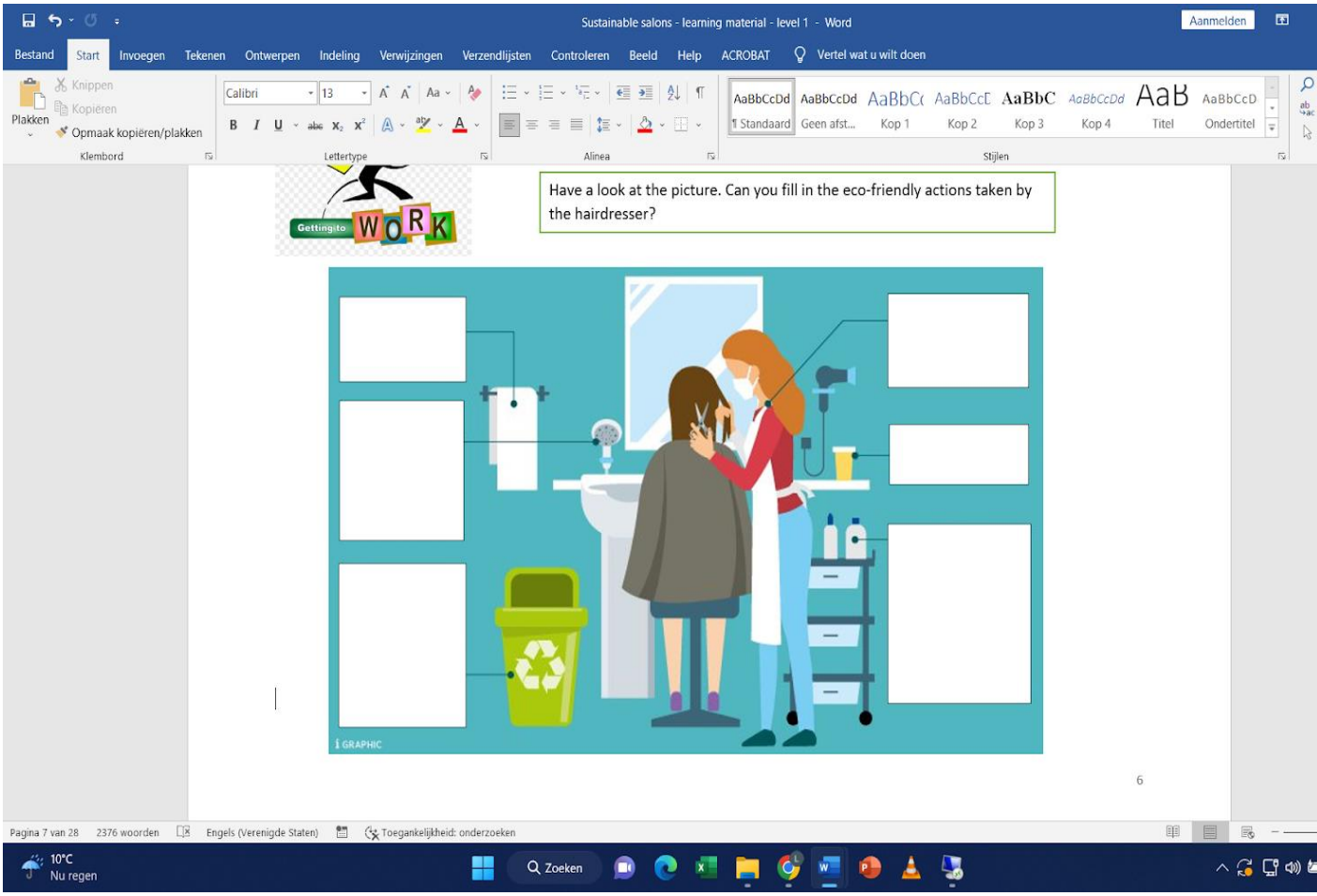
Evaluation form

Evaluation criteria	**Outstanding**	**Very good**	**Average**	**Below average**
I was able to name the different workstations.				
I know which workstation produces the most waste.				
I know which natural element would be polluted the most.				
I know the biggest waste produced in the hair salon.				
I can explain my opinion on how I think about customers being engaged in sustainability in the hair salon.				
I can give an example of certain services that can be left out in the salon to act more sustainably.				
I can make certain sustainable choices to have a more favorable effect on pollution.				
I can explain my opinion on the costs of being sustainable as a hairdresser.				
As a future hairdresser or barber myself, I have thought about sustainable concepts.				
I have enough knowledge to make sustainable choices.				

Was this assignment difficult for you or not? Explain.

Additional assignments

Have a look at the picture. Can you fill in the eco-friendly actions taken by the hairdresser?



Additional assignments

Have a look at the picture. Can you fill in the eco-friendly actions taken by the hairdresser?

Additional assignments

Think about the salon where you work as a trainee or a qualified hairdresser.
Can you think of any sustainable modifications that has already been taken? If not, can you think of some yourself?

	Sustainable modifications
 Shampooing	
 Cutting	
 Colouring	

 Perming	
 Styling	
 Management	

Additional assignments

Think about the salon where you work as a trainee or a qualified hairdresser.
Can you think of any sustainable modifications that has already been taken? If not, can you think of some yourself?

	Sustainable modifications
 Shampooing	personal answers depending on the salon they work in
 Cutting	personal answers depending on the salon they work in
 Colouring	personal answers depending on the salon they work in
 Perming	personal answers depending on the salon they work in
 Styling	personal answers depending on the salon they work in
 Management	personal answers depending on the salon they work in

Additional assignment

Evaluation form

Evaluation criteria	**Outstanding**	**Very good**	**Average**	**Below average**
I was able to fill in the eco-friendly actions taken by the hairdresser.				
I was able to give sustainable modifications based on the salon where I work.				

Was this assignment difficult for you or not? Explain.

What did you learn from this assignment? Name skills as well as knowledge or attitudes.

Additional assignments

Have a look at the following site: https://www.greensaloncollective.com/
Try to fill in the grid.

Salon waste	Ways of recycling	Positive influences on …
Hair		
Metals		

Chemicals		
Towels		
PPE		
Plastic		
Paper		
Food		

Additional assignments

Have a look at the following site: https://www.greensaloncollective.com/
Try to fill in the grid.

Salon waste	Ways of recycling	Positive influences on …
Hair	composting and gardening waterway cleanups hair mats	soil water water
Metals	collecting it	soil contamination
Chemicals	using them to generate energy	soil water
Towels	composting	soil water
PPE	burning it to generate energy	litter water soil
Plastic	transforming into new products	soil water
Paper	recycling	soil water
Food	converting into nutrient-rich fertilizer	soil

Additional assignment

Evaluation form

Evaluation criteria	Outstanding	Very good	Average	Below average
I was able to found the different ways of recycling for the salon waste.				
I was able to define the positive influences.				

Was it easy to find the information on the website? Explain.

Were there things you've never heard of before?

Assignments + solutions + evaluation forms – When are you sustainable?

student's manual: page 10

Make a list of actions you can use to become more sustainable at home. You can use the text in the student's manual or the Internet of your own knowledge.
Try to find at least 10 different actions.

10 actions to become sustainable @ home

student's manual: page 10

Make a list of actions you can use to become more sustainable at home. You can use the text in the student's manual or the Internet of your own knowledge.
Try to find at least 10 different actions.

10 actions to become sustainable @ home
bike more and drive less
use a dual flush toilet
cut down what I throw away and think about reusing it
take a short shower instead of a bath
use a reusable bag when shopping
shop local
buy less plastic
use nontoxic chemicals to clean
use an energy saving system at home
set the temperature between 19°C and 21°C

Assignment student's manual p. 10

Give a score to yourself.

Evaluation criteria – self evaluation	**Outstanding**	**Very good**	**Average**	**Below average**
I was able to give 10 actions to become more sustainable at home.				

Where did you find the information?

Which actions are you really going to take at your own home? Maybe someone else's actions inspired you.

student's manual: page 10

For this assignment you need to work in pairs.
Find a salon in your neighborhood that you think is working sustainably.
Make a presentation of the salon using the guidelines below.

- Prepare 10 questions you are going to ask the hairdresser(s) in the salon. Make sure you focus on sustainability.
- Make a physical appointment or schedule an online conversation with camera.
- Note the answers you get during the interview.
- Ask for illustrative material to include in your presentation.
- Prepare a presentation about the sustainability of the salon.
- Present your presentation to the class group.

10 questions + answers for the hairdresser
Q:
A:
Q:
A:
Q:
A:
Q:
A:
Q:
A:
Q:
A:
Q:
A:
Q:
A:
Q:
A:
Q:
A:

Appointment made with the hairdresser	
when?:	where?:

Guidelines presentation
Presentation should be made in PowerPoint or Prezi.
Give an overview of the most information you got from the interview by using key words.
Illustrations should be functional.

Conclusion after the presentation
Which hairdresser is the most sustainable according to you and why?
What standards must a salon comply with to be considered as being sustainable?

Assignment student's manual p. 10

The teacher will score you.

Evaluation criteria	**Outstanding**	**Very good**	**Average**	**Below average**
The 10 questions were well formulated.				
The 10 question focused on "sustainability".				
The answers given by the hairdresser were well formulated into understandable sentences.				
The appointment with the hairdresser was prepared as asked: time and place were determined.				
The presentation is made in a tool such as PowerPoint or Prezi.				
The presentation is attractive.				
The presentation gives an overview on the sustainability of the salon.				
Key words are used in the presentation.				
Illustrations are functional.				
During the presentation you used a clear voice.				
During the presentation you were understandable and easy to follow.				
During the presentation you used a good pace.				

During the presentation there was interaction with the public.				
During the presentation you were not nervous.				
During the presentation you were convincing.				
You can formulate a conclusion.				
You can give 5 standards a salon must comply to to be considered as being sustainable.				

1. 1 Assignments + solutions + evaluation forms – Scans on sustainability

student's manual: page 12

We will divide in 3 groups to take the scans and process the results.
The scans can be found on https://www.sustainable-salon.info/kopie-van-output-2-sustainability-syste

- **First group: You will take the awareness scan from 5 different teachers at 3 different hairdressing schools. You keep a good record of the results of the scans to create a clear overview in charts later.**
- **Second group: You will take the awareness scan in 15 different salons, preferably across the country. You keep a good record of the results of the scans to create a clear overview in charts later.**
- **First group + second group: You will take the extended scan in 5 different salons, depending on the need and the results of the awareness scan.**
- **Third group: You will take the scan on organization context of a sustainable salon from 5 recently opened businesses (up to 1 year) and 5 salons that are already open for more than 1 year, but less than 5 years and 5 salons that are open for more than 5 years.**

FIRST GROUP		
Hairdressing schools	5 different teachers	Where or how did you save the results?
Contact details school 1:		
Contact details school 2:		
Contact details school 3:		

SECOND GROUP	
15 different salons	Where or how did you save the results?
Contact details salon 1:	
Contact details salon 2:	
Contact details salon 3:	
Contact details salon 4:	
Contact details salon 5:	
Contact details salon 6:	

Contact details salon 7:	
Contact details salon 8:	
Contact details salon 9:	
Contact details salon 10:	
Contact details salon 11:	
Contact details salon 12:	
Contact details salon 13:	
Contact details salon 14:	
Contact details salon 15:	

FIRST + SECOND GROUP	
5 different salons	What were the needs? Where or how did you save the results?
Contact details salon 1:	
Contact details salon 2:	
Contact details salon 3:	
Contact details salon 4:	
Contact details salon 5:	

THIRD GROUP	
5 salons recently opened (up to 1 year)	Where or how did you save the results?
Contact details salon 1:	
Contact details salon 2:	
Contact details salon 3:	
Contact details salon 4:	
Contact details salon 5:	
5 salons open for > 1 < 5 years	Where or how did you save the results?
Contact details salon 1:	
Contact details salon 2:	
Contact details salon 3:	
Contact details salon 4:	
Contact details salon 5:	
5 salons open for > 5 years	Where or how did you save the results?
Contact details salon 1:	
Contact details salon 2:	
Contact details salon 3:	
Contact details salon 4:	
Contact details salon 5:	

Make graphic visuals of the results from the scans.

Show them to all the students and explain them.

I hope the graphic visuals have given you a clear view on the results of the different scans. Write the conclusions that were made underneath.

Conclusion awareness scan schools:

Conclusion awareness scan salons:

Conclusion extended scan salons:

Conclusion scan on organization context of a sustainable salon:

Discuss about the results and the conclusions of the scans.

- What were you positively surprised about?
- What were you negatively surprised about?
- Did the results provide new information you didn't think about or didn't hold into consideration?
- Do you agree on the different conclusions made?
- What will be the future goals on sustainability? Chose 4 of them.
- Any ideas how to achieve those goals?

Assignment student's manual p. 10

The teacher will score you.

Evaluation criteria	**Outstanding**	**Very good**	**Average**	**Below average**
You took the correct scan to the correct amount of schools / teachers / salons.				
You saved the results from the scans.				
You made a clear graphical visual of the results.				
You were able to explain the graphical visuals of the results.				
You were able to come to conclusions.				
You participated in the class discussion on the results and conclusions.				
You could define 4 future goals on sustainability.				
You could explain how to achieve these 5 goals.				
You can work in group.				
You keep to the agreements.				
You can participate in a discussion as a listener.				
You can participate in a discussion as an active speaker.				

student's manual: page 13

We will divide into two groups.

- **Group 1: Make up a short term plan to achieve the goals set in the discussion.**
- **Group 2: Make up a long term plan to achieve the goals set in the discussion.**

Use the template, including the PDCA-principles.

Goals	Short term plan	Plan	Do	Check	Act
Goals	**Long term plan**	**Plan**	**Do**	**Check**	**Act**

Assignment student's manual p. 10

Evaluate yourself.

Evaluation criteria - self evaluation	**Outstanding**	**Very good**	**Average**	**Below average**
I can set up a short/long term plan to achieve the 4 goals.				
I can implement the PDCA-principles.				

What did you do good? What skills or knowledge are you proud of?

What could you've done better and how?

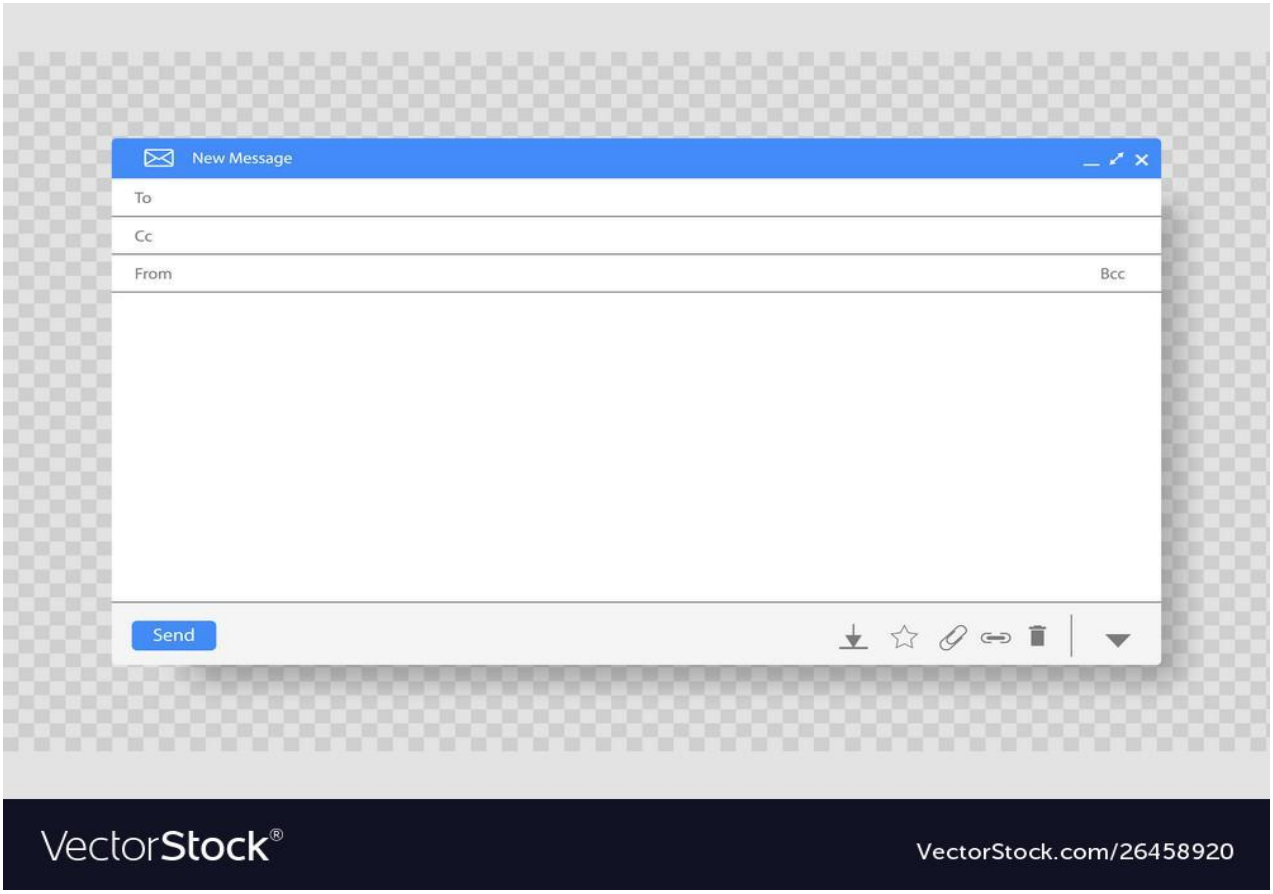
Additional assignment

Try to put your goals and short and long term plans into an advice.

The intention is to share your advice with the schools and hair salons that participated in the scans. You can do this by e-mail. Try to fill in the blank form first.

Goal	**Short or long term**	**Advice**
	□ short term □ long term	
	□ short term □ long term	
	□ short term □ long term	
	□ short term □ long term	

	□ short term □ long term	
	□ short term □ long term	
	□ short term □ long term	
	□ short term □ long term	



Additional assignment

Evaluate yourself.

Evaluation criteria - self evaluation	**Outstanding**	**Very good**	**Average**	**Below average**
I can formulate a practical advice to share to a school or salon.				
I can write an e-mail within I share my advice.				
To write an e-mail: I can fill in the receiver and the subject.				
To write an e-mail: I can begin the e-mail with a formal addressing.				
To write an e-mail: I can formulate good and understandable sentences.				
To write an e-mail: I can close the e-mail with a formal closure.				

Did you get some of reaction back after sending an e-mail with advice?

Was this assignment useful or not? Explain yourself

Assignments + solutions + evaluation forms – Definition: what is climate change? How does it happen?

student's manual: page 14

Look at the picture. Give a concrete example for the given changes. Fill in the grid.

CHANGES	EXAMPLE PER CHANGE	EXAMPLE PER CHANGE	EXAMPLE PER CHANGE	EXAMPLE PER CHANGE
Changes in the ocean				
Changes in/on the land surface				
Changes in the cryosphere				
Changes in the atmosphere				
Changes in the hydrological cycle				

student's manual: page 14

Look at the picture. Give a concrete example for the given changes. Fill in the grid.

CHANGES	EXAMPLE PER CHANGE	EXAMPLE PER CHANGE	EXAMPLE PER CHANGE	EXAMPLE PER CHANGE
Changes in the ocean	circulation	sea level	biogeochemistry	/
Changes in/on the land surface	orography	land use	vegetation	ecosystems
Changes in the cryosphere	snow	frozen ground	sea ice	glaciers
Changes in the atmosphere	composition	circulation	/	/
Changes in the hydrological cycle	atmosphere-biosphere	clouds	/	/

student's manual: page 14

Evaluate yourself.

Evaluation criteria - self evaluation	**Outstanding**	**Very good**	**Average**	**Below average**
I can give the 15 changes for the different areas.				
I understand how climate change happens.				

Was this assignment difficult for you? Explain why or why not?

Was the picture clear enough for you? Explain why or why not?

1.2 Assignments + solutions + evaluation forms – Unhealthy planet

student's manual: page 20

Read the article by clicking on the link https://www.theactuary.com/features/2021/10/07/unhealthy-planet-unhealthy-people or ask your teacher to get the text on paper.
Answer the questions below.

Give 3 possible impacts of climate change on health.

Give 4 social and economical impacts of climate change.

Note down the missing links in the framework.

What are the short-term health effects of air pollution?

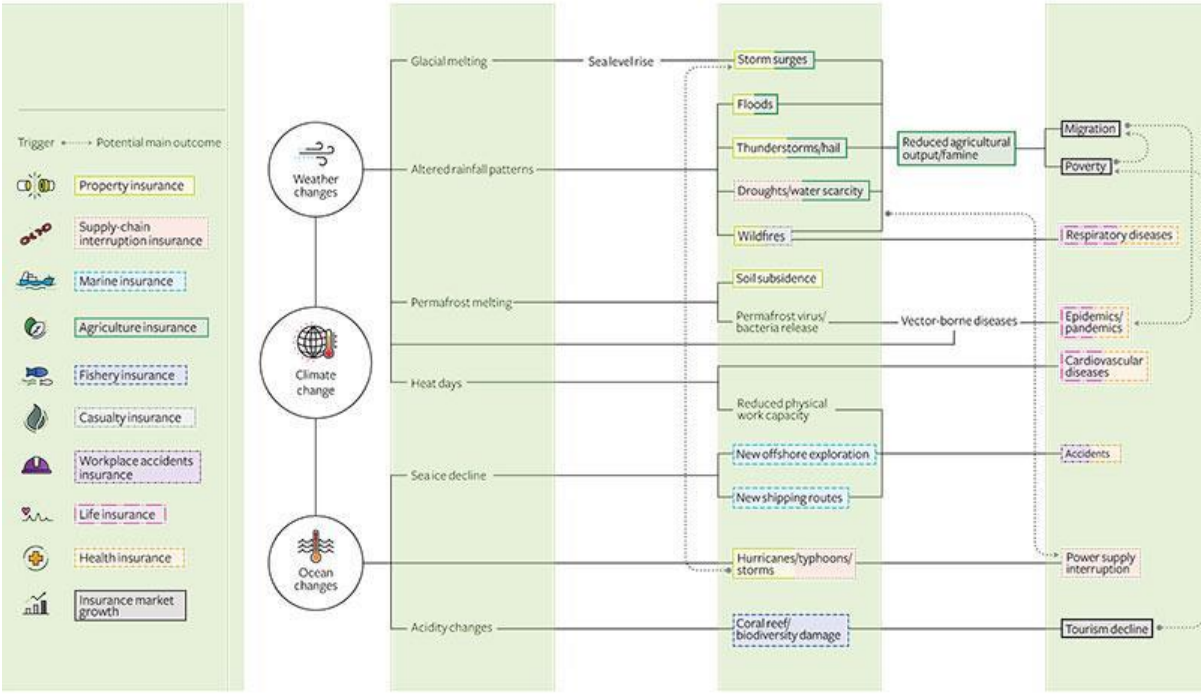
What are the long-term health effects of air pollution?

Which impact does the use of fossil fuels have on the climate?

To which diseases will lead extreme temperatures?

Which negative effect can the use of pesticides have on the nature?

Look at the picture on the next page. Talk about what you can see in the picture and try to give continental examples of your own country. For example: weather changes can lead to floods -> summer of 2021: extreme flooding in the Ardennes in Belgium -> people homeless -> migration



student's manual: page 20

Read the article by clicking on the link https://www.theactuary.com/features/2021/10/07/unhealthy-planet-unhealthy-people or ask your teacher to get the text on paper.
Answer the questions below.

Give 3 possible impacts of climate change on health.

- respiratory issues
- cardiovascular issues
- increased risk of epidemics

Give 4 social and economical impacts of climate change.

- increased migration
- poverty
- power supply disruption
- tourism decline

Note down the missing links in the framework.

What are the short-term health effects of air pollution?

- coughing
- shortness of breath
- asthma

What are the long-term health effects of air pollution?

- particulates could remain in our system for a long time and increase our risk of stroke and cardiovascular disease
- higher rates of lung cancer in non-smokers

Which impact does the use of fossil fuels have on the climate?

We would expect to see big increases in the number of hot days each year, and reductions in the number of cold days. That means an increase in heat-related deaths – mainly cardiovascular and from respiratory disease – and a reduction in cold-related deaths as the temperature warms on average.

To which diseases will lead extreme temperatures?

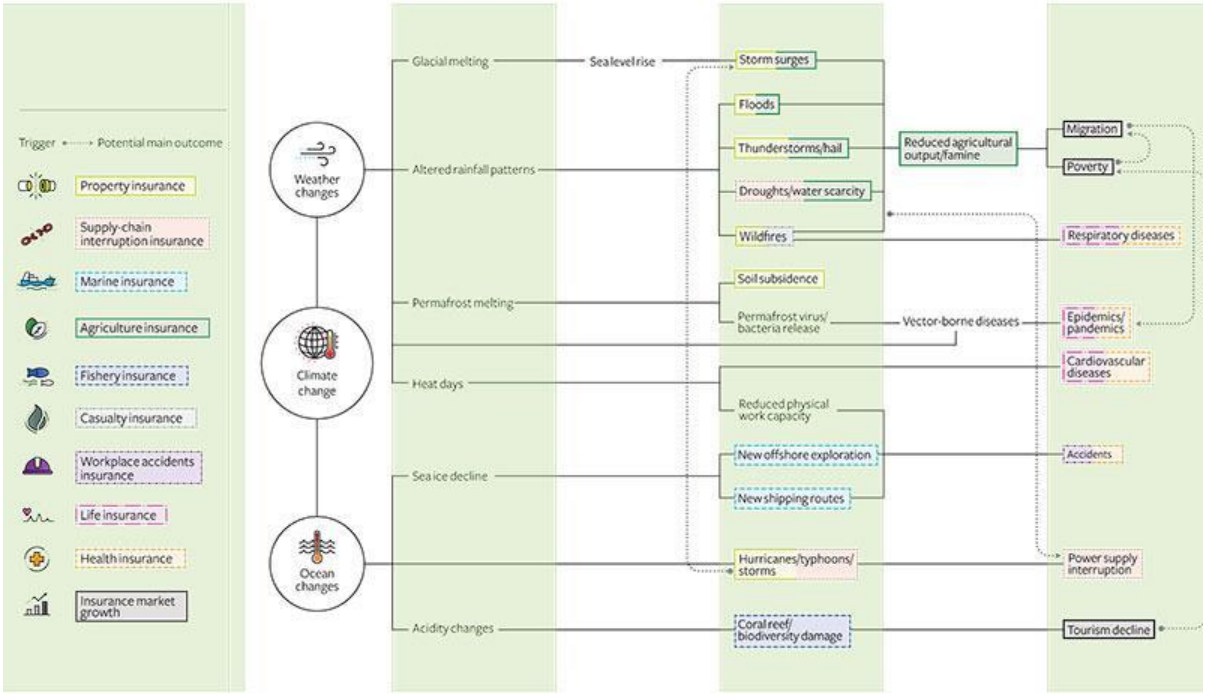
- mainly cardiovascular and respiratory disease

Which negative effect can the use of pesticides have on the nature?

Pesticides can be on or absorbed by crops, or seep into watercourses. Pesticides can also impact on biodiversity which, again, can lead to an increase in zoonotic diseases.

Look at the picture on the next page. Talk about what you can see in the picture and try to give continental examples of your own country. For example: weather changes can lead to floods -> summer of 2021: extreme flooding in the Ardennes in Belgium -> people homeless -> migration

Personal answer.



Full article: Unhealthy planet, unhealthy people

Wednesday 6th October 2021

Richard Purcell and Anna Spender present a selection of experts' opinions on how climate change could affect health, care and protection, drawn from a recent IFoA Health and Care webinar

Building a risk framework

Bernd Wilke,

Senior emerging risk manager, Swiss Re

From respiratory and cardiovascular issues to the increased risk of epidemics, the possible impacts of climate change on health are numerous. Then there are the social and economic impacts: increased migration, poverty, power supply disruption and even tourism decline. The topic is complex, so it is helpful to break it down.

We can start by thinking about individual risk drivers (such as wildfires), then how these might influence ecosystem services (for example air quality), and then the consequent insurance outcomes (such as increased claims for respiratory-

related diseases). A framework like this can help us understand interactions between risk drivers, how they may compound to disrupt various sustainability systems, and which insurance outcomes are most likely or more significant.

Potential actions and reactions of governments and other agencies around climate change and public health should also be factored in, as these can change health outcomes. We have seen from the COVID-19 pandemic how public health restrictions and vaccines completely changed the nature of the pandemic. However, even if public health services and governments want to respond, it's not clear that they will be able to in all situations.

We need to remember that the past cannot be extrapolated to predict future outcomes when it comes to climate change. This is a significant departure from a lot of traditional actuarial work, which relies heavily on past data to inform future modelling. This is an area where actuaries will need to develop their modelling.

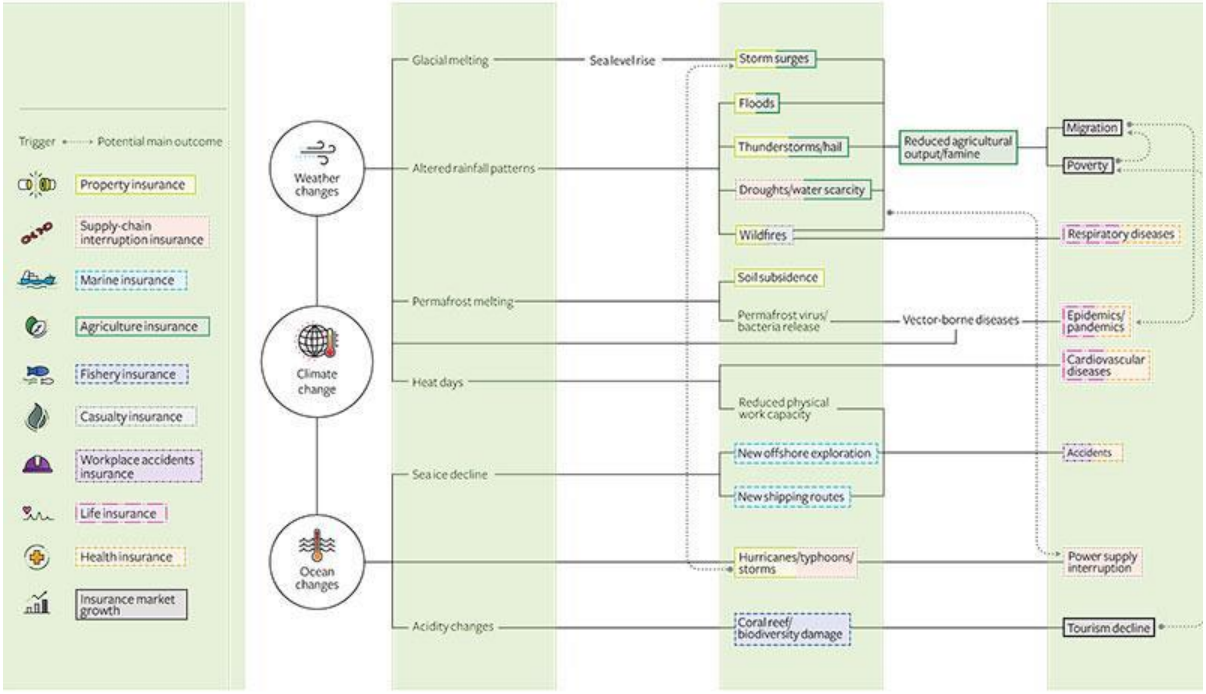


Figure 1: A risk framework for some aspects of climate change.

The impact on health

Nicola Oliver, director, Medical Intelligence

Climate change, health and biodiversity are all related. Consider the chain of events sparked by burning fossil fuels: this creates air pollution, which over time can lead to temperature extremes. This, in turn, can increase the risk of forest fires, and thus the loss of habitat and biodiversity – which can lead to the emergence of zoonotic disease. The increased air pollution from forest fires, can also result in respiratory complications, and particles can also enter our bloodstream, potentially causing other health complications.

Let's look at three specific areas in more detail: air pollution, extreme temperatures, and pesticides.

Air pollution

The short-term health effects of air pollution – such as coughing, shortness of breath and asthma – are well documented. Its long-term effects are perhaps less well understood. It has been shown that particulates could remain in our system for a long time and increase our risk of stroke and cardiovascular disease. Air pollution can also lead to higher rates of lung cancer in non-smokers. Worryingly, even if we can reduce air pollution now, the long-term effects of past pollution will likely persist for some time. From a mortality perspective, long-term exposure to air pollution is estimated to be responsible for 28,000-36,000 deaths a year in the UK alone. Notably, while air pollution is often thought of as an indirect cause of death, the first case of a death resulting directly from air pollution was recently declared in London. This means we may have underestimated the true extent of air pollution's damage to health.

Extreme temperatures

If there is no change in our use of fossil fuels, we would expect to see big increases in the number of hot days each year, and reductions in the number of cold days. That means an increase in heat-related deaths – mainly cardiovascular and from respiratory disease – and a reduction in cold-related deaths as the temperature warms on average. Of course, these impacts will be felt unevenly due to regional differences in extreme temperatures, with hotter areas likely taking a heavier toll.

Pesticides

The pesticides used in agriculture and pest control have wide-ranging health impacts. Pesticides can be on or absorbed by crops, or seep into watercourses. The fact that they can enter the water supply means we can all be exposed to them, even if we choose to eat or buy organic produce. Some pesticides are

carcinogenic to humans and could impact cancer rates. Pesticides can also impact on biodiversity which, again, can lead to an increase in zoonotic diseases.

These three examples show that the health impacts of climate change are not just the ones we tend to think about, such as increased respiratory diseases from air pollution. There can be implications for cancer, cardiovascular and zoonotic diseases, and even dementia, reproductive complications and diabetes.

The Health and Care Climate Change Working Party

Paul Lacock, Chair, Health and Care

Climate Change Working Party

The Health and Care Climate Change Working Party was set up to explore the key climate change impacts that are relevant to health and care actuaries. We have produced an inventory of climate change impacts and risks, and considered what each might mean for the health and care environment: the risk pools, business mix, mortality, morbidity and so on. We then mapped these health and care environment impacts to typical actuarial functions. The idea is not to spoon feed, but to bring attention to what actuaries need to consider. We expect to publish this in due course.

We have also identified topics for further research, for example the impacts of climate change and associated health problems on state-funded healthcare provision. As the nature, magnitude and timing of climate change is difficult to forecast, there will also be a greater need for scenario modelling.

Climate change is a massive interdisciplinary field that draws on dozens of specialised subjects, and we cannot expect actuaries to become climate change experts. Another aspect of the working party's focus has been to consider what support actuaries already have, and what support they will need, in taking climate change into account in their work. Some support, including various documents and guidelines, is already available from the IFoA. These should ideally be harmonised and consolidated. The working party is also considering whether a separate practice guide on climate change is needed for the Health and Care practice area to supplement the Life guide.

Where will you start?

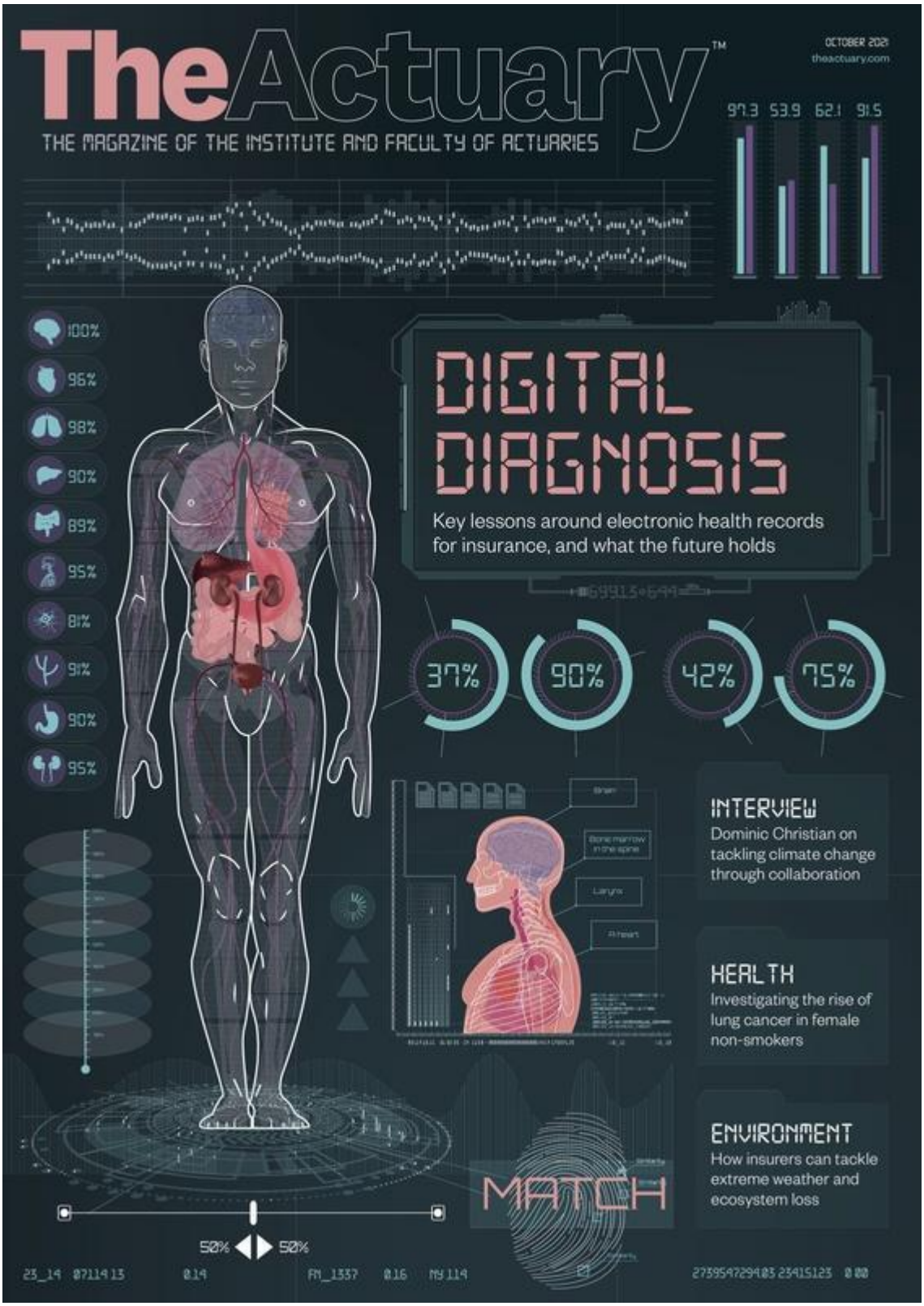
There remains a lot more work for actuaries to do on this important topic. All of us can take our first step by using existing resources to improve our understanding of climate change and sustainability. A good place to start is the IFoA Sustainability and Lifelong Learning page (bit.ly/IFoA_SustLifelong), which includes practical guides and a curated library of information.

It's important that more of us get involved. We encourage you to join us in in taking forward these future areas of work, and furthering our profession's understanding and capabilities.

A recording of the IFoA webinar 'Climate change and sustainability – the health and care discussion' is available on the IFoA website.

Richard Purcell is a member of the IFoA Health and Care Board

Anna Spender is a member of the IFoA Health and Care Board



This article appeared in our October 2021 issue of The Actuary.

Assignment student's manual p. 20

The teacher will score you.

Evaluation criteria	**Outstanding**	**Very good**	**Average**	**Below average**
You give 3 possible impacts of climate change on health.				
You give 4 social and economical impacts of climate change.				
You note down the missing link in the framework.				
You name the short-term health effects of air pollution.				
You name the long-term health effects of air pollution.				
You give the impacts of the use of fossil fuels on the climate.				
You name the diseases to which will lead extreme temperatures.				
You give the negative effect of the use of pesticides on the nature.				
You give continental examples for your own country.				
You understood the text.				
You could read the picture.				

Was went well and what could you do better?

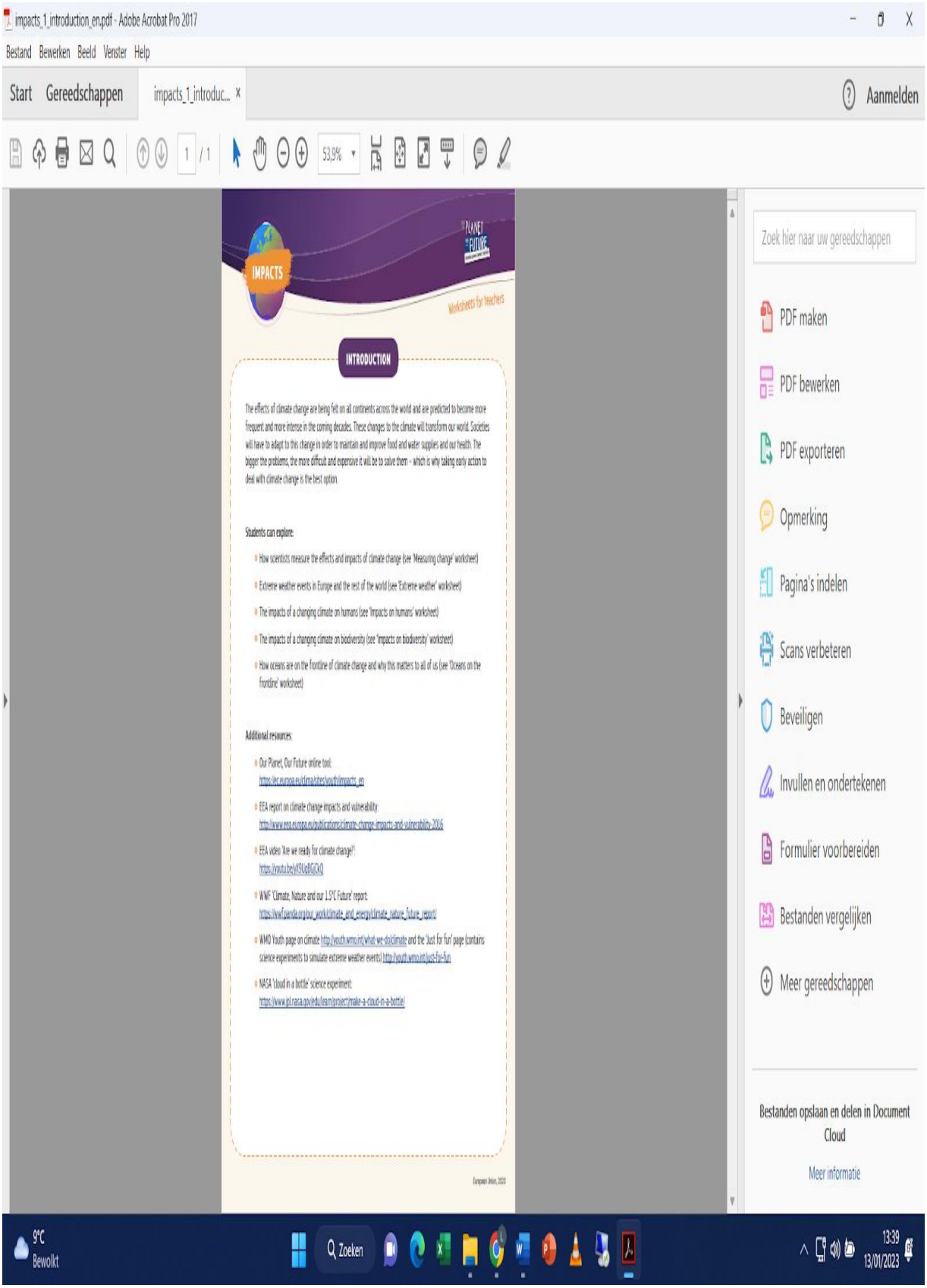
Which strategy did you use to read the text and to answer the questions?

Additional assignment

You will do corner work.
On each corner is a different task that you will complete in groups of 3 pupils.
After 20 minutes, each group moves on to the next corner with a new assignment. There are 5 assignments to complete.
Go to the website: https://ec.europa.eu/clima/sites/youth/impacts_en

On each table you will find the assignment:

Assignment 1: measuring change
Assignment 2: extreme weather
Assignment 3: effects on humans
Assignment 4: effects on biodiversity
Assignment 5: oceans to the frontline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INTRODUCTION
The effects of climate change are being felt on all continents across the world and are predicted to become more frequent and more intense in the coming decades. These changes to the climate will transform our world. Societies will have to adapt to this change in order to maintain and improve food and water supplies and our health. The bigger the problems, the more difficult and expensive it will be to solve them - which is why taking early action to deal with climate change is the best option.
Students can explore:
How scientists measure the effects and impacts of climate change (see 'Measuring change' worksheet)
Extreme weather events in Europe and the rest of the world (see 'Extreme weather' worksheet)
The impacts of a changing climate on humans (see 'Impacts on humans' worksheet)
The impacts of a changing climate on biodiversity (see 'Impacts on biodiversity' worksheet)
How oceans are on the frontline of climate change and why this matters to all of us (see 'Oceans on the frontline' worksheet)
Additional resources:
Our Planet, Our Future online tool:
https://ec.europa.eu/climate/youth/impacts_en
EEA report on climate change impacts and vulnerability:
http://www.eea.europa.eu/publications/climate_change_impacts_and_vulnerability_2016
EEA video 'Are we ready for climate change?':
https://youtu.be/yX9UqB6jCkQ
WWF 'Climate, Nature and our 1.5°C Future' report:
https://wwf.panda.org/our_work/climate_and_energy/climate_nature_future_report/
WMO Youth page on climate http://youth.wmo.int/what-we-do/climate and the 'Just for fun' page (contains science experiments to simulate extreme weather events) http://youth.wmo.int/just-for-fun
NASA 'cloud in a bottle' science experiment:
https://www.jpl.nasa.gov/edu/learn/project/make-a-cloud-in-a-bottle/
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IMPACTS

1. The picture below shows a cross-sectio
and develop growth rings. You can tell the
varies, depending on a variety of things li

Each year, a new layer of wood is added to
ring – a light portion and a darker portion. T
widest because the tree does most of its gr
part, summerwood, is thinner. The tree's gro

Because trees are sensitive to local climate
some information about that area's climate
years usually grow wider, whereas cold, dry
conditions, like a drought, the tree might ha

a. What is the scientific term used to de

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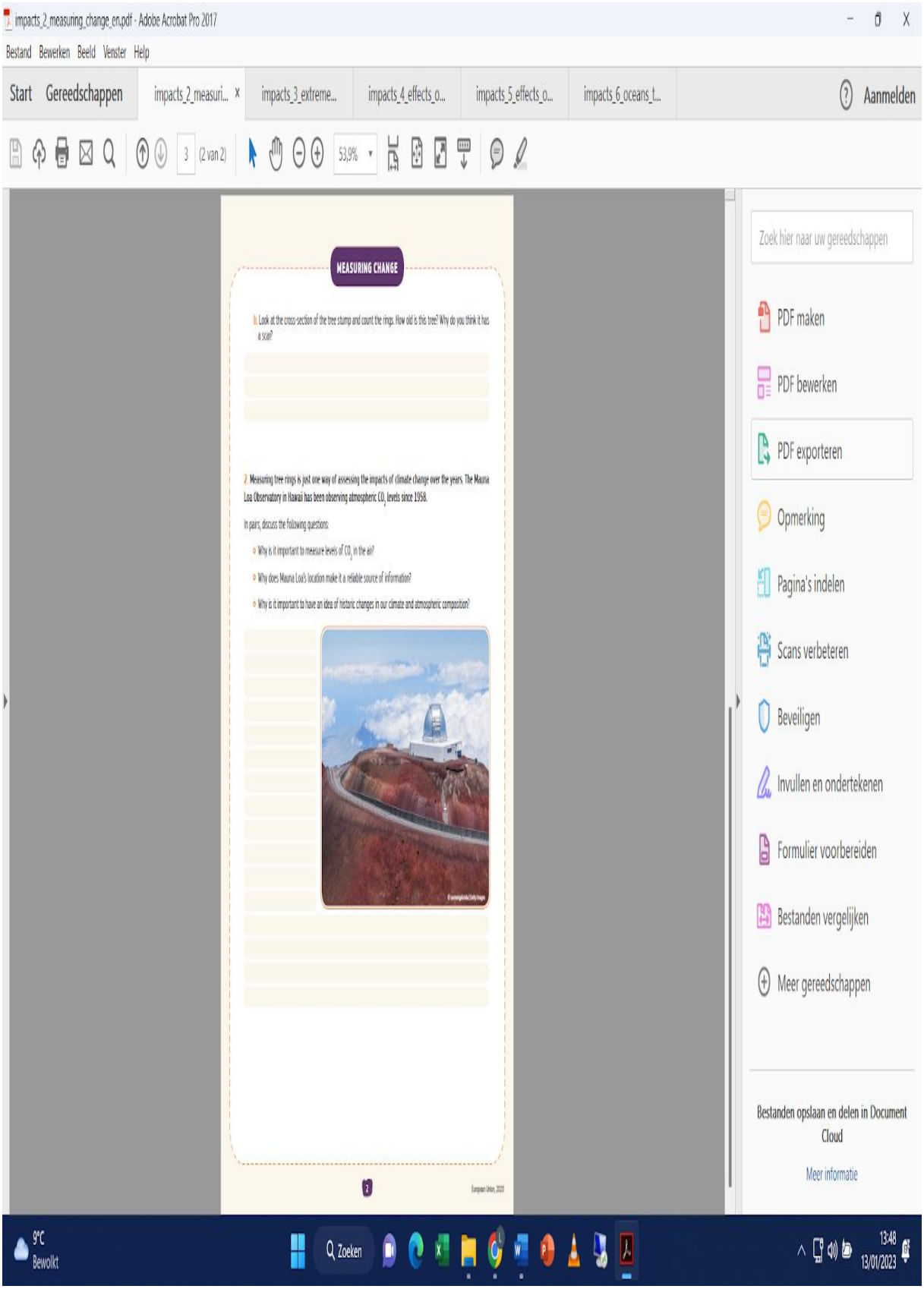
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MEASURING CHANGE
1. Look at the cross-section of the tree stump and count the rings. How old is this tree? Why do you think it has a scar?
2. Measuring tree rings is just one way of assessing the impacts of climate change over the years. The Mauna Loa Observatory in Hawaii has been observing atmospheric CO_2 levels since 1958.
In pairs, discuss the following questions:
Why is it important to measure levels of CO_2 in the air?
Why does Mauna Loa's location make it a reliable source of information?
Why is it important to have an idea of historic changes in our climate and atmospheric composition?
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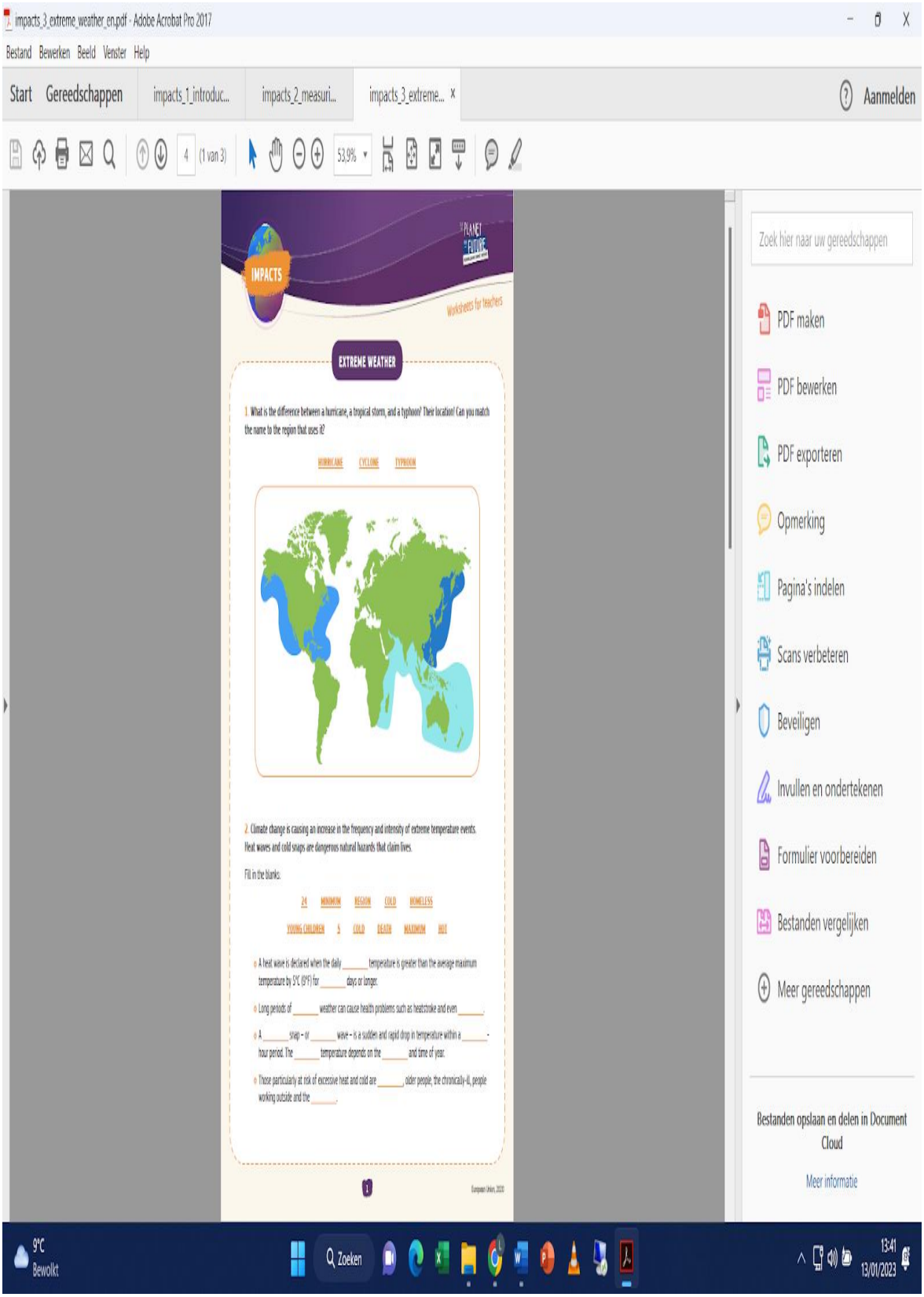
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IMPACTS
Worksheets for teachers
EXTREME WEATHER
1. What is the difference between a hurricane, a tropical storm, and a typhoon? Their location! Can you match the name to the region that uses it?
HURRICANE CYCLONE TYPHOON
2. Climate change is causing an increase in the frequency and intensity of extreme temperature events. Heat waves and cold snaps are dangerous natural hazards that claim lives.
Fill in the blanks:
24 MINIMUM REGION COLD HOMELESS
YOUNG CHILDREN 5 COLD DEATH MAXIMUM HOT
A heat wave is declared when the daily _____ temperature is greater than the average maximum temperature by 5°C (9°F) for _____ days or longer.
Long periods of _____ weather can cause health problems such as heatstroke and even _____.
A _____ snap - or _____ wave - is a sudden and rapid drop in temperature within a _____-hour period. The _____ temperature depends on the _____ and time of year.
Those particularly at risk of excessive heat and cold are _____, older people, the chronically-ill, people working outside and the _____.
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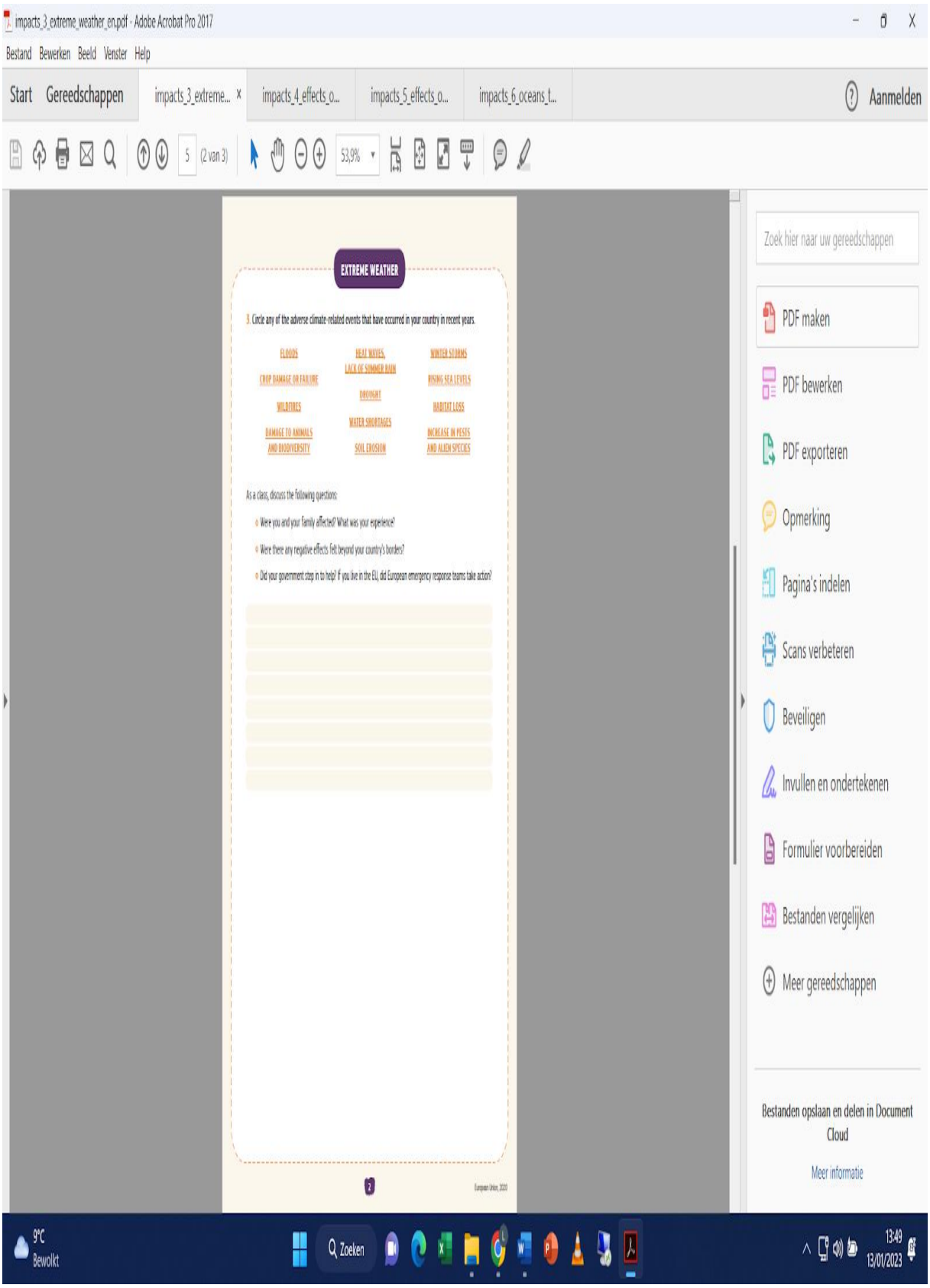
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EXTREME WEATHER
3. Circle any of the adverse climate-related events that have occurred in your country in recent years.
FLOODS
CROP DAMAGE OR FAILURE
WILDFIRES
DAMAGE TO ANIMALS AND BIODIVERSITY
HEAT WAVES, LACK OF SUMMER RAIN
DROUGHT
WATER SHORTAGES
SOIL EROSION
WINTER STORMS
RISING SEA LEVELS
HABITAT LOSS
INCREASE IN PESTS AND ALIEN SPECIES
As a class, discuss the following questions:
Were you and your family affected? What was your experience?
Were there any negative effects felt beyond your country's borders?
Did your government step in to help? If you live in the EU, did European emergency response teams take action?
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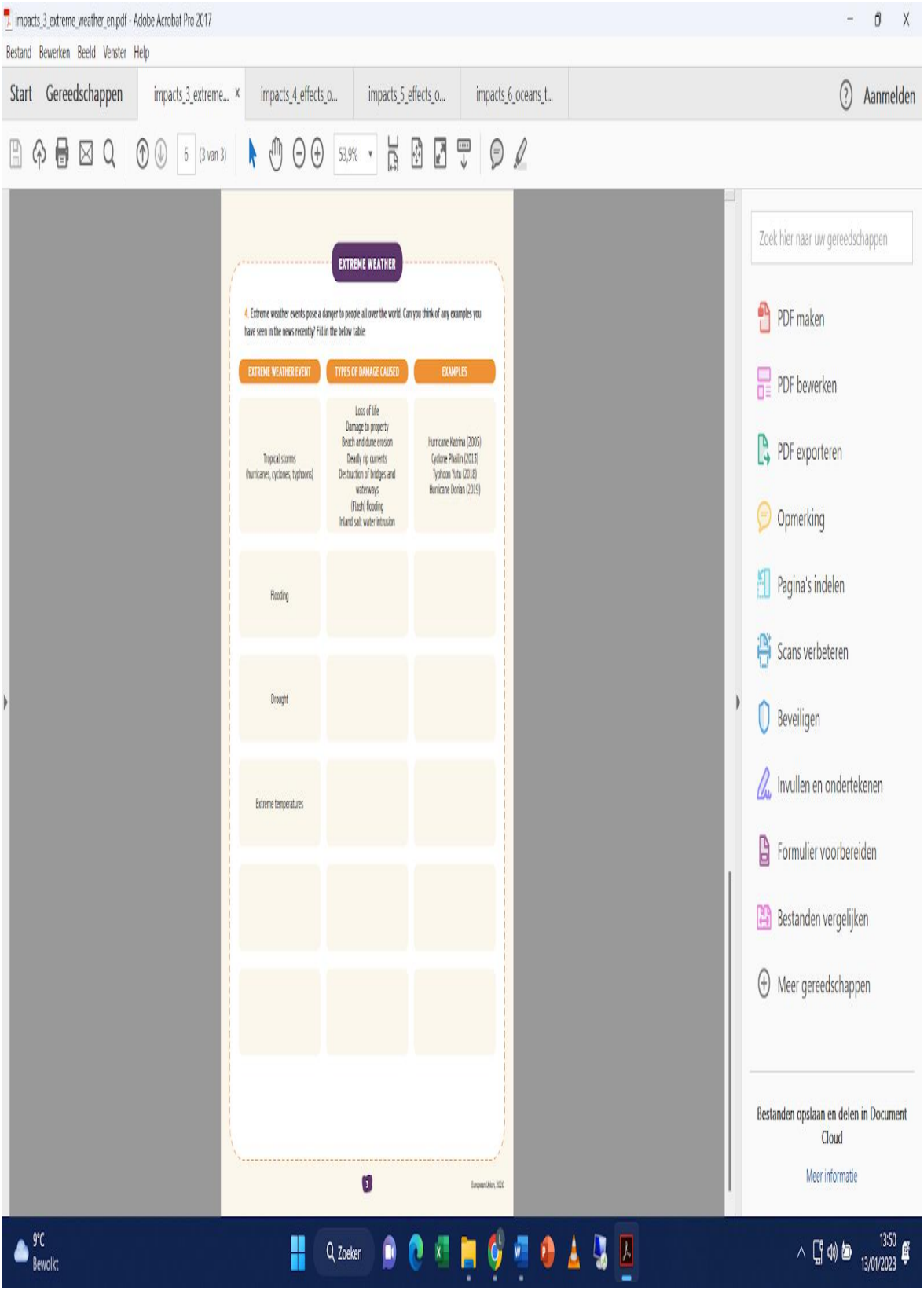
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EXTREME WEATHER
4. Extreme weather events pose a danger to people all over the world. Can you think of any examples you have seen in the news recently? Fill in the below table:
EXTREME WEATHER EVENT
TYPES OF DAMAGE CAUSED
EXAMPLES
Tropical storms (hurricanes, cyclones, typhoons)
Loss of life
Damage to property
Beach and dune erosion
Deadly rip currents
Destruction of bridges and waterways
(Flash) flooding
Inland salt water intrusion
Hurricane Katrina (2005)
Cyclone Phailin (2013)
Typhoon Yutu (2018)
Hurricane Dorian (2019)
Flooding
Drought
Extreme temperatures
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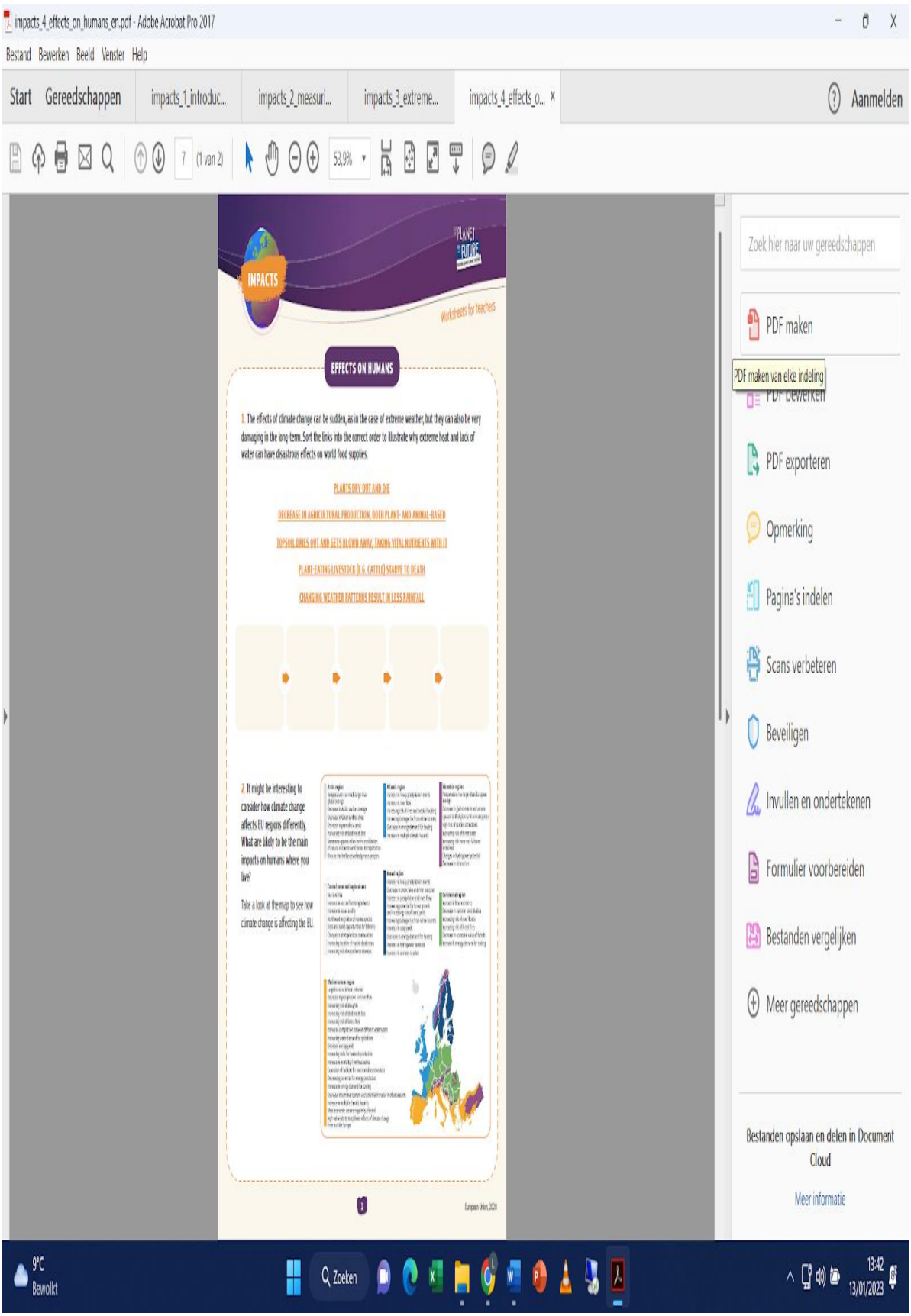
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IMPACTS
Worksheets for teachers
EFFECTS ON HUMANS
1. The effects of climate change can be sudden, as in the case of extreme weather, but they can also be very damaging in the long-term. Sort the links into the correct order to illustrate why extreme heat and lack of water can have disastrous effects on world food supplies.
PLANTS DRY OUT AND DIE
DECREASE IN AGRICULTURAL PRODUCTION, BOTH PLANT- AND ANIMAL-BASED
TOPSOIL DRIES OUT AND GETS BLOWN AWAY, TAKING VITAL NUTRIENTS WITH IT
PLANT-EATING LIVESTOCK (E.G. CATTLE) STARVE TO DEATH
CHANGING WEATHER PATTERNS RESULT IN LESS RAINFALL
2. It might be interesting to consider how climate change affects EU regions differently. What are likely to be the main impacts on humans where you live?
Take a look at the map to see how climate change is affecting the EU.
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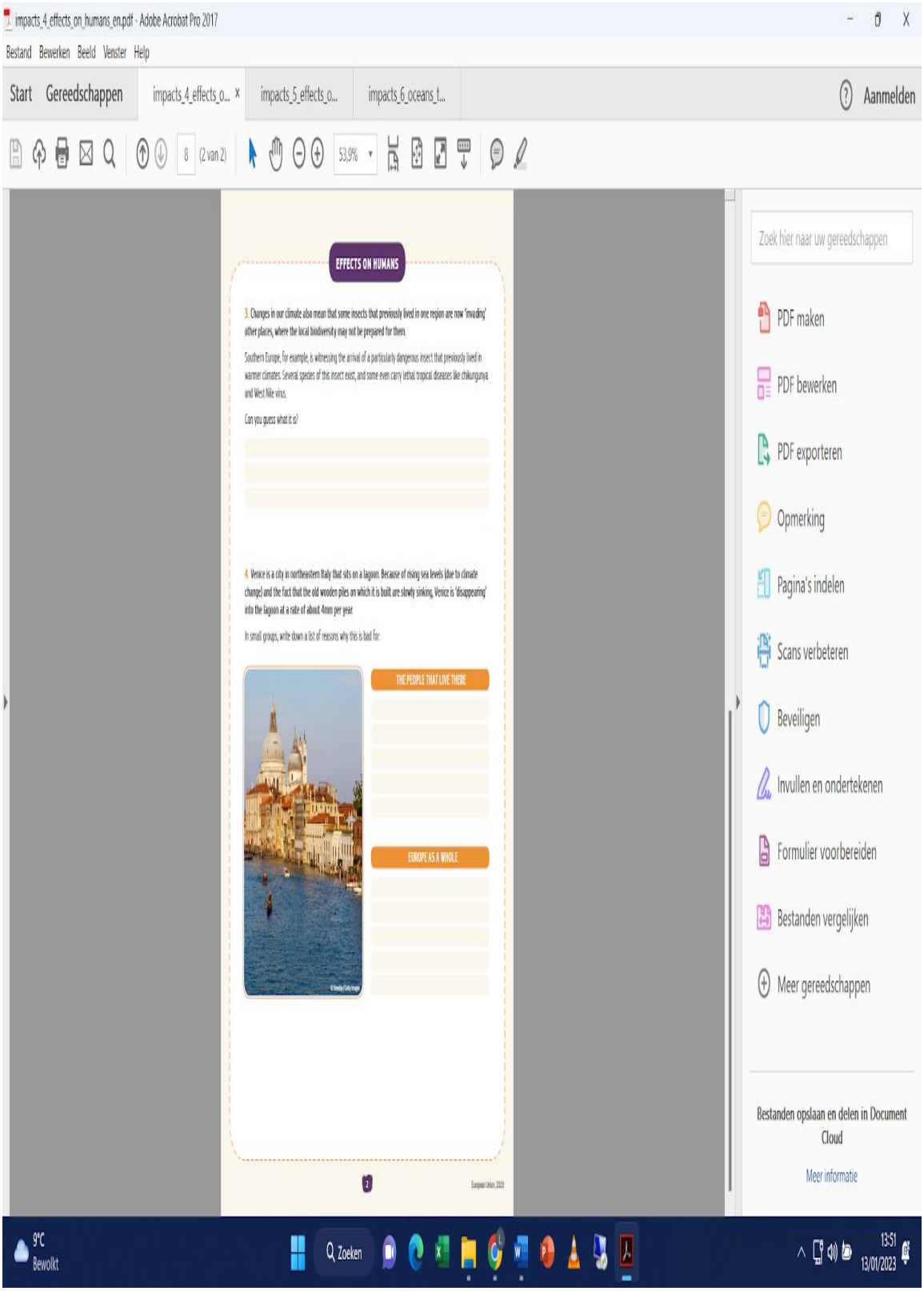
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EFFECTS ON HUMANS
3. Changes in our climate also mean that some insects that previously lived in one region are now 'invading' other places, where the local biodiversity may not be prepared for them.
Southern Europe, for example, is witnessing the arrival of a particularly dangerous insect that previously lived in warmer climates. Several species of this insect exist, and some even carry lethal tropical diseases like chikungunya and West Nile virus.
Can you guess what it is?
4. Venice is a city in northeastern Italy that sits on a lagoon. Because of rising sea levels (due to climate change) and the fact that the old wooden piles on which it is built are slowly sinking, Venice is 'disappearing' into the lagoon at a rate of about 4mm per year.
In small groups, write down a list of reasons why this is bad for:
THE PEOPLE THAT LIVE THERE
EUROPE AS A WHOLE
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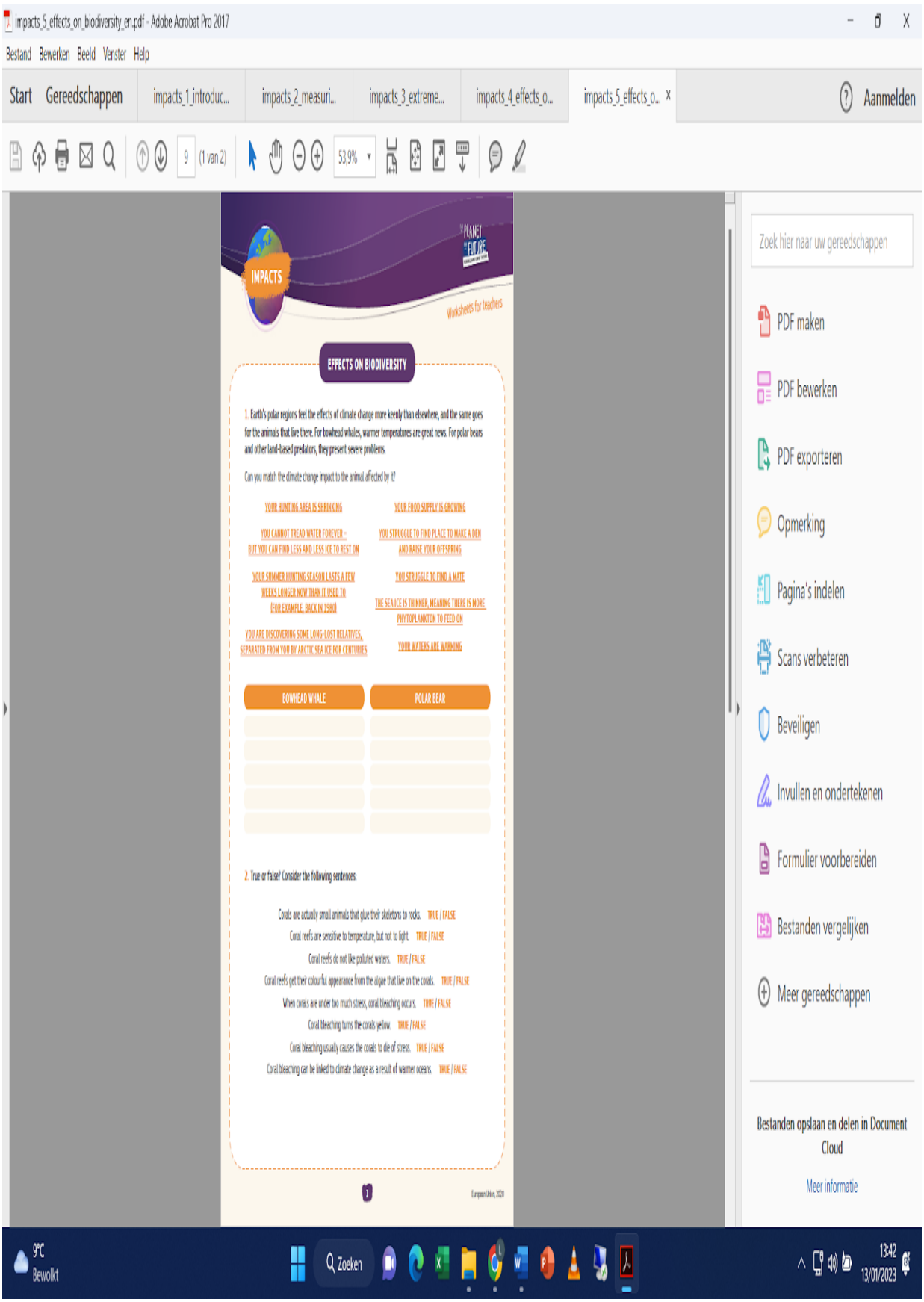
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IMPACTS
Worksheets for teachers
EFFECTS ON BIODIVERSITY
1. Earth's polar regions feel the effects of climate change more keenly than elsewhere, and the same goes for the animals that live there. For bowhead whales, warmer temperatures are great news. For polar bears and other land-based predators, they present severe problems.
Can you match the climate change impact to the animal affected by it?
YOUR HUNTING AREA IS SHRINKING
YOUR FOOD SUPPLY IS GROWING
YOU CANNOT TREAD WATER FOREVER – BUT YOU CAN FIND LESS AND LESS ICE TO REST ON
YOU STRUGGLE TO FIND PLACE TO MAKE A DEN AND RAISE YOUR OFFSPRING
YOUR SUMMER HUNTING SEASON LASTS A FEW WEEKS LONGER NOW THAN IT USED TO (FOR EXAMPLE, BACK IN 1980)
YOU STRUGGLE TO FIND A MATE
THE SEA ICE IS THINNER, MEANING THERE IS MORE PHYTOPLANKTON TO FEED ON
YOU ARE DISCOVERING SOME LONG LOST RELATIVES, SEPARATED FROM YOU BY ARCTIC SEA ICE FOR CENTURIES
YOUR WATERS ARE WARMING
BOWHEAD WHALE
POLAR BEAR
2. True or false? Consider the following sentences:
Corals are actually small animals that glue their skeletons to rocks. TRUE / FALSE
Coral reefs are sensitive to temperature, but not to light. TRUE / FALSE
Coral reefs do not like polluted waters. TRUE / FALSE
Coral reefs get their colourful appearance from the algae that live on the corals. TRUE / FALSE
When corals are under too much stress, coral bleaching occurs. TRUE / FALSE
Coral bleaching turns the corals yellow. TRUE / FALSE
Coral bleaching usually causes the corals to die of stress. TRUE / FALSE
Coral bleaching can be linked to climate change as a result of warmer oceans. TRUE / FALSE
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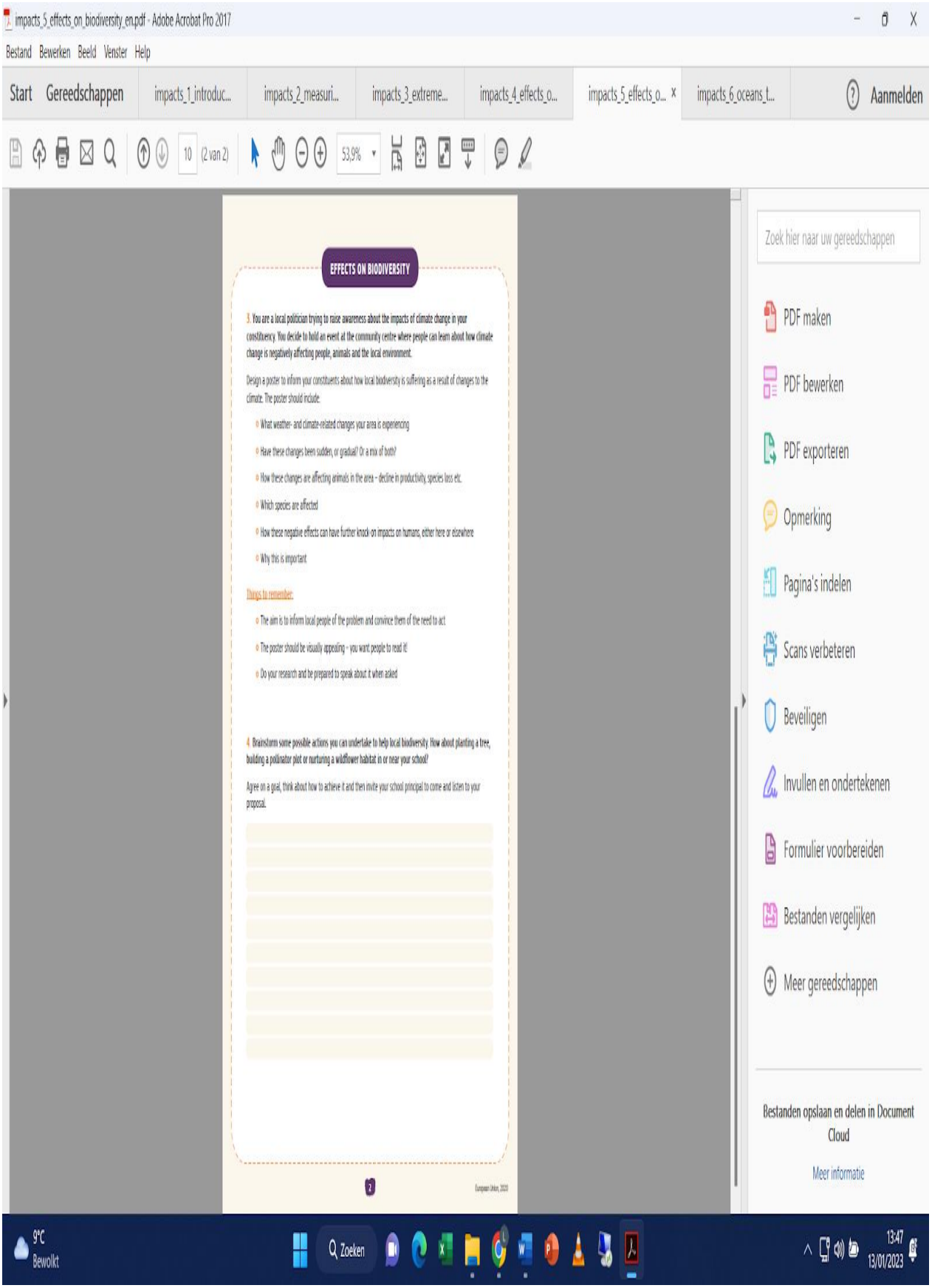
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EFFECTS ON BIODIVERSITY
3. You are a local politician trying to raise awareness about the impacts of climate change in your constituency. You decide to hold an event at the community centre where people can learn about how climate change is negatively affecting people, animals and the local environment.
Design a poster to inform your constituents about how local biodiversity is suffering as a result of changes to the climate. The poster should include:
What weather- and climate-related changes your area is experiencing
Have these changes been sudden, or gradual? Or a mix of both?
How these changes are affecting animals in the area - decline in productivity, species loss etc.
Which species are affected
How these negative effects can have further knock-on impacts on humans, either here or elsewhere
Why this is important
Things to remember:
The aim is to inform local people of the problem and convince them of the need to act
The poster should be visually appealing - you want people to read it!
Do your research and be prepared to speak about it when asked
4. Brainstorm some possible actions you can undertake to help local biodiversity. How about planting a tree, building a pollinator plot or nurturing a wildflower habitat in or near your school?
Agree on a goal, think about how to achieve it and then invite your school principal to come and listen to your proposal.
2
European Union, 2020
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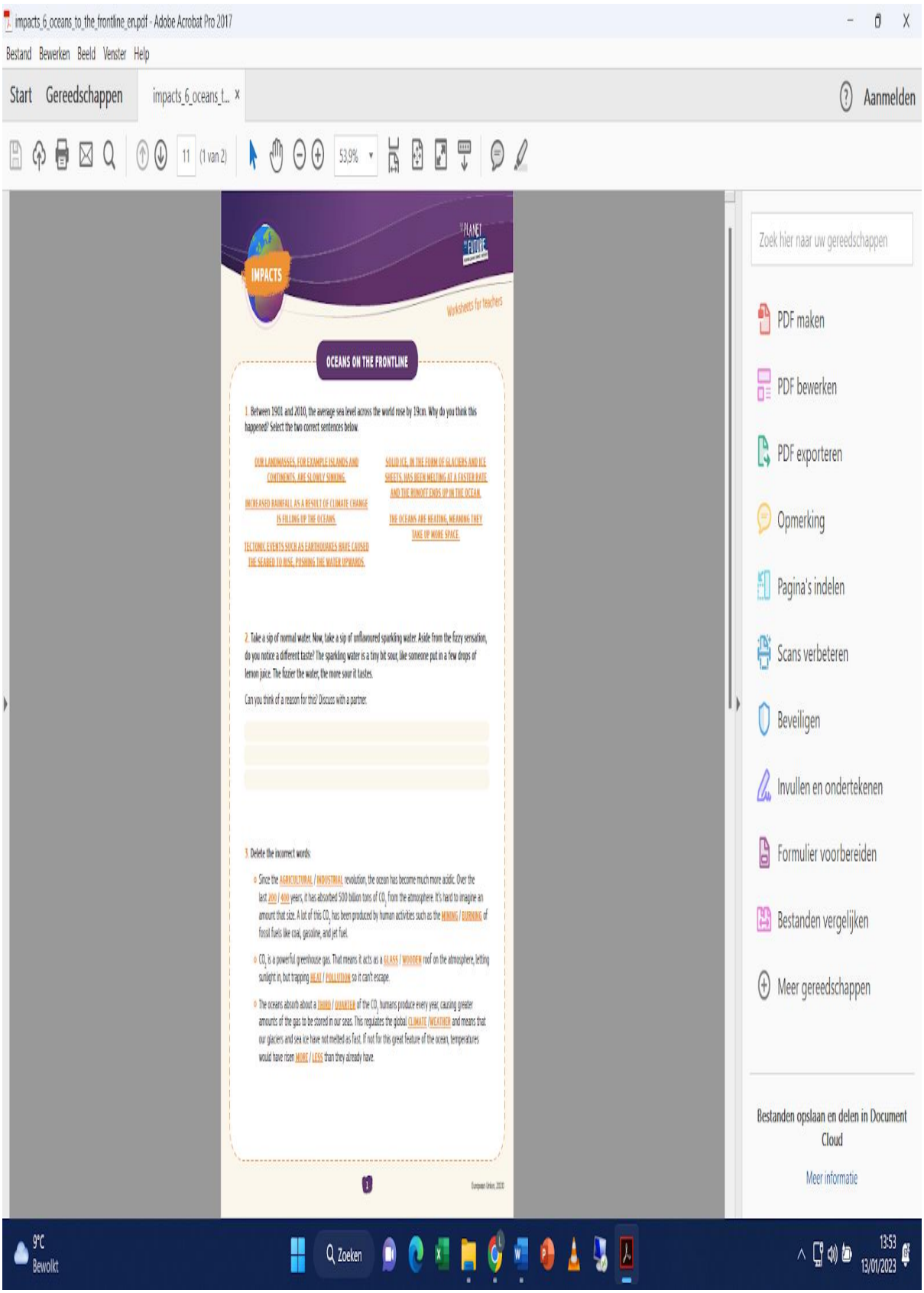
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IMPACTS
Worksheets for teachers
OCEANS ON THE FRONTLINE
1. Between 1901 and 2010, the average sea level across the world rose by 19cm. Why do you think this happened? Select the two correct sentences below.
OUR LANDMASSES, FOR EXAMPLE ISLANDS AND CONTINENTS, ARE SLOWLY SINKING.
SOLID ICE, IN THE FORM OF GLACIERS AND ICE SHEETS, HAS BEEN MELTING AT A FASTER RATE AND THE RUNOFF ENDS UP IN THE OCEAN.
INCREASED RAINFALL AS A RESULT OF CLIMATE CHANGE IS FILLING UP THE OCEANS.
THE OCEANS ARE HEATING, MEANING THEY TAKE UP MORE SPACE.
TECTONIC EVENTS SUCH AS EARTHQUAKES HAVE CAUSED THE SEABED TO RISE, PUSHING THE WATER UPWARDS.
2. Take a sip of normal water. Now, take a sip of unflavoured sparkling water. Aside from the fizzy sensation, do you notice a different taste? The sparkling water is a tiny bit sour, like someone put in a few drops of lemon juice. The fizzier the water, the more sour it tastes.
Can you think of a reason for this? Discuss with a partner.
3. Delete the incorrect words:
Since the AGRICULTURAL / INDUSTRIAL revolution, the ocean has become much more acidic. Over the last 200 / 400 years, it has absorbed 500 billion tons of CO_2 from the atmosphere. It's hard to imagine an amount that size. A lot of this CO_2 has been produced by human activities such as the MINING / BURNING of fossil fuels like coal, gasoline, and jet fuel.
CO_2 is a powerful greenhouse gas. That means it acts as a GLASS / WOODEN roof on the atmosphere, letting sunlight in, but trapping HEAT / POLLUTION so it can't escape.
The oceans absorb about a THIRD / QUARTER of the CO_2 humans produce every year, causing greater amounts of the gas to be stored in our seas. This regulates the global CLIMATE / WEATHER and means that our glaciers and sea ice have not melted as fast. If not for this great feature of the ocean, temperatures would have risen MORE / LESS than they already have.
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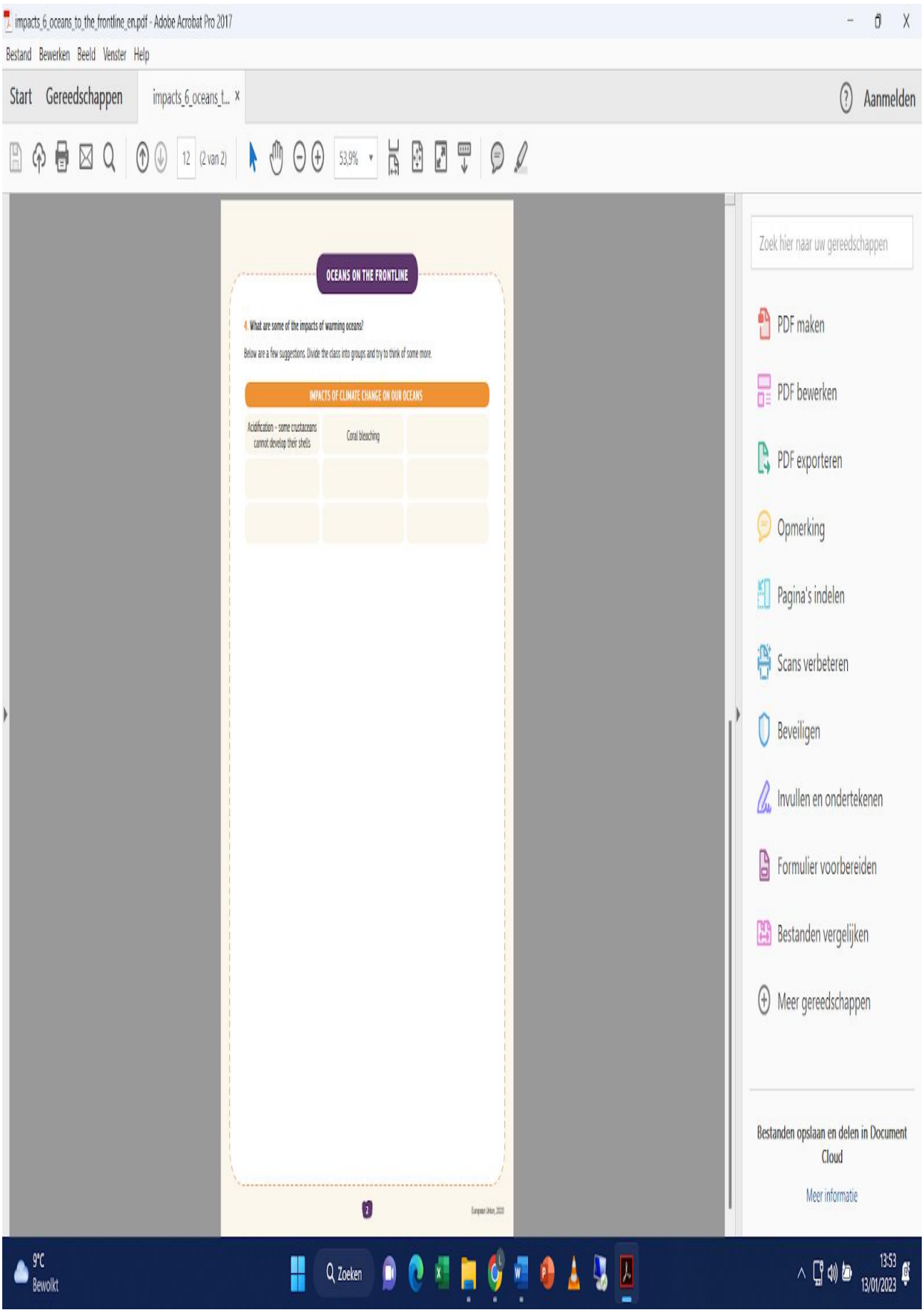
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OCEANS ON THE FRONTLINE
4. What are some of the impacts of warming oceans?
Below are a few suggestions. Divide the class into groups and try to think of some more.
IMPACTS OF CLIMATE CHANGE ON OUR OCEANS
Acidification - some crustaceans cannot develop their shells
Coral bleaching
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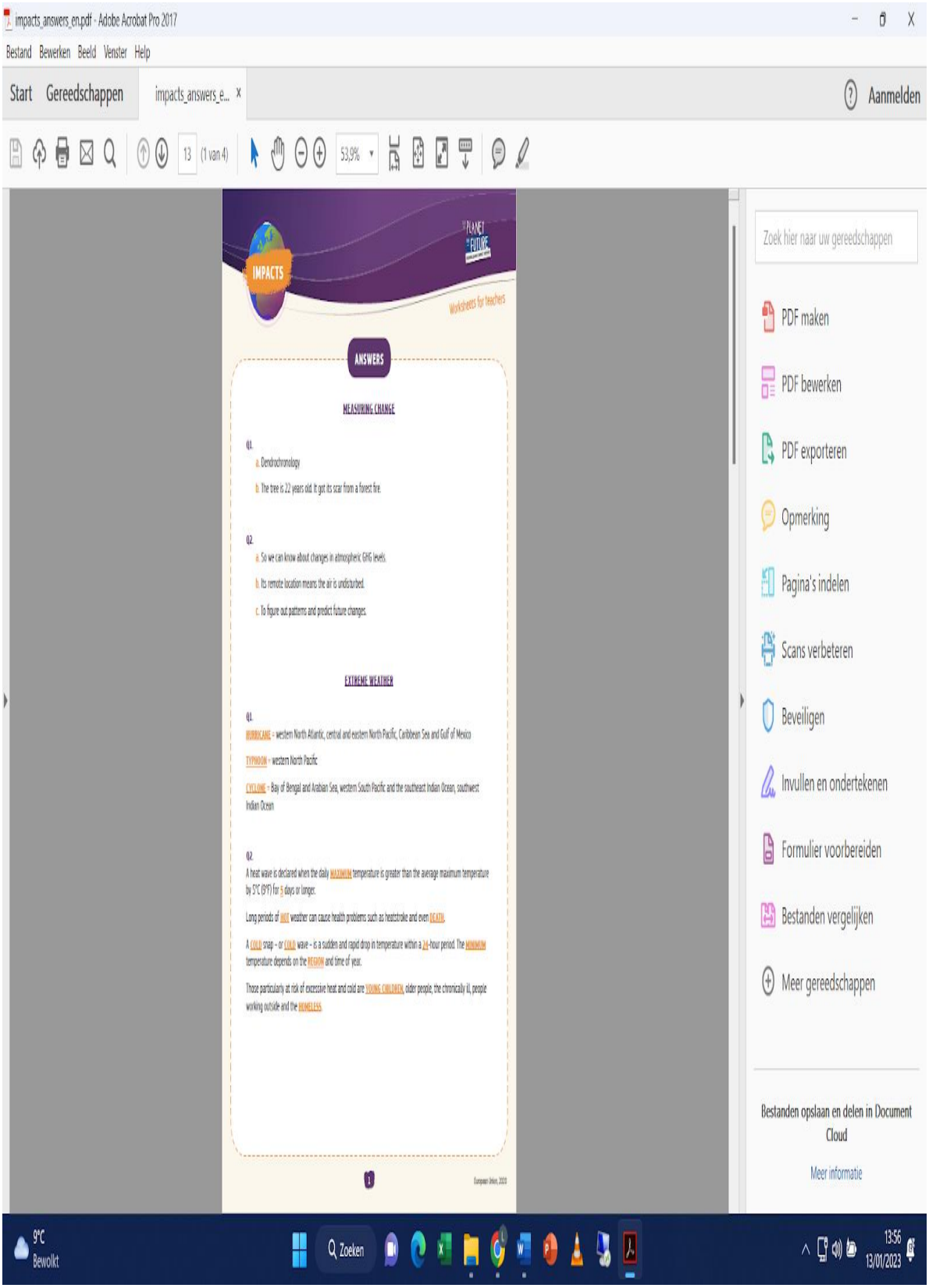
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IMPACTS
Worksheets for teachers
ANSWERS
MEASURING CHANGE
01.
a. Dendrochronology
b. The tree is 22 years old. It got its scar from a forest fire.
02.
a. So we can know about changes in atmospheric GHG levels.
b. Its remote location means the air is undisturbed.
c. To figure out patterns and predict future changes.
EXTREME WEATHER
01.
HURRICANE - western North Atlantic, central and eastern North Pacific, Caribbean Sea and Gulf of Mexico
TYPHOON - western North Pacific
CYCLONE - Bay of Bengal and Arabian Sea, western South Pacific and the southeast Indian Ocean, southwest Indian Ocean
02.
A heat wave is declared when the daily MAXIMUM temperature is greater than the average maximum temperature by 5°C (9°F) for 5 days or longer.
Long periods of HOT weather can cause health problems such as heatstroke and even DEATH.
A COLD snap - or COLD wave - is a sudden and rapid drop in temperature within a 24-hour period. The MINIMUM temperature depends on the REGION and time of year.
Those particularly at risk of excessive heat and cold are YOUNG CHILDREN, older people, the chronically ill, people working outside and the HOMELESS.
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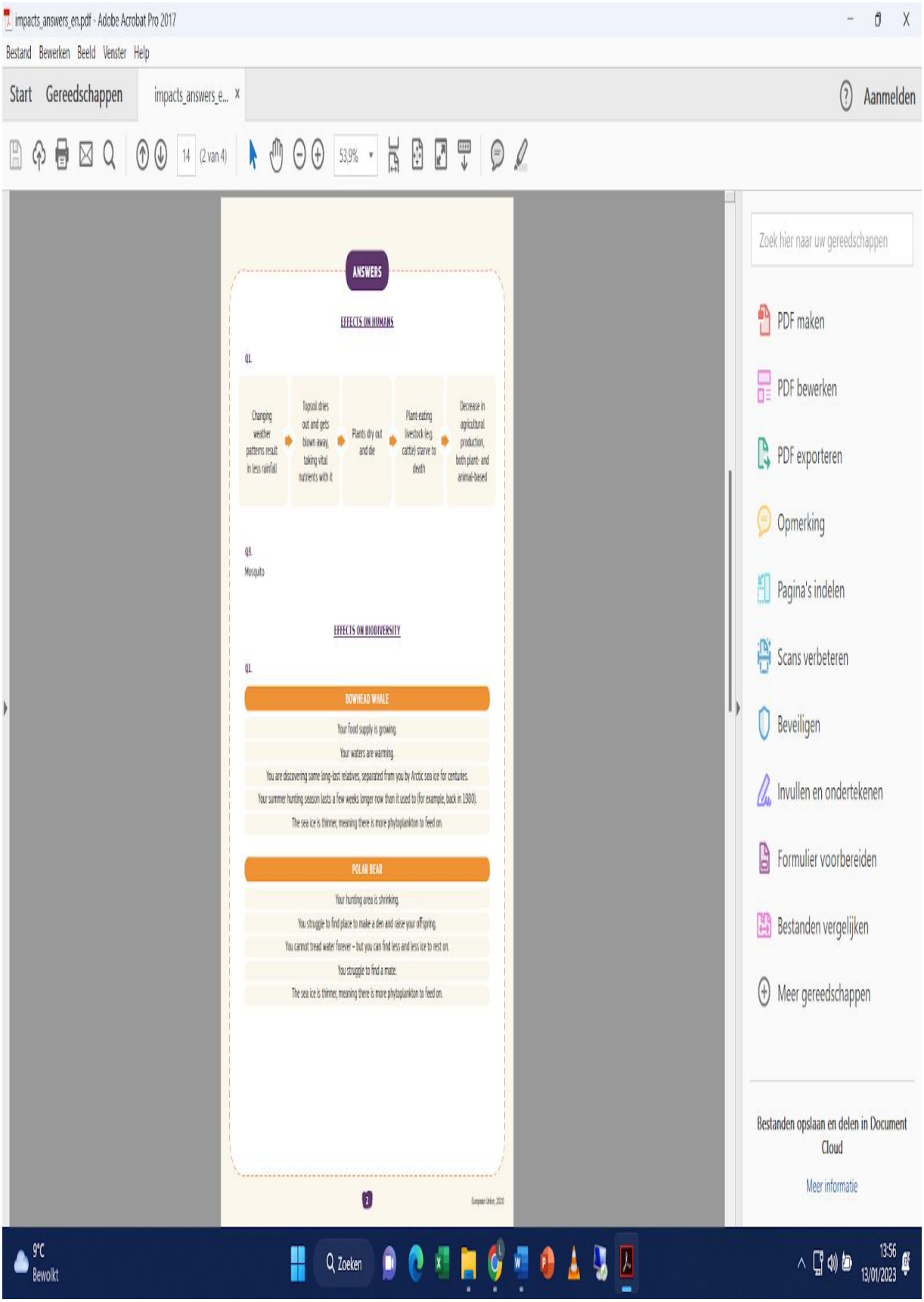
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ANSWERS
EFFECTS ON HUMANS
Q1.
Changing weather patterns result in less rainfall
Topsoil dries out and gets blown away, taking vital nutrients with it
Plants dry out and die
Plant-eating livestock (e.g. cattle) starve to death
Decrease in agricultural production, both plant- and animal-based
Q3.
Mosquito
EFFECTS ON BIODIVERSITY
Q1.
BOWHEAD WHALE
Your food supply is growing.
Your waters are warming.
You are discovering some long-lost relatives, separated from you by Arctic sea ice for centuries.
Your summer hunting season lasts a few weeks longer now than it used to (for example, back in 1980).
The sea ice is thinner, meaning there is more phytoplankton to feed on.
POLAR BEAR
Your hunting area is shrinking.
You struggle to find place to make a den and raise your offspring.
You cannot tread water forever - but you can find less and less ice to rest on.
You struggle to find a mate.
The sea ice is thinner, meaning there is more phytoplankton to feed on.
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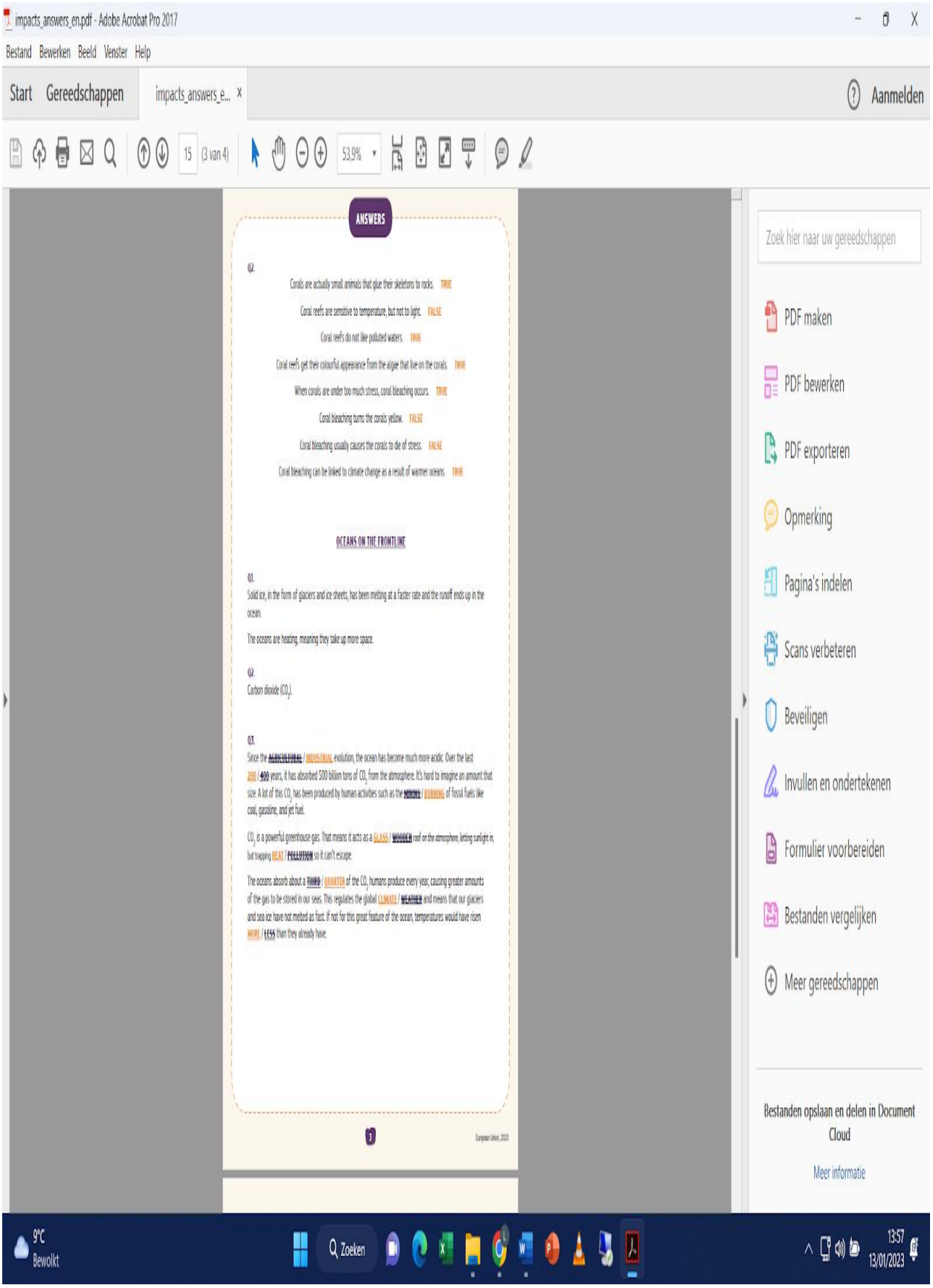
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ANSWERS
Q2.
Corals are actually small animals that glue their skeletons to rocks. TRUE
Coral reefs are sensitive to temperature, but not to light. FALSE
Coral reefs do not like polluted waters. TRUE
Coral reefs get their colourful appearance from the algae that live on the corals. TRUE
When corals are under too much stress, coral bleaching occurs. TRUE
Coral bleaching turns the corals yellow. FALSE
Coral bleaching usually causes the corals to die of stress. FALSE
Coral bleaching can be linked to climate change as a result of warmer oceans. TRUE
OCEANS ON THE FRONTLINE
Q1.
Solid ice, in the form of glaciers and ice sheets, has been melting at a faster rate and the runoff ends up in the ocean.
The oceans are heating, meaning they take up more space.
Q2.
Carbon dioxide (CO_2).
Q3.
Since the AGRICULTURAL / INDUSTRIAL evolution, the ocean has become much more acidic. Over the last 200 / 400 years, it has absorbed 500 billion tons of CO_2 from the atmosphere. It's hard to imagine an amount that size. A lot of this CO_2 has been produced by human activities such as the MINING / BURNING of fossil fuels like coal, gasoline, and jet fuel.
CO_2 is a powerful greenhouse gas. That means it acts as a GLASS / WOODEN roof on the atmosphere, letting sunlight in, but trapping HEAT / POLLUTION so it can't escape.
The oceans absorb about a THIRD / QUARTER of the CO_2 humans produce every year, causing greater amounts of the gas to be stored in our seas. This regulates the global CLIMATE / WEATHER and means that our glaciers and sea ice have not melted as fast. If not for this great feature of the ocean, temperatures would have risen MORE / LESS than they already have.
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European Union, 2020
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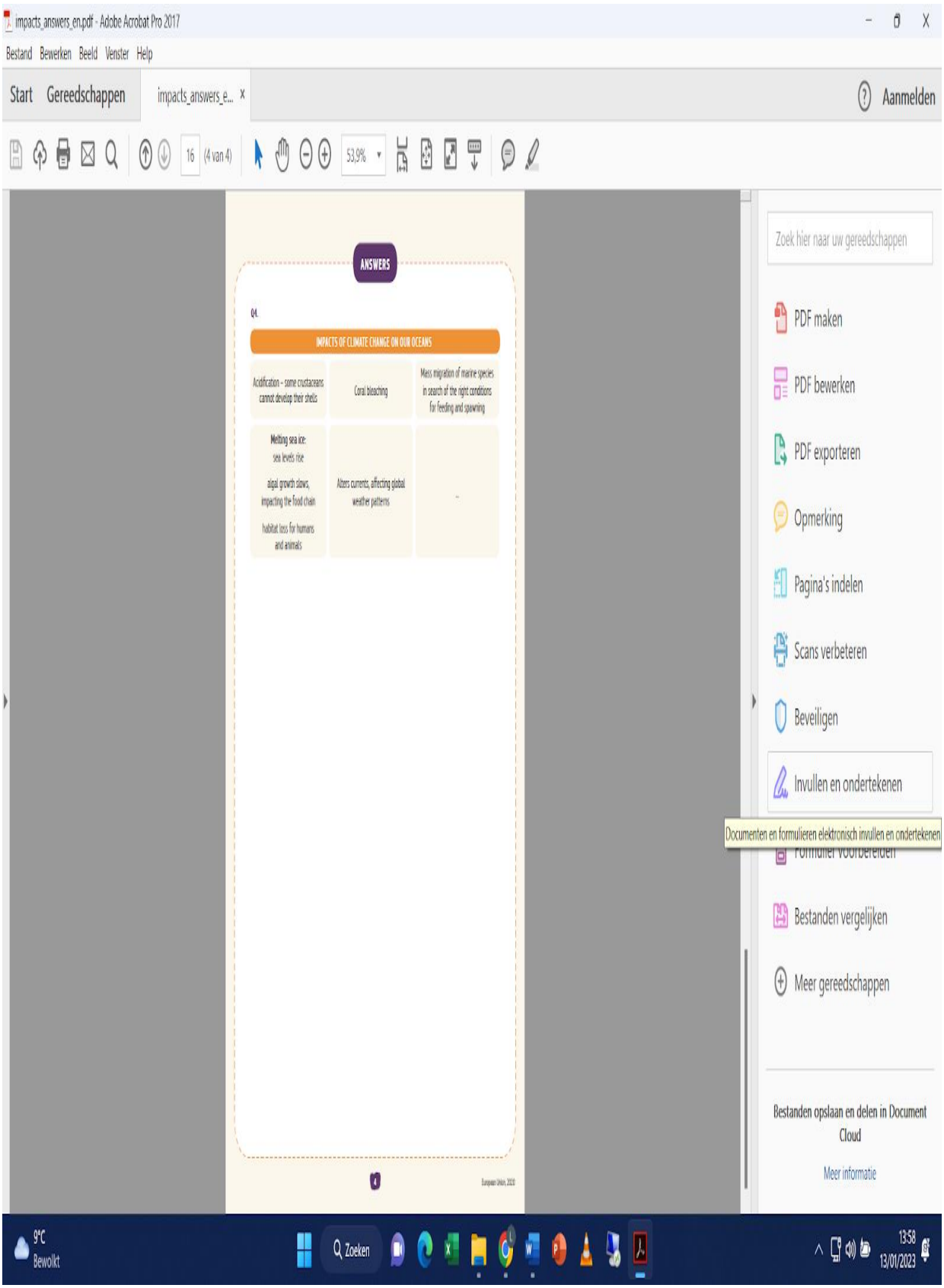
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ANSWERS
Q4.
IMPACTS OF CLIMATE CHANGE ON OUR OCEANS
Acidification - some crustaceans cannot develop their shells
Coral bleaching
Mass migration of marine species in search of the right conditions for feeding and spawning
Melting sea ice: sea levels rise
algal growth slows, impacting the food chain
habitat loss for humans and animals
Alters currents, affecting global weather patterns
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1.3 Assignments + solutions + evaluation forms – Climate conferences and sustainable development goals

student's manual: p. 23

Check the website: https://www.un.org/en/climatechange/paris-agreement and name the 3 key elements of the Paris Agreement.

3 key elements of the Paris Agreement

student's manual: p. 23

Check the website: https://www.un.org/en/climatechange/paris-agreement and name the 3 key elements of the Paris Agreement.

3 key elements of the Paris Agreement
limit temperature rise to 1.5°C
review countries' commitments to cutting emissions every five years
provide climate finance to developing countries

student's manual: p. 24

Look at the small video on YouTube and answer the key questions.

https://www.youtube.com/watch?v=b6qPnu82OVU

When did the United Nations approve the Agenda 2030?

What is the main purpose of the sustainable development goals or SDG's?

To which 5 P's do the SDG's relate?

Define the 17 goals.

Symbol	What do they mean exactly?
	
	
	
	
	
	

 7 AFFORDABLE AND CLEAN ENERGY	
 8 DECENT WORK AND ECONOMIC GROWTH	
 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	
 10 REDUCED INEQUALITIES	
 11 SUSTAINABLE CITIES AND COMMUNITIES	
 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	
 13 CLIMATE ACTION	

If we go back to one of the goals of the project "Future skills for a better life", namely sustainability and to be able to have more "Sustainable Salons" in the future, which of the SDG's may then seem important to you? Why?

student's manual: p. 24

Look at the small video on YouTube and answer the key questions.

https://www.youtube.com/watch?v=b6qPnu82OVU

When did the United Nations approve the Agenda 2030?
In September 2015.

What is the main purpose of the sustainable development goals or SDG's?
To develop and keep this world a place for everyone to enjoy.

To which 5 P's do the SDG's relate?

- people
- planet
- prosperity
- peace
- partnership

Define the 17 goals.

Symbol	What do they mean exactly?
	to end poverty in all its forms everywhere
	achieve food security and improve nutrition and promote a sustainable agriculture
	ensure healthy lives and promote wellbeing for all at all ages
	ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
	achieve gender equality and empower all women and girls

	
	ensure availability and sustainable management of water and sanitation for all
	ensure access to affordable reliable sustainable and modern energy for all
	promote a sustained inclusive and sustainable economic growth, full and productive employment and decent work for all
	build resilient infrastructure promote inclusive and sustainable industrialization and foster innovation
	reduce inequality within and among countries
	make cities and human settlements inclusive safe resilient and sustainable

	ensure sustainable consumption and production patterns
	take urgent action to combat climate change and it's impacts
	conserve and sustainably use the oceans, seas and marine resources for sustainable development
	protect, restore and promote sustainable use of terrestrial ecosystems sustainably managed forests combat desertification and halt and reverse land of degradation and halt biodiversity loss
	promote peaceful and inclusive societies for sustainable development provide access to justice for all and build effective, accountable and inclusive institutions at all levels
	strengthen the means of implementation and revitalize the global partnership for sustainable development

If we go back to one of the goals of the project "Future skills for a better life", namely sustainability and to be able to have more "Sustainable Salons" in the future, which of the SDG's may then seem important to you? Why?

Personal answer.

Assignment student's manual p. 24

Evaluate yourself.

Evaluation criteria - self evaluation	**Outstanding**	**Very good**	**Average**	**Below average**
I know when the UN approved the Agenda 2030.				
I know the main purpose of the SDG's.				
I know to which 5 P's the SDG's relate.				
I know how many SDG's there are.				
I can define the SDG's in my own words.				

What did you do good? What skills or knowledge are you proud of?

What could you've done better and how?

student's manual: p. 27

How big is your consumer and carbon footprint and what can you do to improve it? Underneath there are different tests you can do on the internet.

- https://knowsdgs.jrc.ec.europa.eu/cfc
- https://footprint.wwf.org.uk/#/
- https://eplca.jrc.ec.europa.eu/ConsumerFootprint.html
- https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/
- https://footprintcalculator.henkel.com/en

Which of the tests have you done? What are the different conclusions?

Test	Conclusion

What can you tell about your carbon footprint?
Compare your results to other results from the students in the classroom who took the same test.
What advices will you pick up on?

Advices

student's manual: p. 29

Let's finish of this chapter with a creative assignment. You will work in pairs.

You will start up a campaign (poster, flyer) to make hairdressers aware of the impact of their carbon footprint and how to be as sustainable as possible. Make sure you tick of all the criteria.

Criteria	Did it or not
I have to be innovative and creative.	
I demonstrate what I've learned.	
I use colours.	
I use a slogan.	
I chose my pictures well.	
I show craftmanship and skills development.	
I think carefully about the content.	
I know my target group.	
I succeed in my goals.	
I am convincing.	

Assignment student's manual p. 29

The teacher will evaluate you.

Evaluation criteria	**Outstanding**	**Very good**	**Average**	**Below average**
You are innovative and creative.				
You demonstrate what you've learned.				
You use colours.				
You use a slogan.				
You chose your pictures well.				
You show craftmanship and skills development.				
You think carefully about the content.				
You know your target group.				
You succeed in your goals.				
You are convincing.				

Are you proud of your creative assignment?

What would you do differently next time?

2. Energy and sustainability.

The tools needed for teaching are:

- Power Point presentation.
- Activity sheets.
- Computers with Internet connection.
- Projector or digital whiteboard.

CONTENTS

1. General concept of energy.
2. Types of energy.
3. Electrical energy.
   3.1. Concept of electrical energy.
   3.2. Electricity production.
4. Energy sources.
   4.1. Types and characteristics of renewable energies.
   4.2. Types and characteristics of non-renewable energies.
   4.3. Nuclear energy.
5. Environmental impact of energy.
   5.1. Clean energy.
   5.2. Effects on the environment.
   5.3. Other forms of environmental impact.

Power Point presentation: see document Presentation ENERGY module 1

1. GENERAL CONCEPT OF ENERGY.
2. TYPES OF ENERGY.
3. ELECTRICAL ENERGY

Sessions 1 and 2.

Activity Sheet:

Activity 1:

Based on the example given in point 1 of the topic, explain the energies applied in the use of:

Instrument	Energies
Electric razor:	
Hair iron:	
Hair dye:	

Activity 2:

Search in your area of residence or business, what is the primary energy from which the electricity is obtained, where the power plant is located, and which company it belongs to.

Activity solution book:

Solution activity 1:

Instrument	Energies
Electric razor:	The electrical energy moves the motor and is transformed into mechanical energy that moves the blades, thanks to the pressure of which the hair is cut.
Hair iron:	Electrical energy is converted into heat (thermal energy) by applying a resistor in contact with a surface, which is then applied to the hair.
Hair dye:	the internal energy of the chemical compounds, once they are mixed and applied to the hair, is transformed into chemical energy that achieves the modification of the hair colour.

Other resources:

Video 1	https://www.youtube.com/watch?v=FpgqQDJ01K0 Introductory video on Europe's transition to a green energy future.
Article	https://www.conserve-energy-future.com/advantages_disadvantages_hydrogenenergy.php Article in English on the advantages and disadvantages of hydrogen as an alternative fuel.

4. ENERGY SOURCES

Sessions 3, 4 and 5.

Activity sheet:

Activity 3:

Research how fossil fuels originated and why they are important.

Share it with the rest of the class.

Activity 4:

Research the amount of electrical energy that currently comes from renewable energy sources and reflect on why humanity still relies mostly on non-renewable energy sources. Have a group discussion.

Activity solution book:

Solution activity 3:

Websites in Spanish where you can find information:

https://www.ecologiaverde.com/que-son-los-combustibles-fosiles-y-como-se-formaron-1349.html

https://es.wikipedia.org/wiki/Combustible_f%C3%B3sil

https://concepto.de/combustibles-fosiles/

https://www.nationalgeographic.es/medio-ambiente/explicacion-que-son-combustibles-fosiles

https://solar-energia.net/energias-no-renovables/combustibles-fosiles

Websites in English where you can find information:

https://ocean.si.edu/conservation/gulf-oil-spill/what-are-fossil-fuels

Other resources:

Video 2	https://www.youtube.com/watch?v=Giek094C_l4 Very entertaining and easy-to-follow video summarizing information on renewable energies.
Video 3	https://www.youtube.com/watch?v=MpEJnnpye-k Very entertaining and easy-to-follow video summarizing information on non-renewable energies.
Video 4	https://www.youtube.com/watch?v=5UxCUuk4CEs Video in English about blue energy.

5. ENVIRONMENTAL IMPACT OF MINING

Sessions 6-13

Activity sheet:

Activity 5:

Look for information and discuss as a group whether the following renewable energies are considered clean, justifying your answers:

- Hydroelectric power
- Solar energy
- Ocean energy
- Bioenergy.
- Nuclear energy.

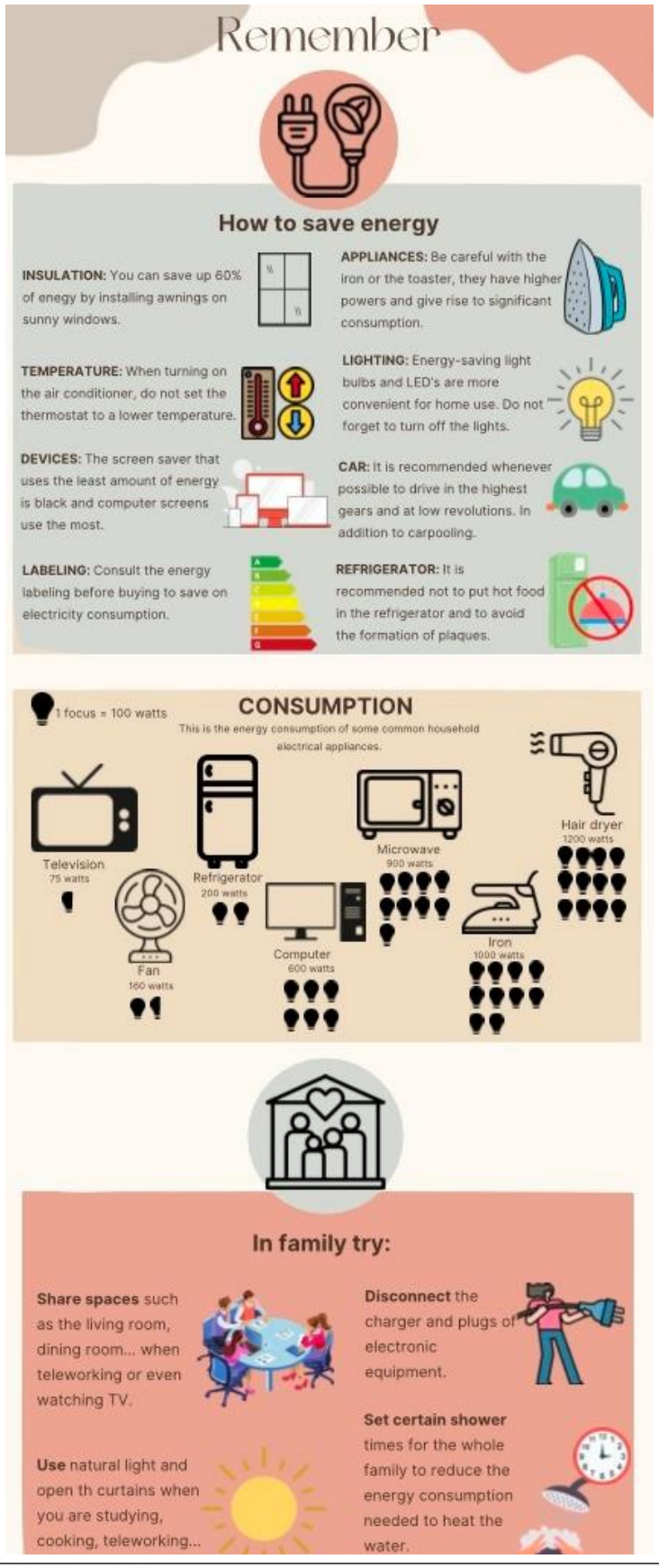
Activity 6:

Search for information on the Internet and explain the following terms:

- Greenhouse gas.
- Acid rain.
- Smog.
- Soil acidification.
- Parasites.
- Avifauna.
- Deforestation.
- Biomass
- Radioactivity.

Activity 7:

In a group, make an infographic with tips for responsible energy consumption in 3 areas of the home (use the one below as an inspiration): family, study/work, leisure



Activity 8:

Make a checklist of day-to-day actions to reduce our electricity consumption and share it with the rest of your colleagues.

Action	Frequency	Target	Achieved
E.g.: Mobile charger plugged into the grid	Permanently plugged in	Unplug it when charging is complete.	Yes

Activity solution book:

Solution activity 6:

- Greenhouse gas: a gas that absorbs and emits radiation in the infrared range. This process is the fundamental cause of the greenhouse effect, without which the average temperature of the earth's surface would be -18°C instead of the current average of 15°C.
- Acid rain: rain with dissolved acids, mainly sulphuric and nitric acid, from fossil fuels and combustion engines.
- Smog: also called photochemical smog or toxic fog, is an air pollution that occurs when fog is combined with smoke and other pollutant particles floating in the atmosphere. It can irritate the lungs causing breathing difficulties and can often be seen over cities on the horizon, appearing as a brown haze.
- Soil acidification: Soil acidification is the lowering of soil pH, which negatively affects crops, native flora and wildlife. Soil and subsoil become less fertile and less favourable for crops and soil micro-organisms.
- Parasite: an organism that feeds on substances produced by a living being of a different species, living inside or on the surface of the organism, often causing damage or disease.
- Avifauna: all the birds of a country or region.
- Deforestation: a phenomenon, caused by the impact of human activities or natural causes, resulting in the loss of forests and woodlands.
- Biomass: biomass is understood as all organic matter that can be used as a source of energy and whose origin can be either animal or vegetable and may have been obtained naturally or come from artificial transformations carried out in biomass plants. The energy it produces is called bioenergy.
- Radioactivity: is a natural physical phenomenon, by which certain substances or chemical elements, known as radioactive, emit radiation that has the property of impressing photographic plates, ionizing gases, producing fluorescence, passing through bodies that are opaque to ordinary light, etc. The danger of these forms of radiation is that they can damage DNA and cause cancer.

Solution activity 7:

Example of an infographic:

https://twitter.com/aeselsalvador/status/1242184700657127426?lang=de

Solution activity 8:

Possible actions to be considered:

Action	Frequency	Target	Achieved
Mobile charger plugged into the mains	Permanently plugged in	Unplug it when charging is complete.	Yes
Insulation of windows against heat.	Once	Installation of awnings or protective vinyls on windows where the sun shines.	
Insulation of windows against the cold.	Once	Installation of windows with Climalit type cold-proof protection®	
Correct use of the air conditioning thermostat.	Every time it is started.	Do not set the thermostat at a higher or lower temperature than desired.	
Car use	Every use.	Drive whenever possible in the higher gears and at low revs.	
Luminaire check	Once	Change household light bulbs to energy-saving and LED bulbs.	
Use of the refrigerator		Do not put hot food in and avoid the formation of plaque.	
Others…			

Other resources:

Video 5	https://www.youtube.com/watch?v=1hmQhsDbVG4 Video summarizing information on the impact of energy.
Video 6	https://www.youtube.com/watch?v=psoxx38rhL8 Video in English about dirty and clean energies explained in a very educational and approachable way.
Video 7	https://www.youtube.com/watch?v=LZXUR4z2P9w Video in English and subtitled in Spanish on why the fear of nuclear energy is further damaging the environment.
Video 8	https://www.youtube.com/watch?v=N-yALPEpV4w Video in English and subtitled in Spanish on facts and figures on why renewable energy is not the answer to climate change.

2.1 Theoretical test

It reviews and reinforces the concepts. It is recommended to do the quiz using digital tools such as google forms, Kahoot or any other application to improve students' digital competences.

Which of the following basic properties does energy NOT have?

a) Energy is transformed
b) Energy is degraded
d) Energy is destroyed
(e) Energy is transported

2. The energy generated by the movement of positive and negative electrons within conductive materials is the energy:

a) Electromagnetic
b) Electrical
c) Luminosa
(d) Nuclear

3. Energies derived from natural sources that take millions of years to form are:

a) Renewable energies
(b) Non-renewable energies

4. True or false:

a) Biomass is a type of renewable energy. True
b) Carbon is the common element of all non-renewable energies. True.
c) Renewable energies are only available to the richest countries. False.

5- Point out at least 4 types of renewable energy:

Solution: Solar, wind, hydro, ocean, bioenergy, geothermal, aerothermal, green hydrogen, blue energy, biomass.

6. True or false:

a) Nuclear power does not emit greenhouse gases into the atmosphere. True.

b) Renewable energies have no negative impact on the environment. False.

7. Here are some of the effects that energy production has on the environment. You must indicate what type of energy source has produced them:

a) Emission of greenhouse gases into the atmosphere.

Solution: Non-renewable energy

b) Impact on the landscape and local wildlife

Solution: Renewable energy

(d) Water pollution through discharges

Solution: Non-renewable energy.

3. Water

Lesson 1 'Water - a resource threatening to become scarce'

- Facts and figures
- Water - resource threatening to become scarce
- How can we save water with simple steps

Lesson 2 'Water pollution and water purification'

- Water pollution in general. Ocean clean-up project
- Waste water purification: who does it and how it happens

For the PowerPoints see document Module 1 PowerPoint - Water

3.1 Water - friend and enemy: The Netherlands as waterland & the Dutch water management (extra-curricular materials)

Nederland is a waterland. A big part of the country's territory is located under the sea level and the rest is very vulnerable to floods. That's why the Netherlands has so much expertise in flood control and clean water.

The vulnerability of the Dutch delta – the flood defence system – keeps the Dutch working on their water management daily. This means that the country's flood defence system and flood risk management is of highest priority to its government as well as citizens. Because if things go wrong, it immediately has a detrimental effect on the people and the economy. The flood risk management is not just about a high dam, a sturdy dune and a climate-proof city It also means being prepared for the unknown. The Dutch government works together with businesses and knowledge institutes in order to have a well prepared evacuation plans might the unexpected happen.

As much as 70% of the Dutch population lives below sea level!

The way Dutch people have conquered part of their territory from the ocean is so unique in the world that other countries also want to learn from them. For the Dutch, water has always been friend and foe. The Netherlands is a relatively small deltaic region in Western Europe. Three major rivers, the Rhine, the Meuse and the Scheldt, fan out across the country before flowing into the North Sea. From the early Middle Ages onwards, the Dutch reclaimed and defended land from the sea. In order to succeed skills, such as water management, spatial planning, water supply and water quality, needed to be developed. Today, the water management skills of the Dutch are well-known all over the world; water is in the genes of

the Dutch is often said. Water also shaped the landscape of the Netherlands. Windmills (once used to pump out excess water), dikes and levees form a powerful international image.

Water does not stop at borders. Moreover, the world faces major water challenges every day, whether the water is too much, too little or too polluted. These challenges require holistic and sustainable solutions. By constantly adapting their approach to water over decades, the Dutch have gained an advantage and skills which they readily share internationally.

Picture: The Dutch Delta Works – is a series of construction projects in the southwest of the Netherlands to protect a large area of land around the Rhine–Meuse–Scheldt delta from the sea. Constructed between 1954 and 1997, the works consist of dams, sluices, locks, dykes, levees, and storm surge barriers located in the provinces of South Holland and Zeeland.

[Source picture: https://600jaarelisabethsvloed.nl/event/25-jaar-maeslantkering-en-voltooiing-25-deltawerken/]

[source: https://www.netherlandsandyou.nl/your-country-and-the-netherlands/china/and-the-netherlands/water-climate-and-energy]

Search the web for information on the North Sea Flood of 1953, one of the largest water-related disasters in the history of the Netherlands. What has the country done and keep doing to prevent such an enormous flood from happening again? How did government interfere? [NL: Watersnoodramp van 1953 e.g. here

https://www.rijkswaterstaat.nl/water/waterbeheer/bescherming-tegen-het-water/watersnoodramp-1953)

Watch the TED-Ed video 'Why isn't the Netherlands underwater?' (5.30 minutes): https://www.youtube.com/watch?v=25LW_PG2ZuI and answer the question: How do Delta Works prevent the Netherlands from potential floods? What is according to the video special about the Dutch city Rotterdam?

4. Waste

Lesson 3: 'Why is waste a growing problem in nowadays' linear economy?'

- Facts and figures
- Why is waste a growing problem?
- Reduce – reuse – recycle and how to do it wisely

Lesson 4: 'Circular economy and waste as the new raw material'

- What is circular economy?
- How can waste be the new 'raw material'?
- Beat the microplastics

For PowerPoints see document: Module 1 PowerPoint - Waste

5. RAW MATERIALS

In addition to the content of the Text Book available to students, it could also be useful what is contained in the following websites and documentation:

WallStreetMojo
The World's Most Comprehensive Educational Resource for Finance, Accounting, and Investment Information
https://www.wallstreetmojo.com/raw-materials/

EIT Raw Materials (European Institute of Innovation and Technology)
Initiated and funded by the EIT (European Institute of Innovation and Technology), a body of the European Union, is the largest consortium in the raw materials sector worldwide. Its vision is to develop raw materials into a major strength for Europe. Its mission is to enable sustainable competitiveness of the European minerals, metals and materials sector along the value chain by driving innovation, education and entrepreneurship.
https://eitrawmaterials.eu/

See also the rich YouTube channel constantly updated
https://www.youtube.com/@EITRawMaterials/videos

In particular interesting the following introductory video: "Raw materials. Why do they matter?"
https://youtu.be/ADWsTD4-WAw

Water Footprint calculator
https://www.watercalculator.org/

Plant-based raw materials
See the PDF downloadable from the site
https://www.researchgate.net/publication/315955240_Plants_as_raw_materials

Animal-based raw materials
Animalsmart.com – Feeding the world
https://animalsmart.org/feeding-the-world/products-from-animals

Mineral-based raw materials
Start from this interesting video-lesson
https://www.youtube.com/watch?v=wQhFQFeYdJU

Water – uses and abuses
European Environmental Agency
https://www.eea.europa.eu/signals/signals-2018-content-list/articles/water-use-in-europe-2014#:~:text=On%20average%2C%20144%20litres%20of,differs%20from%20region%20to%20region.

Thinking activation (in addition to those already proposed in teacher's book)

About RAW MATERIAL

- How can we promote sustainable consumption and production patterns?
- How can we reduce waste and conserve resources in our daily lives?
- How can technology and innovation help us to find alternative and sustainable sources of raw materials?
- How can circular economy models be applied to reduce the negative impact of resource extraction?
- What are some challenges and opportunities associated with transitioning towards a more sustainable use of raw materials?
- How can we balance economic development and environmental sustainability while using raw materials efficiently?
- What are some successful examples of sustainable resource management practices that can be replicated globally?

About WATER

- In what ways can individuals reduce their daily water usage to help protect this essential resource?
- What changes can cities and communities make to reduce their overall water consumption and mitigate environmental damage?
- Why is it important to invest in sustainable infrastructure, such as rainwater harvesting and greywater recycling, to ensure a reliable future water supply?
- How do agricultural practices and irrigation methods impact local water resources and ecosystems?
- What role does education play in promoting responsible water use and conservation behaviors?
- How might advances in technology, like smart irrigation systems and real-time water monitoring, improve our ability to manage and sustainably utilize water resources?
- How can policymakers balance competing demands for water use, such as agriculture, industry, and human consumption.

6. MANAGEMENT

Video introduction to what business and management are (from **Young Entrepreneurs Forum**)
https://www.youtube.com/watch?v=6mkoGSqTqFI

There's a lot of interesting videos about the topic on the **Young Entrepreneurs Forum** Youtube channel.
https://www.youtube.com/@Youngentrepreneursforum

In addition to **Activity 1** e **2** presented in Textbook you may use the following as well:

Activity 3 - Assigning students to analyze and evaluate real-life case studies of management practices can provide a hands-on approach to learning about management techniques. Students can be asked to identify key management strategies used in the case, potential problem areas, and suggest solutions for improvement.

Activity 4 - Role-playing exercises: Students can be given a scenario that requires them to take on the role of a manager and practice making decisions and problem-solving. This could involve working with a team or managing an individual, allowing students to experience firsthand the challenges and benefits of different management styles.

Activity 5 - Research paper: Assigning students to write a research paper on various management theories and methodologies can help them develop a robust understanding of the subject. They can explore the origins of management principles, their evolution over time, and the various applications of management theories in different industries and markets. This type of assignment encourages critical thinking and develops skills in research and analysis.

And, more, some other ideas to work on:

1. Write down five reasons why you should start your new business now; then write down five reasons why it is a bad time. Do the positives outweigh the negatives?

2. Analyse your business idea in terms of the features, advantages and benefits of the new product or service. How will it make life better for those who buy it?

3. Which of your personal goals will you satisfy by starting business? For example what is the relative importance of goals such as financial goals, desire for freedom, recognition, and realisation of potential technology, to you?

4. What are your present strengths and weaknesses in terms of experience, expertise, contacts, resources that will help you to launch your business?

5. Brainstorm: Write down ten ideas for a new business, no matter how crazy or impractical. Develop criteria for selection, such as benefits for the user, practicality, existing competition and fun to do. Score your ideas against your criteria. Select the best and develop five reasons why this is a killer idea, and why it would delight the customer.

6. Chose a ground-breaking product with which you have some familiarity, for example development of the ARM processor, or the introduction of the Apple iPOD, or the development of a drug. Write a short outline business plan that the pioneers might have written at the start of the project, but disguise the name. Swap with a colleague and critique each other's plan. Would you have funded their plan, without the benefit of hindsight?

7. Find, on the web, the last published accounts for a large company like Apple or IBM. Calculate the ratios given in the lecture. Discuss your conclusions

8. Classic team demo. Line the in groups of ten or so in a double line facing each other, with your right arms and index fingers stretched out. Lay a garden cane across the outstretched fingers. Tell the group that the task is to stay in contact with the cane, but lower it to the ground. The cane moves up, not down, as each person locally optimises their contact with the cane. It takes communication for each to move downwards.

9. Middle management muddle Divide the class into three. One part is the workers, the second are their managers and the last the senior managers. The senior managers can only communicate with the workers, and the workers can only communicate with their manager. All communications must be in writing. Give the workers some materials for a task – sorting cards, for example. Give the senior managers the goal – sort the cards into ascending order. Half way through change the task – sort into descending order instead. Introduce some snags, for example some cards might be blank, Watch the chaos ensue.

10. Draw up a proposed organisation chart for your new business.

11. Try taking the "25 words, five messages and a question" test: Often you have to pitch your idea in as little as 30 seconds. If you can summarise your pitch in 25 words or less, we will be able to sell it more effectively. Next, list the five most compelling messages that your full pitch will contain; bullet-points will do. Finally, imagine that you are about to make a presentation to a large auditorium full of potential investors or customers. What one question would you ask them to engage their minds, and make them realise that this was something both relevant to, and compelling for both them and their businesses?

12. Analyse half a dozen adverts, preferably for fashion goods or cosmetics. What are the real messages about the benefits of their products that the advertisers are trying to convey? Look at such things as the implied lifestyle and surroundings of the people in the advert. How do these messages differ from the surface message about the product features?

If you want to deep the topic of using a CRM for business management, you can find some good idea here:

HOW TO USE EXCEL TO CREATE A CRM
TUTORIAL:
https://youtu.be/KMN0nELzcas
https://youtu.be/I-Ze6bX7ous
Excel is one of the most powerful pieces of software that businesses can use. Excel is not specifically a piece of contact management software, nor is it accounting software. It's not even calendar software; in fact it's all of those things and anything else you want it to be. The power of Excel lies in its flexibility. A spreadsheet is essentially a basic programming environment that allows you to store and organize data, and then manipulate that data in a number of straightforward ways. Once you learn the basics, you can create some impressively dynamic and useful spreadsheets that will manage a number of

aspects of your business. And because you'll be using software that you likely already own, you'll save a lot of money and face fewer compatibility issues. Here we will look at how you can turn Excel into a powerful CRM system with minimal effort and maximum efficiency.

USING EXCEL: THE BASICS

Before using the dynamic elements of Excel, users start with a table that they can fill out as they wish. This simple setup is useful, as it will allow you to list all of your contacts' names down one column, with contact details, notes and history in other columns. For sales teams, notes might include things like personal details or comments for future discussions, while for marketing teams one might include how many purchases a customer has made, along with details regarding a customer's interests or tendencies. What you have now is the very basics of a CRM system.

ORGANIZING CONTACTS WITH FILTERS

Still keeping track of clients manually? That's where one of the more dynamic features of Excel comes in: filter. To filter your entries on the newest version of Excel, click the "Home" tab and then the "Sort and Filter" option. Make sure you've highlighted the top row for the columns that you want to apply the change to, and then click "Filter."

CONDITIONAL FORMATTING

Another nifty Excel feature is the ability to use conditional formatting. This function is available from the "Home" tab, and it lets users define colors and other formatting changes for specific cells. For instance, if you were to update your contact list each time you spoke to a customer, you could set up your spreadsheet to highlight the contacts who haven't heard from you in a while. That way, you can easily see which contacts haven't been contacted recently (and therefore know automatically which may require a follow-up).

FORMULAS

Of course, one could also use formulas to achieve the above effect. Formulas allow people to automatically calculate user-defined inquiries. These formulas can be used to calculate the difference between two dates, convert measurements, compare cell contents and look up values in a range. Each formula starts with an "=" sign followed by a space, and then contains the formula specifics. For instructions on how to use conditional statements (ie. "if" statements), check out YouTube for a number of instructional videos like the one below. Once you feel confident about your Excel abilities, you can try being more adventurous with things like a Nested IF.

VLOOKUP

VLOOKUP is one of Excel's most powerful functions, allowing you to look up information from other worksheets. This function allows you to keep a key of information that you can easily use to find additional relevant information about your contacts.

CAN YOU *REALLY* USE EXCEL FOR CRM?

By using these tools, you can have a dynamic list of contacts that you can search through using smart parameters, that you can use to display graphs. These parameters will alert you to important user-defined scenarios and triggers, and if you're skilled with Excel you can add more functions as you need them.

Lesson 1

Why is waste a growing problem in nowadays 'linear economy'

Sustainable Salon

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Student registration

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Objectives of the lesson

- For students to understand the concept of recycling and the threat of waste
- For students to have knowledge on the benefits of reusing and recycling
- For students to have knowledge of waste management

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Group activity

- Make a group from 3 or 4 students
- Find facts and figures on the internet about waste and how to reduce
- Write down your findings
- Share your thoughts with the group

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Why waste is a growing problem?

- Global waste is expected to grow to 3.40 billion tonnes by 2050, more than double population growth over the same period.
- There is a positive correlation between waste generation and income level. Daily per capital waste generation in high-income countries is projected to increase by 19 percent by 2050, compared to low- and middle-income countries where it is expected to increase by approximately 40% or more.
- Taking into account the predicted world population growth in the coming years, the solid waste generation is possible to become an even bigger and more alarming problem.

Video about reduce – reuse - recycle

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Aftertalk video

- What is your first thought of this video?
- Do you think we can recycle more?
- What can we recyle?

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Student activity: microplastics

- Make pairs
- Download the app through scanning the QR-code
- Check all the products you have with you through this app
- Did you find any products with microplastics?

Evalation

1. Any questions so far?
2. What are we going to do next week

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Lesson 2

Circular economy and waste as the new raw material

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Student registration

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Objectives of the lesson

- Getting acquainted with concept of circular economy
- Getting acquainted with waste as a new raw material
- Experiment with recycling paper

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Circular economy

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Waste as a new raw material

- In a circular economy, waste is the new raw material. There is no longer the line (as in the linear economy): produce, consume and then throw it away. This saves raw materials, the environment and reduces CO2 emissions. It stimulates innovation, new business activity and employment.
- In a circular economy, nearly all products used by people will be reused again and again. If a product is broken, it will be repaired. And if that is no longer possible, new products are made from it.
- In a circular economy, manufacturers design products to be reusable. For example, electrical devices are designed in such a way that they are easier to repair. Products and raw materials are also reused as much as possible. For example, by recycling plastic into pellets for making new plastic products.

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Experiment: paper recyling

- Check the following video for inspiration:

https://youtube.com/shorts/8LsVgiIupII?feature=share

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Experiment: paper recyling

1. Grab the paper/carton and make it into tiny pieces
2. Throw it in the blender mixed with a bit of water to make a pulp
3. Make a frame out of icecream sticks, glue and thin fabric
4. Throw the pulp in a bucket of water and mixed it
5. Use the frame to get the pulp onto the thin fabric (a thin layer)
6. Drip the water out
7. Let the recyled paper dry
8. Use the paper to make notes and to try it out once it is dry

Evalution

- Any questions?
- What did we learned so far?
- What did you think of this experiment?

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Lesson 1

Water: a resource threatening to become scarce'

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Objectives of the lesson

- for students to be able to look at the resource water and to get familiar with the problems around the threat that water becomes scarce
- For students to know facts and figures about the threat of water becoming scarce
- For students to have knowledge on how we can save water with simple steps, water pollution (Ocean clean-up project) and purification

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Theme introduction

- Water: a resource threatening to become scarce.
  - Fact: Can you imagine that a household uses around 130 litres of perfectly clean drinking water to do the dishes, operate a washing machine or flush the toilet?
- Main question: what do you think is the cause of the threat?
- Share your thoughts with the group

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Facts and figures

- over the past 40 years, the world’s population has doubled and use of water has quadrupled.
- Today, about 4 billion people, representing nearly two-thirds of the world population, experience severe water scarcity during at least one month of the year.
- Up to 40% of the world's population will be living in seriously water-stressed areas by 2035.
- If we continue doing what we are doing today, by 2040, there will not be enough water to quench the thirst of the world population and keep the current energy and power solutions going.
- By 2050, the world population will have grown to 9.7 billion people. Water demand is projected to grow by 55 percent, including a 400-percent rise in manufacturing water demand.

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Saving water and why?

The main reasons for the growth of water scarcity on the planet:

- the growing water demand due to the population growth,
- higher living standards with increasing water demand,
- the dietary consumption of more animal products,
- expansion of irrigation in the agriculture.

Moreover, deforestation, the climate change (combination of floods and droughts), water pollution and wasteful water use (like flushing the toilet or operating a washing machine with clean fresh water) can result in the shortage of water supply.

For example in the Netherlands, the famous ‘water country’, in the last couple of years there’s been an impending water shortage, especially due to hot summers.

Tips to save water

1. Use a bowl in the sink when washing fruit, vegetables of dishes. You can then use the waste water to water your plants.
2. Fill a jug of water and put it in the fridge for when you want a cool drink.
3. Turn off the tap when you clean your teeth. A running tap uses up to nine litres of water a minute.
4. Wait until you have a full load before using your washing machine or your dishwasher. Some new washing machines use less than seven litres of water for each kilogramme of clothes, while modern dishwashers can us as little as 10 to 15 litres of water a cycle.
5. If possible, take a shower instead of a bath. A five-minute shower uses about 40 litres of water. This is about half the volume of a standard bath.
6. Use a water-saving device in your toilet cistern. Depending on the size of your cistern, you could save between one and three litres each time you flush the toilet.
7. Using a watering can in the garden instead of a sprinkler or a hosepipe. Garden sprinklers and hosepipes left running can use between 500 and 1000 litres of water an hour.
8. Think about fitting a water butt to collect rainwater off your roof. Water butts usually store about 200 litres of water. As well as being better for watering your plants, using rainwater in the garden reduces the amount of treated water you use.
9. Check your property regularly for leaks on your internal plumbing.
10. Try shortening your regular shower routine with 2 minutes (make it for example 5 instead of 7 minutes). Also making your water temperature 1-2 degrees lower will help you save some energy and is good for your health (if you have heard about the Ice Man Wim Hof, then you know that. Otherwise look up the Wim Hof method online!)

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Water pollution

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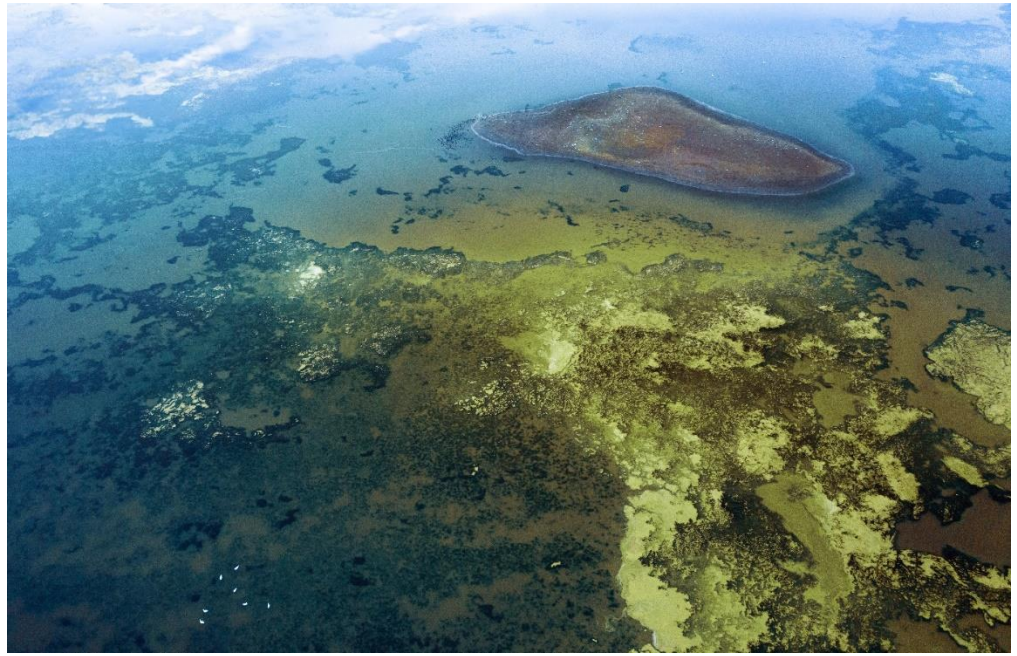
Causes of water pollution

1. Agriculture
2. Sewage and wastewater
3. Oil pollution
4. Radioactive substances



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Student activity

1. Answer the following questions and write down your findings
2. What do you see as one of the major risk for water pollution in your region?
3. And in hairdressing?
4. Which of the 4 causes presented earlier belongs this risk to?

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Evalation and self-study

1. Any questions so far?
2. What are we going to do next week?
3. Self-study: read the paper about water purfication by the award-winning company Hydraloop

HYDRALOOP

USE WATER TWICE

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Lesson 2

Water pollution and water purification

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Student registration

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Objectives of the lesson

- For students to understand the concept purification
- For students to experiment with filtering water

Exeriment explaintion

1. You will get from me a filter + waste water
2. The waste water contains: sand, gravel or hair coloring
3. Filter the water 3 times and see the results
4. Write down the findings of the experiment

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Experiment aftertalk

- What was the main goal of this experiment?
- What did we learn?
- Do you think they use this system as well for the main industry?

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Evalution

- Any questions?
- What are we going to do next week?

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ENERGY AND SUSTAINABILITY

Module 1

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Energy, general concept.

Energy is the ability of matter to do work because of its constitution (internal energy), its position (potential energy), its temperature (thermal energy) or its motion (kinetic or mechanical energy), etc.

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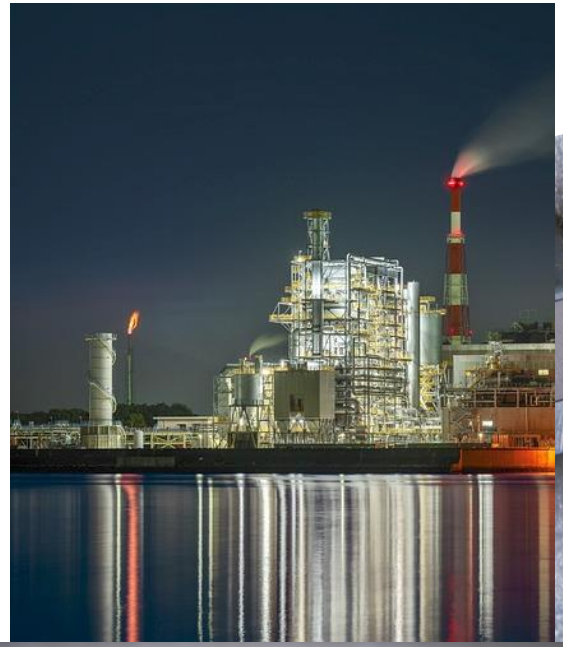
Basic propierties of energy

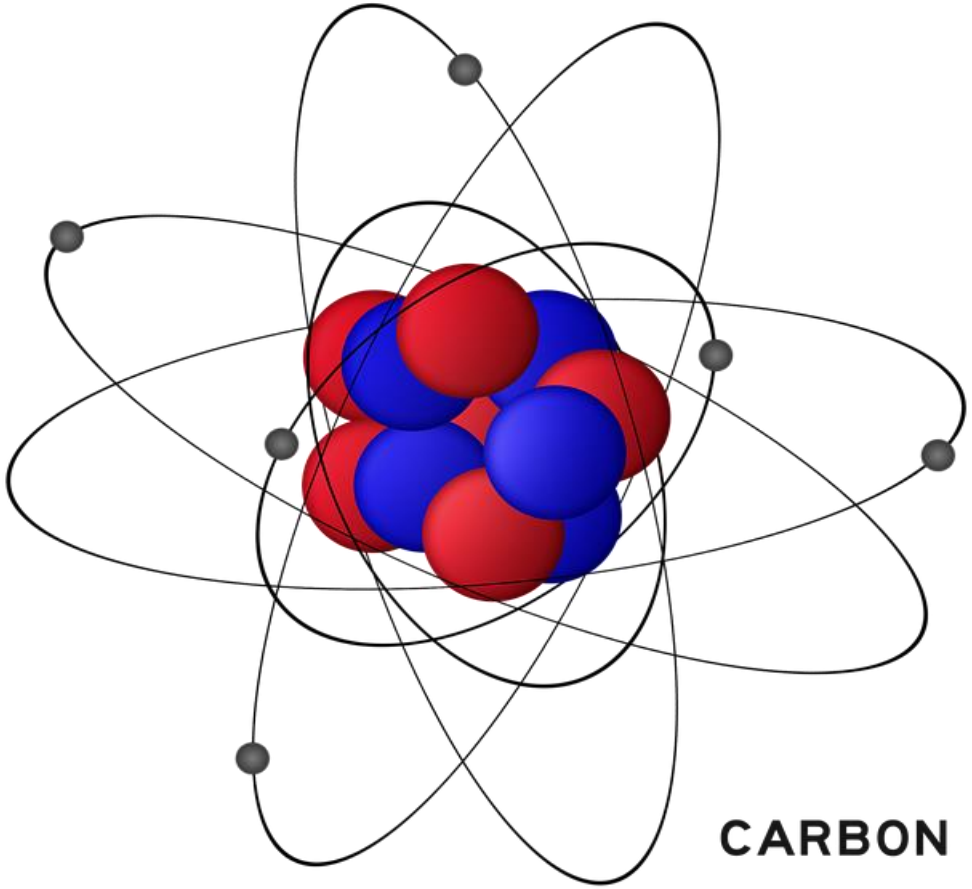
- It transforms.
- It is conserved.
- It is transferred or transported.
- It degrades.

energy is neither created nor destroyed, it is only transformed into another type of energy.

Types of energy.



Electrical energy.



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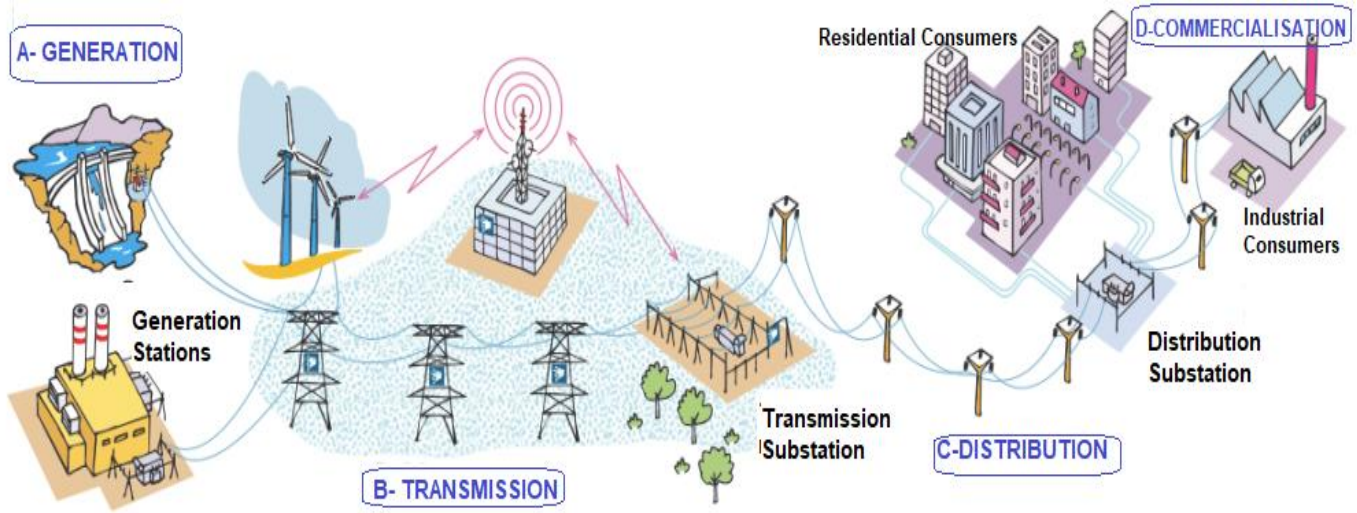
Electricity production

- Power generation.
- Power transmission.
- Energy distribution.
- Energy commercialization.



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Energy sources.

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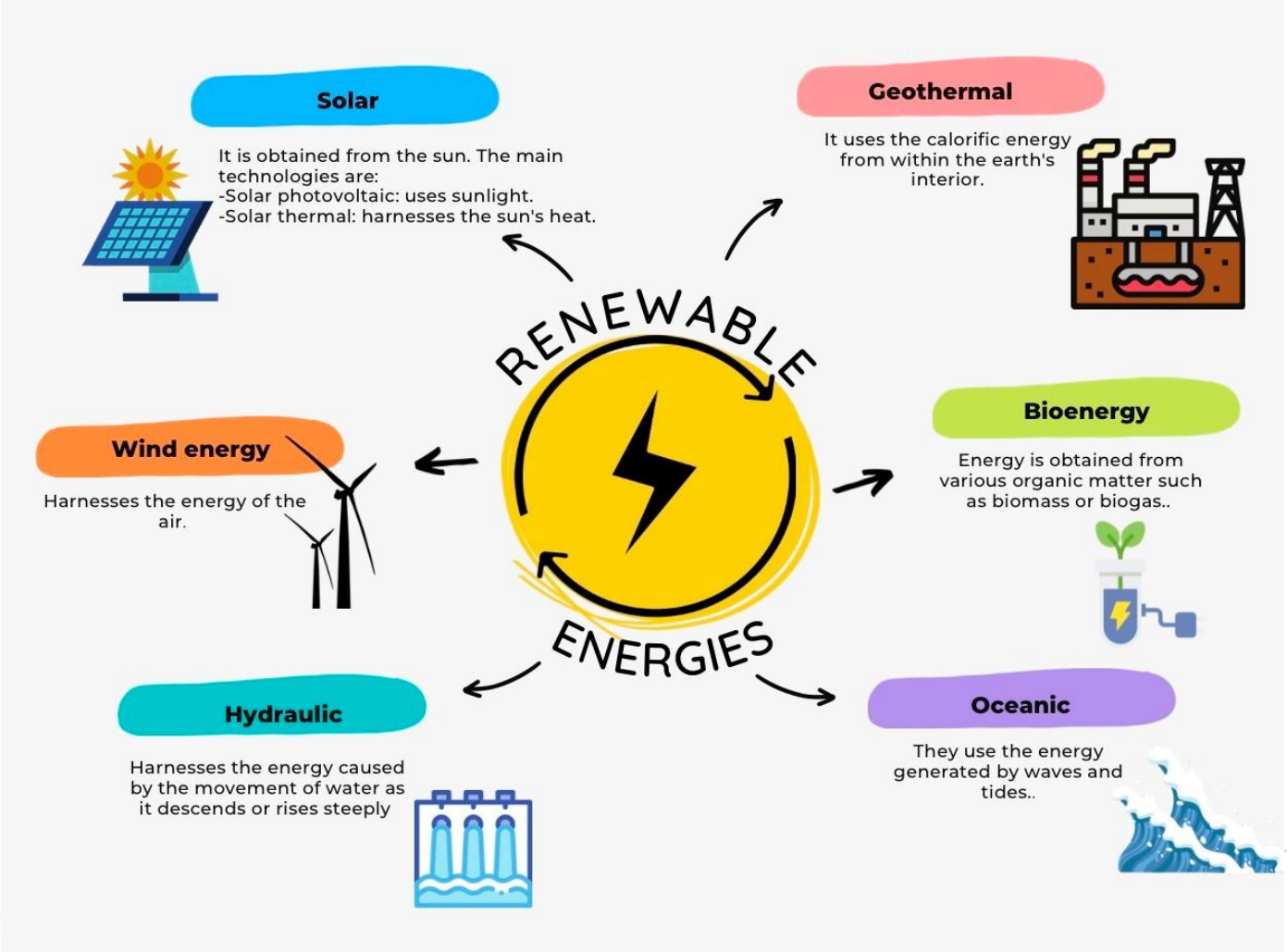
Energy sources:

- Renewable



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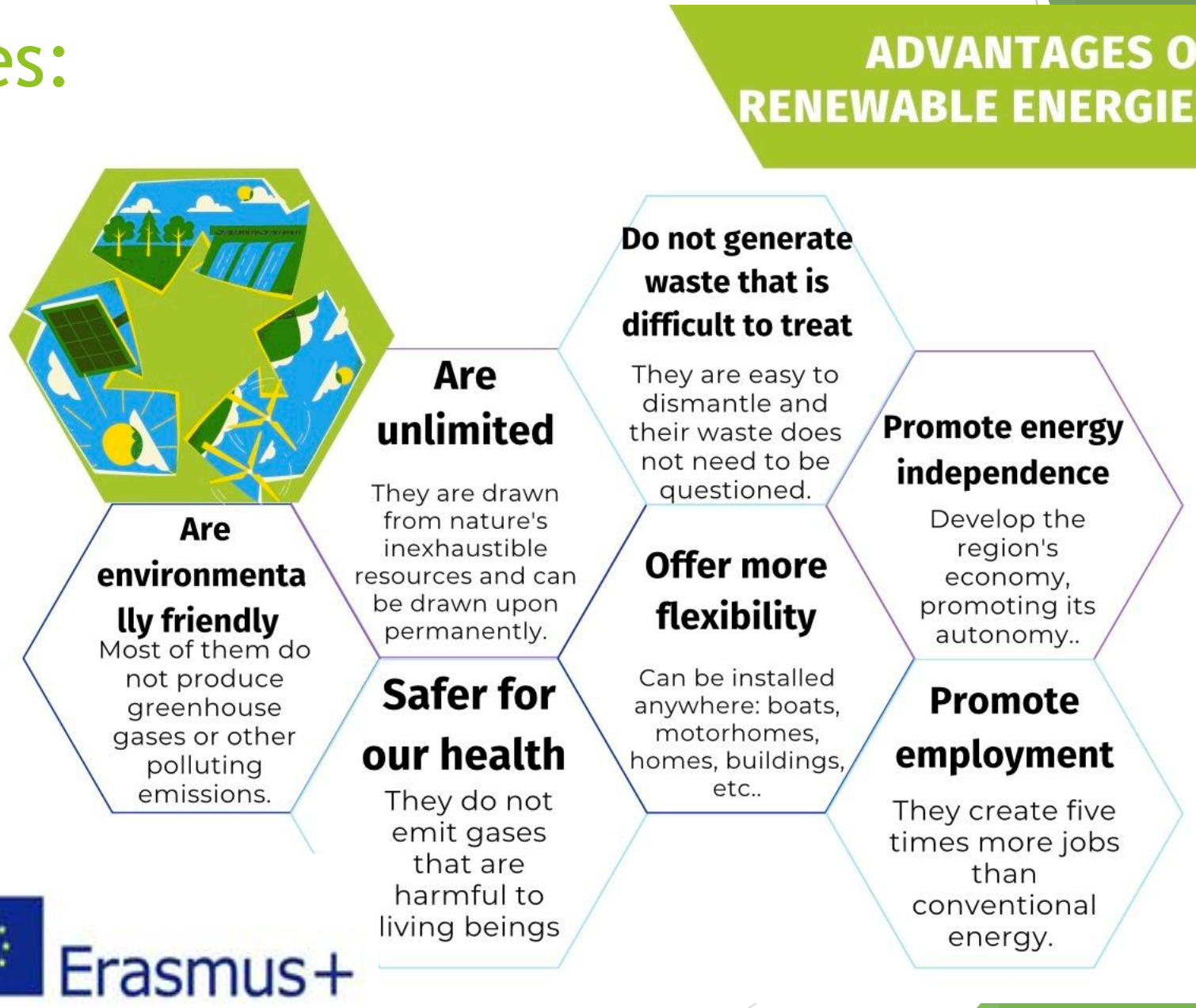
Energy sources:

- Renewable



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Energy sources:

- NON-renewables

COAL

OIL

NATURAL GAS

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Nuclear energy

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Environmental impact of energy.

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Clean energy

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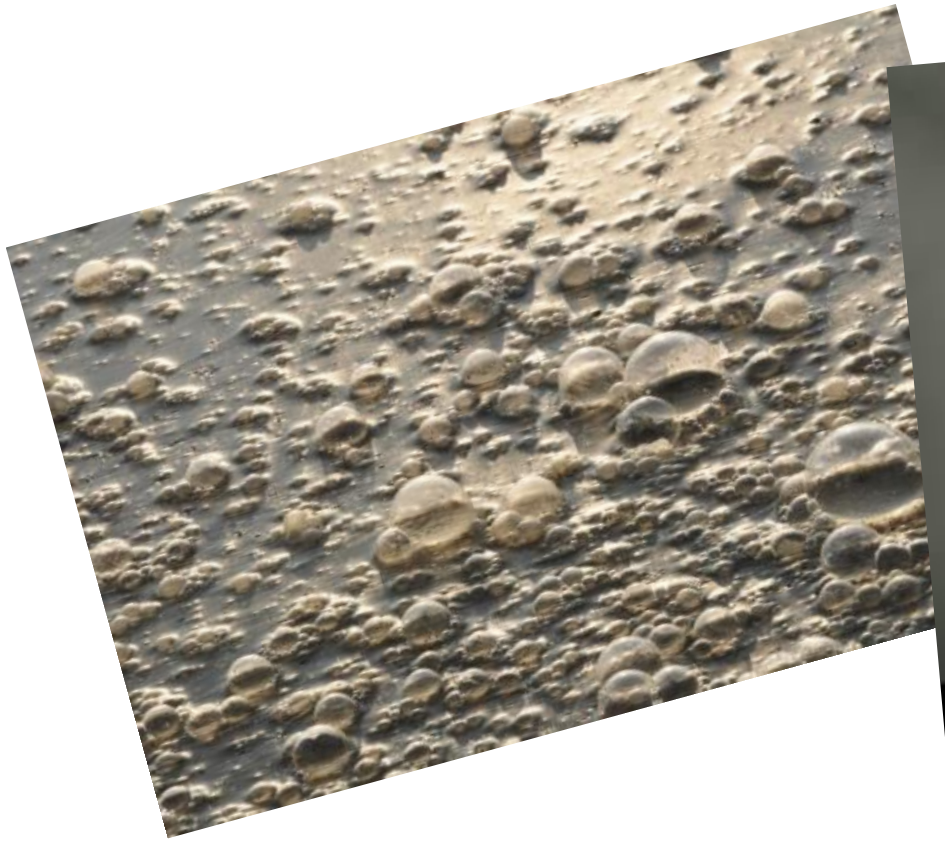
Effects on the environment



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Continue learning with

Level 2 didactic unit:

"Energy in the Hairdressing Salon I".

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1. Sustainability

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1.1. The concept: What does “sustainability” mean?

What does the word “sustainability” mean to you?

- Write some words or short sentences on the post-its and put them on the white board.
- Now read the text in your manual. Did you forget any particular and important words? Write them on the post-its and complete the brainstorm.
- Put the words on your assignment paper.

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1.1. The concept: What does “sustainability” mean?

Can you define the meaning of sustainability?

- After the brainstorm and reading the text, you should be able to write down your own definition for the word “sustainability”.

- Write your definition on your assignment paper.

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1.1. The concept: What does “sustainability” mean? – resume of the text in the student’s manual

- the ability to maintain or support a process
- to prevent the depletion of natural or physical resources
- conserving the natural resources
- greater emphasis on the life support systems
- meeting the needs of the present without compromising the ability of future generations to meet their own needs
- a commitment to zero-waste packaging
- to reduce overall emissions
- continuous re-evaluation
- using renewable energy or reducing waste
- ways to reduce their impacts upon the planet and their community

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1.2. When are you sustainable? – resume of the text in the student's manual

- a lifestyle and philosophy
- choices and behaviours that focus on living within our means to encourage human and environmental health
- prioritize the use of renewable resources
- greenwash products and the eco-market
- traditional ecological knowledge
- can be expensive
- individual choices don't make the difference, but they do make a difference
- chose to buy products from your local farmer
- to eat a more plant-based diet
- a widespread lack of accountability among governments and top polluters
- no zero-sum game in environmental activism
- consumption is all-encompassing, we consume food, energy, water, and material things like clothing
- reducing our waste
- repurpose items before throwing them in the trash
- fair trade certifications

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1.2. When are you sustainable?

What can you do to become more sustainable at home?

- Make a list of actions you can use to become more sustainable at home.
- You can use the text in your manual, internet sources or your own ideas.
- Fill in your actions on your assignment paper.

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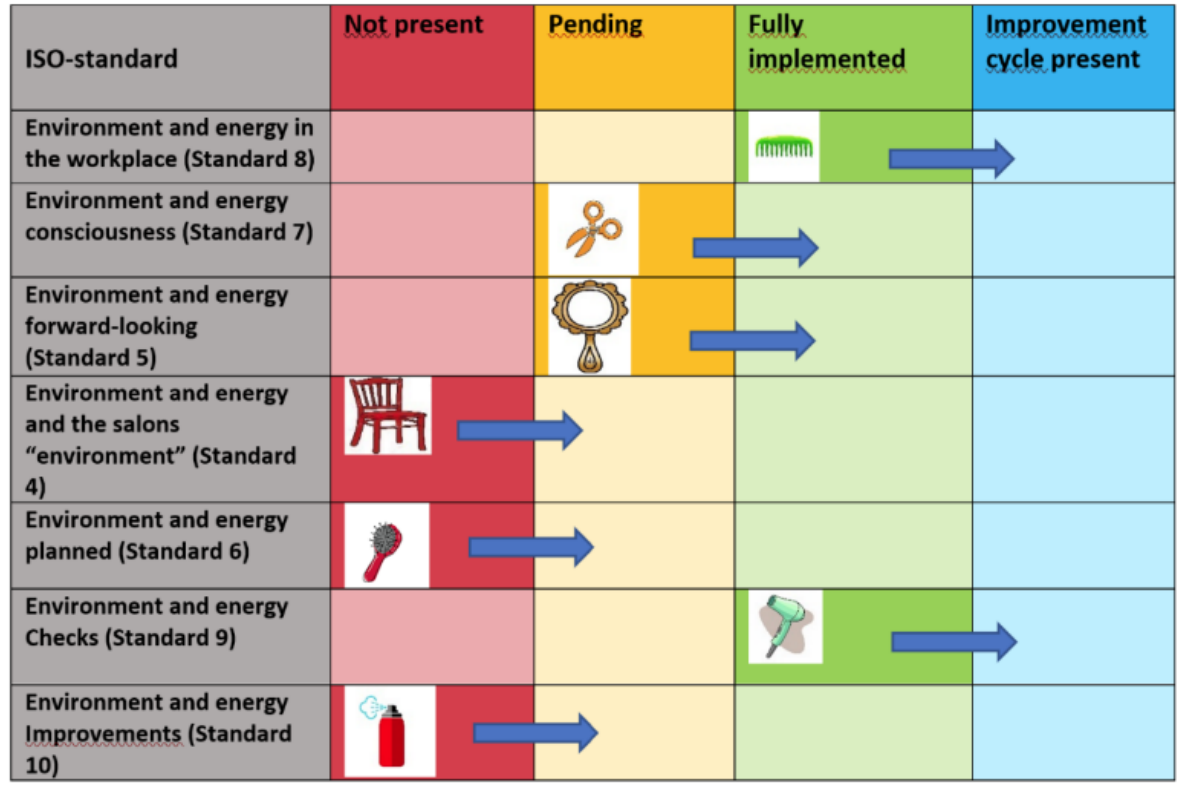
1.2. When are you sustainable?

What is a sustainable salon?

- Work in pairs.
- Find a salon that is working sustainably in your opinion.
- Prepare 10 questions you are going to ask the hairdresser(s) in the salon. Make sure you focus on sustainability.
- Make a physical appointment or schedule an online conversation with camera.
- Note the answers you get during the interview on your assignment paper.
- Ask for illustrative material to include in your presentation.
- Prepare a presentation about the sustainability of the salon.
- Present your presentation to the class group

1.3. Scans on sustainability – resume of the text in the student's manual

- https://www.sustainable-salon.info/kopie-van-output-2-sustainability-syste
- environmental care system



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1.3. Scans on sustainability

Self-assessment tools on sustainability:

- Divide in 3 groups to take the scans and process the results.
- First group: You will take the **awareness scan** from **5 different teachers at 3 different hairdressing schools**. You keep a good record of the results of the scans to create a clear overview in charts later.
- Second group: You will take the **awareness scan** in **15 different salons**, preferably across the country. You keep a good record of the results of the scans to create a clear overview in charts later.
- First group + second group: You will take **the extended** scan in **5 different salons**, **depending on the need and the results of the awareness scan**.
- Third group: You will take **the scan on organization context** of a sustainable salon from **5 recently opened businesses** (up to 1 year) and **5 salons that are already open for more than 1 year**, but less than 5 years and **5 salons that are open for more than 5 years.**

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1.3. Scans on sustainability – extra information on the PDCA-circle

https://www.youtube.com/watch?v=dgazCOz_IIY

https://blog.ticktick.com/2021/01/28/pdca-cycle-explained/

https://en.wikipedia.org/wiki/PDCA

https://www.youtube.com/watch?v=RrWW4wDYf2k

https://www.youtube.com/watch?v=e4gOPeHSRo8

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1.3. Scans on sustainability

Self-assessment tools on sustainability + PDCA-principles:

- We divide into two groups.
- Group 1: Make up a short term plan to achieve the goals set in the discussion from the previous assignment on the scans.
- Group 2: Make up a long term plan to achieve the goals set in the discussion from the previous assignment on the scans.
- Use the template on the assignment paper, including the PDCA-principles

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TEST: Sustainability

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2. Climate change

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2. Climate change

Global warming:

- Take a good look at the picture on global warming.
- Give a concrete example for the given changes.
- Use the grid on your assignment paper.

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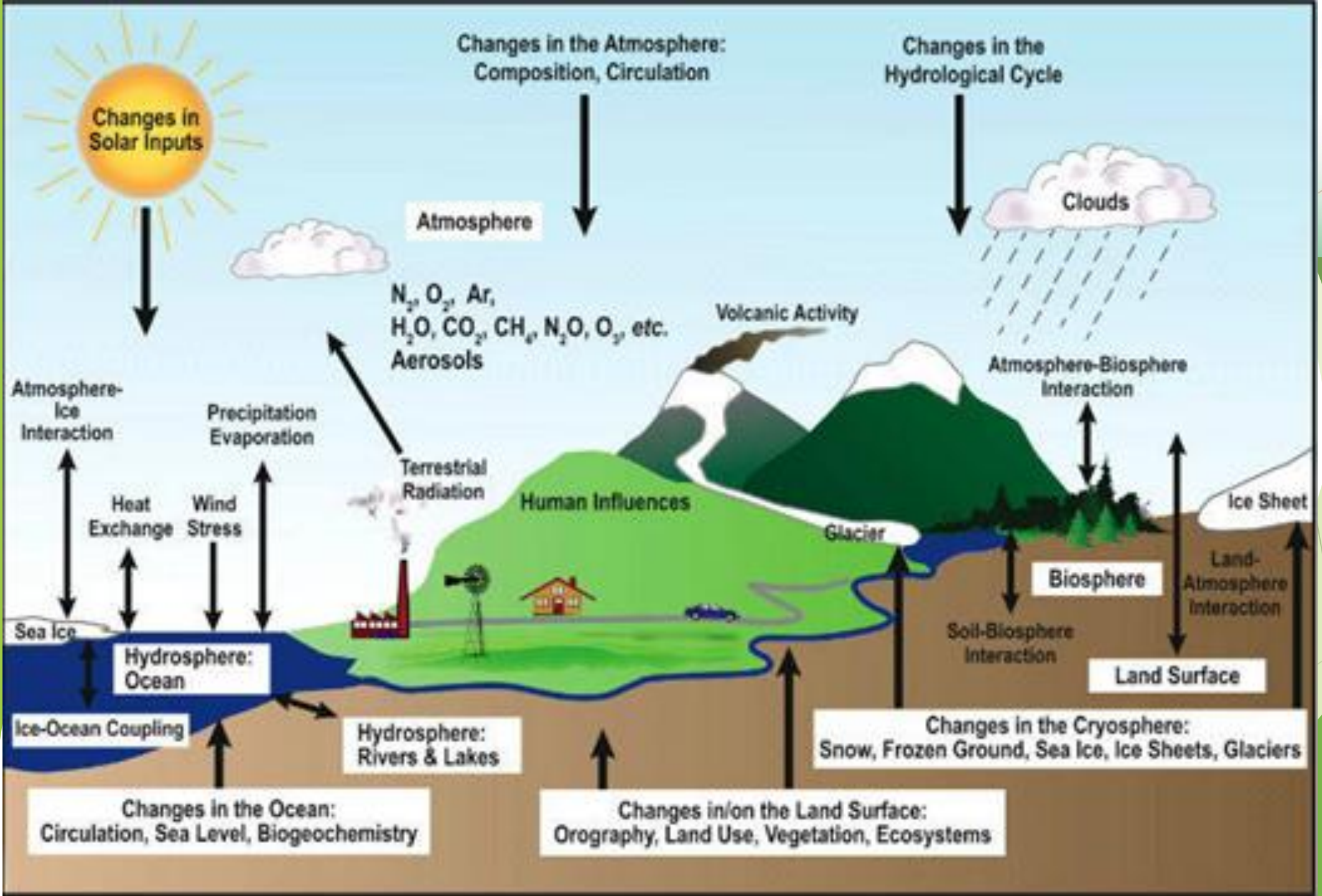

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2.1. Definition: what is climate change? How does it happen? – resume of the text in the student's manual

- long-term shifts in temperatures and weather patterns
- human activities have been the main driver of climate change
- burning fossil fuels like coal, oil and gas
- energy, industry, transport, buildings, agriculture and land use are among the main emitters
- intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity
- can affect our health, ability to grow food, housing, safety and work
- climate refugees
- a 2.8°C temperature rise by the end of the century
- cutting emissions, adapting to climate impacts and financing required adjustments

2.2. Unhealthy planet – resume of the text in the student's manual

- disease and early death are often due to environmental agents called pathogens
- shortages of safe water
- rising temperatures
- changes in agricultural practices and clearing land for farming
- a huge explosion occurred in population growth
- industrial pollution
- resource depletion
- acid rain
- ozone depletion
- air pollution
- global warming
- hazardous waste
- ocean pollution
- water pollution
- loss of biodiversity
- land degradation

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2.2. Unhealthy planet

Unhealthy planet – unhealthy people:

- Read the article online or ask your teacher the text on paper.

- Answer the questions on your assignment paper.

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2.3. Climate conferences and sustainable development goals – resume of the text in the student's manual

- yearly conferences to assess progress in dealing with climate change
- to negotiate the Kyoto Protocol to establish legally binding obligations for developed countries to reduce their greenhouse gas emissions
- first UN Climate Change Conference was held in 1995 in Berlin
- 1997: Kyoto – Japan – Kyoto Protocol
- 2000: The Hague – Netherlands – very difficult meeting that lead to nothing new
- 2001: Bonn – Germany – flexible mechanisms, carbon sinks, compliance, financing
- 2010: Cancún – Mexico – Green Climate Fund, Climate Technology Centre
- 2015: Paris – France – The Paris Agreement = climate change reduction measures from 2020
- 2022: Sharm El Sheikh – Egypt - countries delivering a package of decisions that reaffirmed their commitment, specific fund for loss and damage

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2.3. Climate conferences and sustainable development goals

Climate conferences:

- Go to the following website: https://www.un.org/en/climatechange/paris-agreement.
- Give the 3 key elements of The Paris Agreement.
- Write them on your assignment paper.

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2.3. Climate conferences and sustainable development goals – resume of the text in the student's manual

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2.3. Climate conferences and sustainable development goals

Sustainable development goals:

- Watch the video on Youtube: https://www.youtube.com/watch?v=b6qPnu82OVU

- Answer the questions on your assignment paper.

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TEST: Climate change

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3. Carbon footprint

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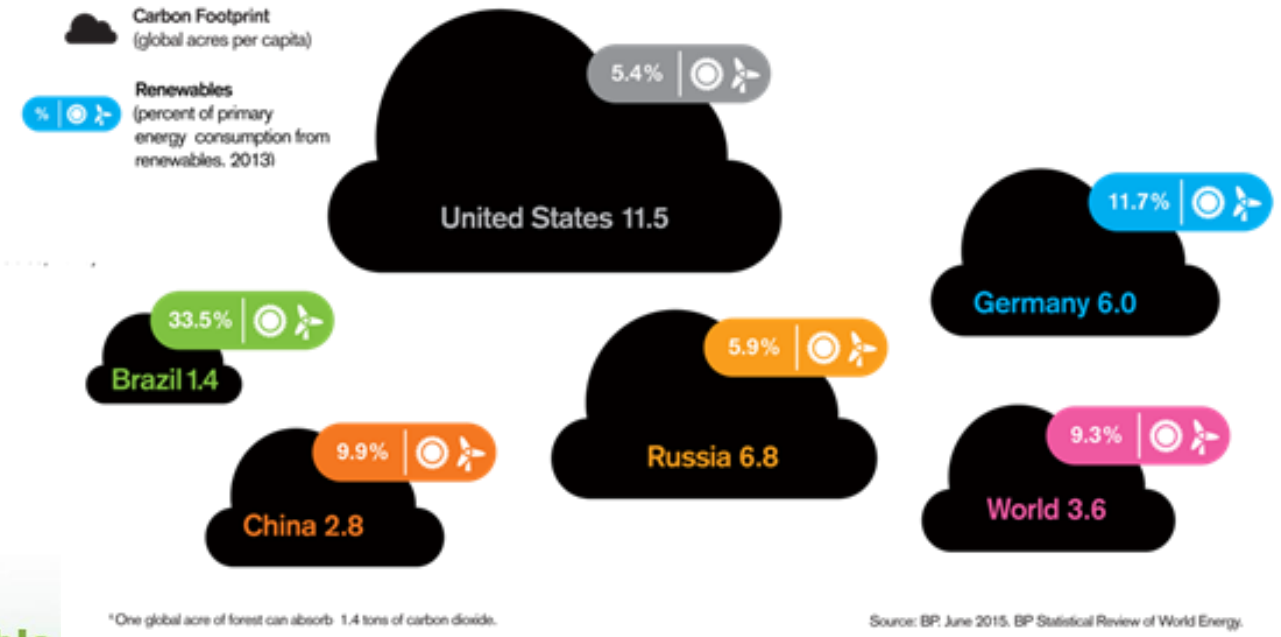
3.1. Definition: what is carbon footprint? – resume of the text in the student's manual

- the amount of carbon dioxide released into the air because of your own energy needs
- the amount of carbon (usually in tonnes) being emitted by an activity or organization
- the amount of productive land area required to sequester those carbon dioxide emissions
- Paris Climate Agreement



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3.2. The Consumer Footprint Calculator (general) – resume of the text in the student's manual

- to understand the impact of a person's behavior on global warming
- how you commute to work, what your usual diet is, how much you drive or fly, the size of your household, or what type of electricity the grid provides you
- carbon footprint calculators use standard values that aren't always right for a multiple of possible situations
- to calculate the environmental impacts of your consumption pattern, as well as to evaluate how changes in your lifestyle may affect your personal footprint
- five areas of consumption, namely food, mobility, housing, household appliances, and household goods

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3.2. The Consumer Footprint Calculator

The Consumer/Carbon Footprint Calculator:

- How big is your consumer and carbon footprint and what can you do to improve it?
- Underneath there are different tests you can do on the internet.

https://knowsdgs.jrc.ec.europa.eu/cfc
https://footprint.wwf.org.uk/#/
https://eplca.jrc.ec.europa.eu/ConsumerFootprint.html
https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/
https://footprintcalculator.henkel.com/en

- Write down your results and measures of improvement on your assignment paper.

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3.3. How to reduce your personal carbon footprint? – resume of the text in the student's manual

- transportation
- food
- water use
- energy use
- waste management

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3.3. How do you reduce your personal carbon footprint

Reducing your personal carbon footprint:

- Work in pairs.
- Start up a campaign (poster, flyer) to make hairdressers aware of the impact of their carbon footprint and how to be as sustainable as possible.
- Make sure you tick of all the criteria given on the assignment paper.

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TEST: Carbon footprint

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