Darkroom printing

Pictionary_tutorial

In this tutorial you'll learn the basics of printing in a darkroom, its basic terms and processes, and the workings of the the equipment you'll be using.

Developing a picture in a darkroom for the first time is a timeless experience that everyone should experience at least once in their life. The feeling that you get when you first see an image appear on a once blank sheet of paper is almost magical. After this you'll probably instantly forgot about the horrid smell of the chemicals and just watched as my photograph appeared out of thin air.

*What you will need*_supplies

_a negative to print
_a light tight room
_running water
_safe light (red light)
_4 trays for chemicals
_enlarger with a condenser head (and bulb)
_lens (to fit in the enlarger)
_paper easel (holds the paper in place under the enlarger)
_timer
_grain enlarger
_emulsion paper
_chemical storage bottles
_thermometer
_measuring cylinder

Let's set it up

Most things are self explanatory, plug in your safe light. Set up the dark room somewhere that the door can stay shut. You also want your running water source to be nearby the chemicals.

Let's set it up_chemicals

Developer

Developer activates the light sensitive crystals that make up the emulsion on your paper. When the crystals come into contact with developer, any parts of the paper exposed to light will become some shade of black.

Stop Bath

The Stop Bath is an acid that deactivates the developer. As you put a print into the stop bath, it stops turning black. Water and lemon juice can both be used instead of stop bath, but are not nearly as effective.

Fixer

Fixer removes the unexposed crystals on the emulsion, making the paper light safe. Paper that has been through fixer can then be taken into open light without worries of turning black. Insufficient fixing will turn a picture yellow over time.

Hypo Clear

Hypo is not always used, but it helps insure uniform drying, so that you won't have any drying marks later on. You can also use water.

Let's set it up_chemicals

You will need 3 dishes and they must be labelled/ have different colours to avoid contamination of the developer. A trace of fixer in developer can lead to inconsistent results. Use the times and dilutions stated on the products that you buy. The chemicals are usually liquid concentrates. You just pour out the required amount of each, add water and stir.

Let's set it up_chemicals

Developer

The developing mix used for paper is different from the one used for film. There are changes in the proportion of water and chemical. To prepare 1000ml of developer and if the formula (written on the back of the developer bottle) used is 1 + 9 = 10 then:

1 + 9 = 10

DEVELOPERml + WATERml = 1000ml

1000ml / 10 = 100ml = **amount of developer ml** *1000ml - 100ml =* **900ml of water**

Stop Bath

The second optional step uses a so-called stop bath. The only purpose of this is to stop development by converting the print from being slightly alkaline to slightly acid. This has the effect of extending the life of the fixer so that more prints can be processed (fixer is much more expensive than stop bath!). Note, water cannot be used as a stop bath, it must be weakly acid and commercial products are either acetic (smells of vinegar) or citric acid (odourless).

Let's set it up_chemicals

Fixer

We can use the same type of fixer for fixing both film and paper; only the amounts and proportions we'll need to be changed. To prepare 300ml of fixer and if the formula (written on the back of the developer bottle) used is 1 + 4 = 5 then:

1 + 9 = 10

FIXERml + WATERml = 300ml

300ml / 5 = 60ml = **amount of fixer ml** *300ml - 60ml =* **240ml of water**

Hypo Clear

Running water.

Let's set it up_enlarger

Plug your enlarger into the timer, and the timer into the socket and attach the lens to the enlarger. Before you do anything, scope out the enlarger. You're going to have a few different knobs and levers, and you'll need to know what each one does. Because all enlargers are different, you'll just see a few different parts there will be, and the others you'll need to figure what each one does. This will help you feel much more comfortable when actually printing.


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Let's set it up_enlarger

Focusing knob

This will move the bellows (and lens) up and down (closer and farther) from the negative to focus it.

Head knob

This knob will either loosen the head so you can slide it up or down (changes how large the picture is), or it will mechanically move the head up and down.

Aperture Ring

This ring should be located on the lens, and changes the aperture. If the enlarger is turned on, you will notice the light get dimmer and brighter as you turn it.

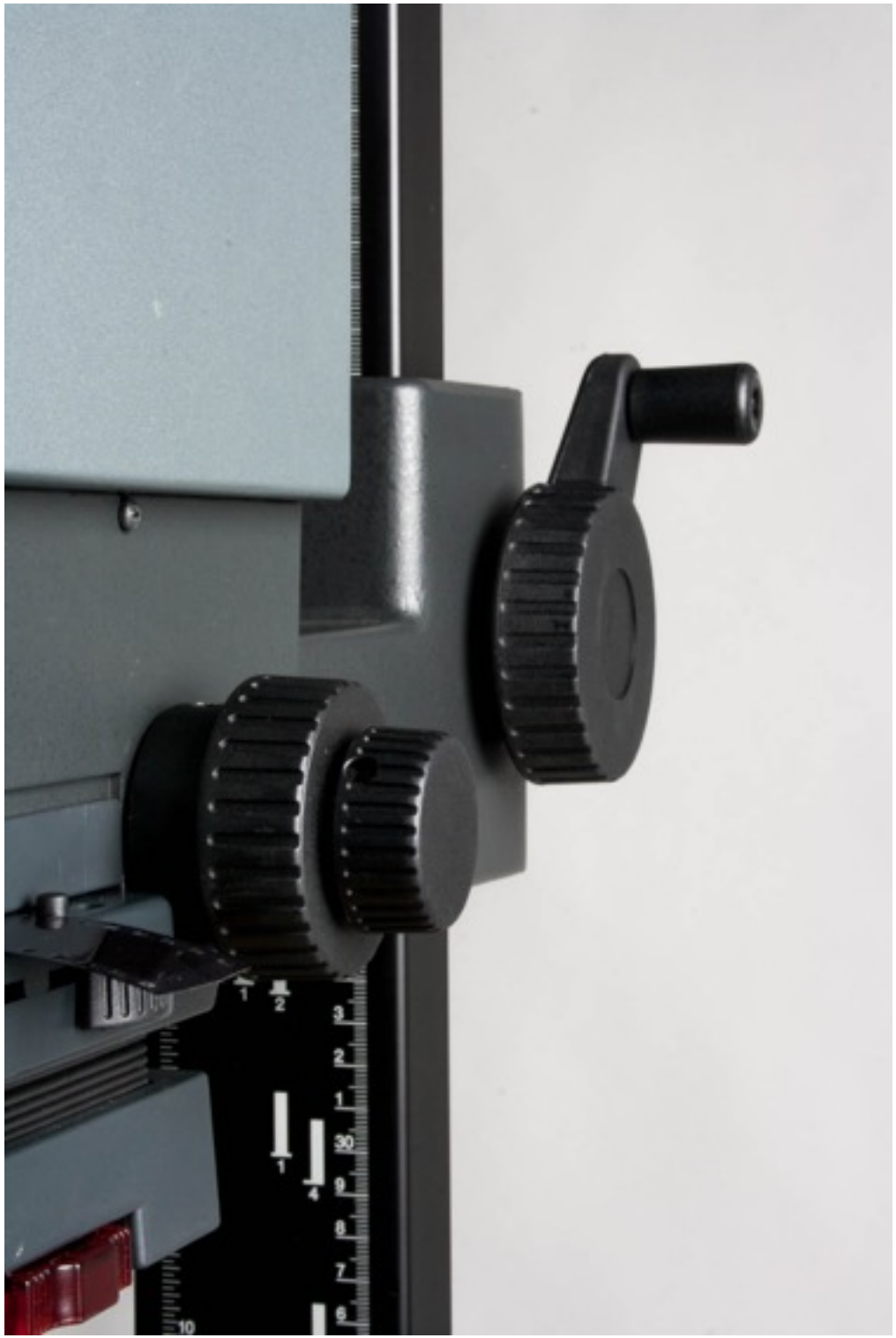
Negative Carrier

This goes between the lens and bulb, it's what carries your negative. Not much more to it than that.

Multigrade filter knob

This change a filter that controls contrast inside the enlarger head.


filter control
MULTIGRADE
SYSTEM-V
HAISER
VPM 7005
SYSTEM-V
MULTIGRADE




filter control
MULTIGRADE


filter control
MULTIGRADE


filter control
MULTIGRADE


filter control
MULTIGRADE


filter control
MULTIGRADE

Let's set it up_enlarger

Timer

Timers can be different, but their purpose is always the same: to accurately control the exposure time of an enlarger.

There are generally two switches on a timer:
f both switches are turned on, the light remains on.
If one of the switches (It does matter which one) is turned on, the enlarger will be on for as long as the timer is set to.

Having the light on continually is used for focusing your picture.

Getting ready

Now that everything is set up, and you know how to use it all, let's get ready to print!

Getting ready_loading the film

Clean the negative:

Put a little rubbing alcohol on a cosmetic pad and wipe down both sides of your negative.
Wave the negative back and forth until completely dry.

Load the negative:

Take out and open your negative carrier
Slightly bend the negative (hot dog style), and put it under the pegs that will hold it in place.
You'll need to put the negative in emulsion side down. Your negative should appear backwards, and upside down. (But will look normal when projected)
Adjust the negative so that you can see the photo you want to print.
Close the negative carrier and insert it back into the enlarger.


RAISER
VPM 7005 SYSTEM-V
MULTIGRADE


RAISER
VPM 7005 SYSTEM-V
MULTIGRADE


VPM 7005 SYSTEM-V
MULTIGRADE

Getting ready_bonus step!

In the previous step, you may have noticed that the negative needs to be put in emulsion side down.

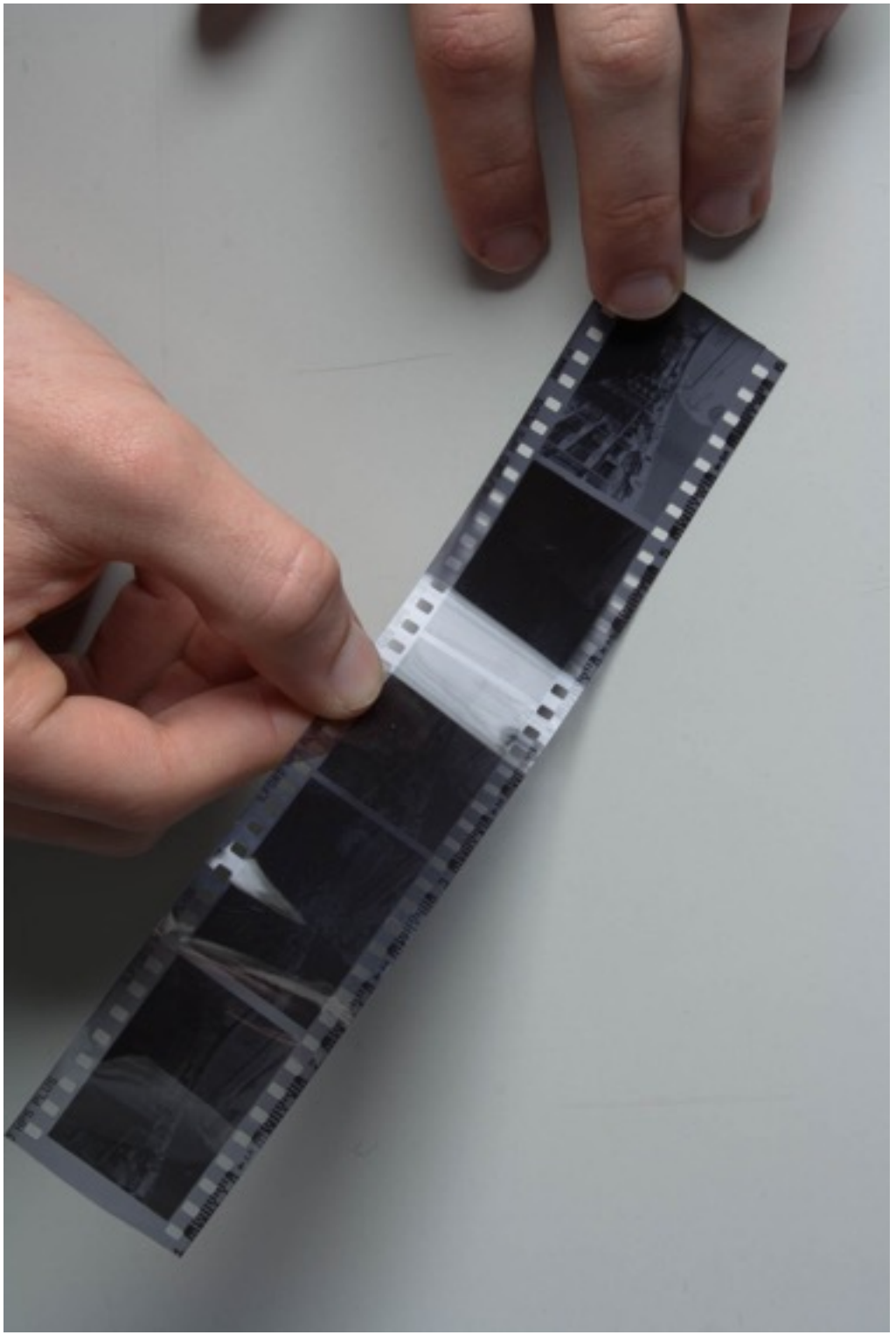
But what does that mean?

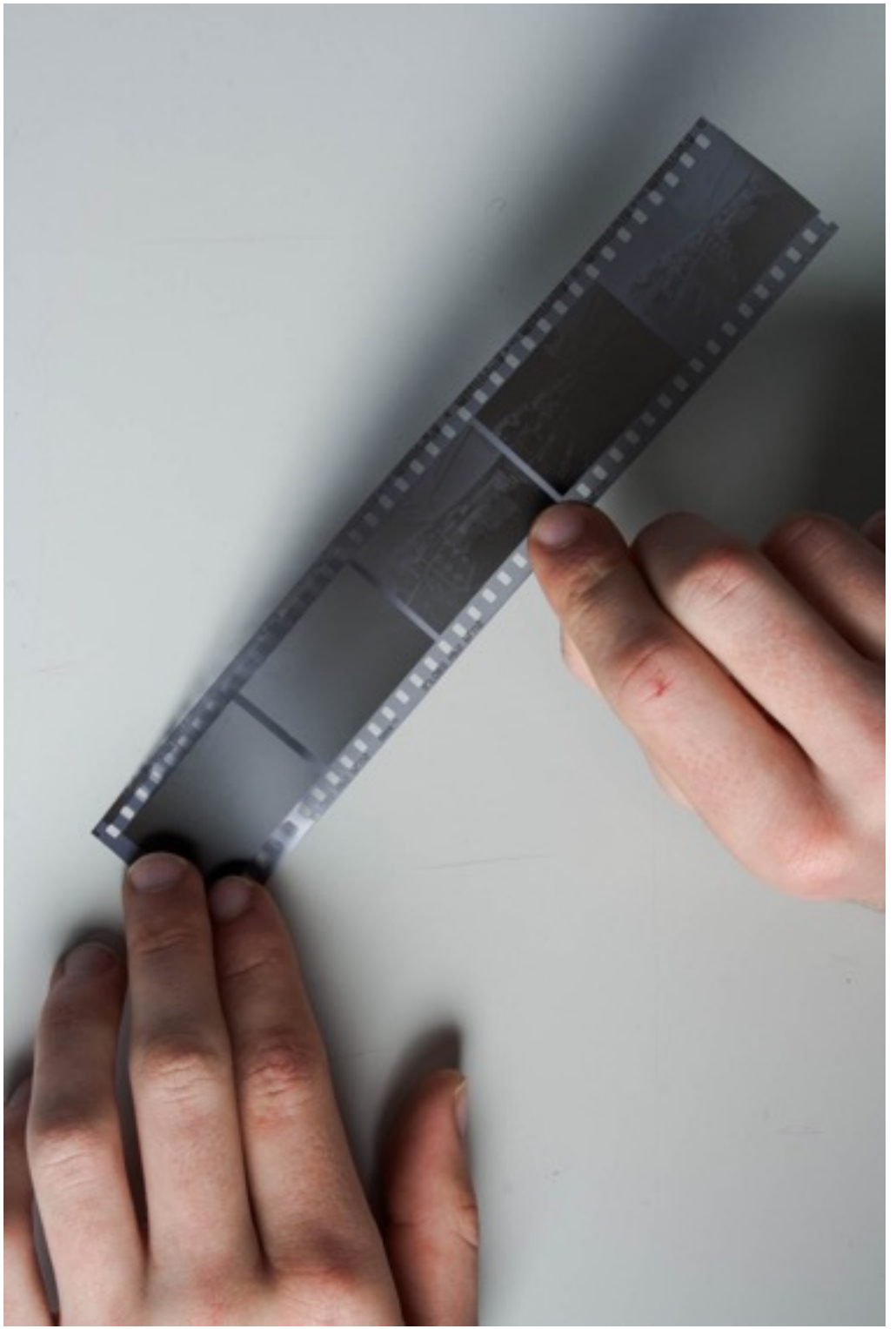
Film is made of two major components:

_A plastic strip
_Emulsion

It's as simple as that; a plastic strip with a thin layer of emulsion on it. The plastic serves as a base for it, when the unused crystals are washed off by the fixer, the plastic remains to give the negative substance.

You can tell which side is emulsion, because the plastic side is shiny and smooth.





Focus your picture

We've got the negative in, since you already know how to focus the enlarger itself, pick up the grain enlarger.

Getting ready_Focus your picture

Turn on the enlarger, and open the f-stop to the widest aperture (the light will be brightest).

Position the easel underneath your enlarger, and raise/lower the head so that you like how the picture is copped on it.

_If you don't see any picture, but the light is on, check to make sure it's not tremendously unfocused.
If you don't have a grain enlarger, this is where the road (or step) ends for you. Just focus the image to the best of your ability (Don't worry, you can usually do pretty well without one) and then turn it off.

If you do have a grain enlarger, follow these steps:

Place it under the enlarger (with the light turned on)

_Be careful not to block the light with your head

Find a bright white dot through the eye piece of the grain enlarger - you may only be able to find it by backing up a bit.
Slowly get closer to it, looking at the white dot, once you're all the way up to it, you'll be able to tell whether or not it is focused.

_If it is, each and every dot (pixel, for those of you used to digital) will be clearly visible. If you can't see the grain, turn the focusing knob until you can.

Voila, you're focused! Go ahead and put the grain enlarger away, and turn off the enlarger.

Test Strips

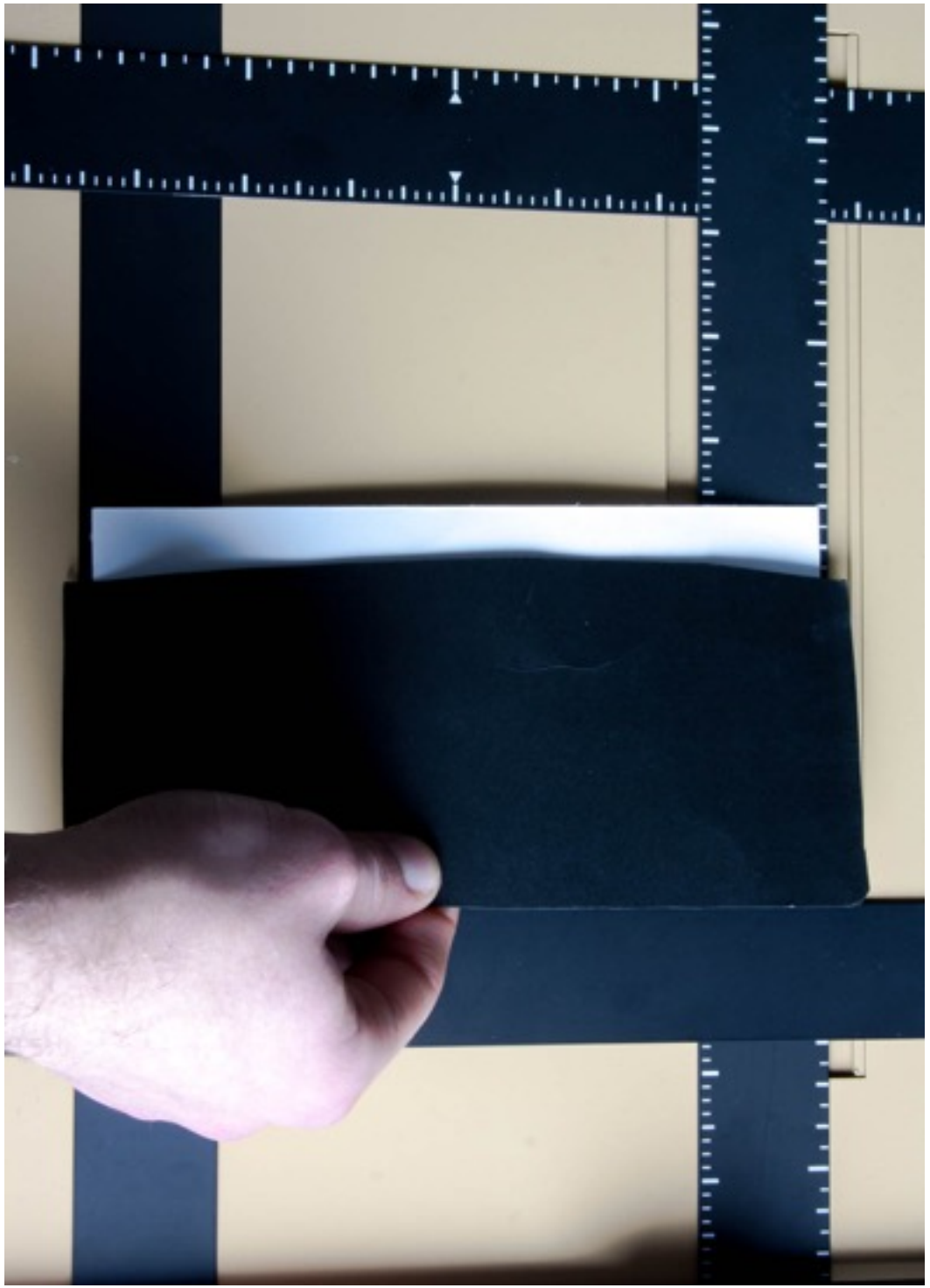
Test strips are used to determine how long to expose your photo for. They are simply strips of your photographic paper that you expose for different amounts of time. Take one sheet of paper, and cut into ~3cm strips.

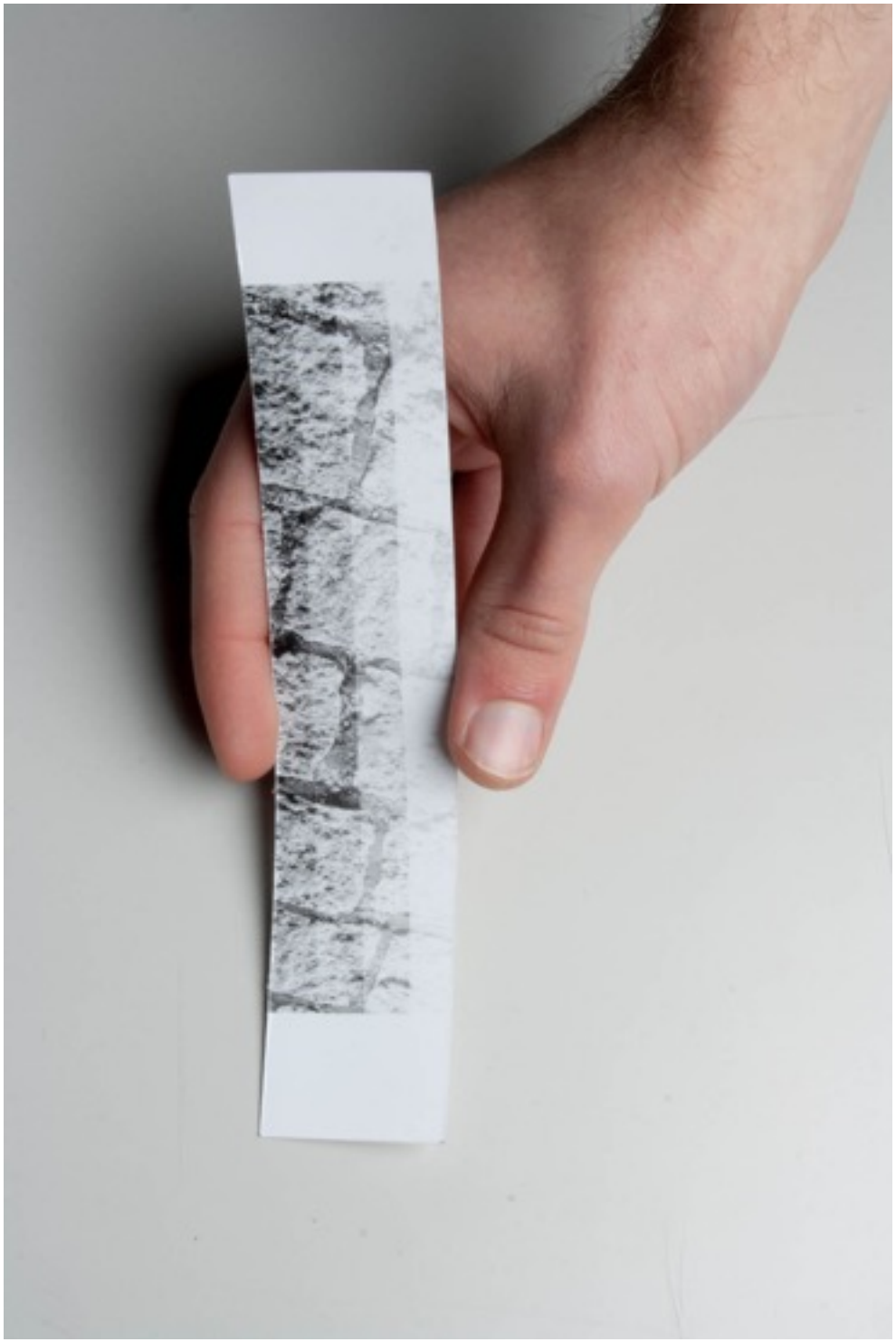
Test strips

To use the test strip:

Set your f-stop to the smallest aperture (you'll get the best quality this way)
Lay one strip diagonally across the easel.
Set your timer to 30 seconds
Using a piece of something opaque, expose about a quarter cm every 5 seconds. - You will have bars on the paper when you develop it, one exposed for 5 seconds, one for 10, one for 15, etc. all the way up to 30.
Process the test strip as usual through fixer (more on this later)
Wash it off
Take it out into the light and find which bar looks the best. If the best would be a mix between 5 and 10, go for 7 or 8. The time that you pick will be how long you expose the entire photo for.

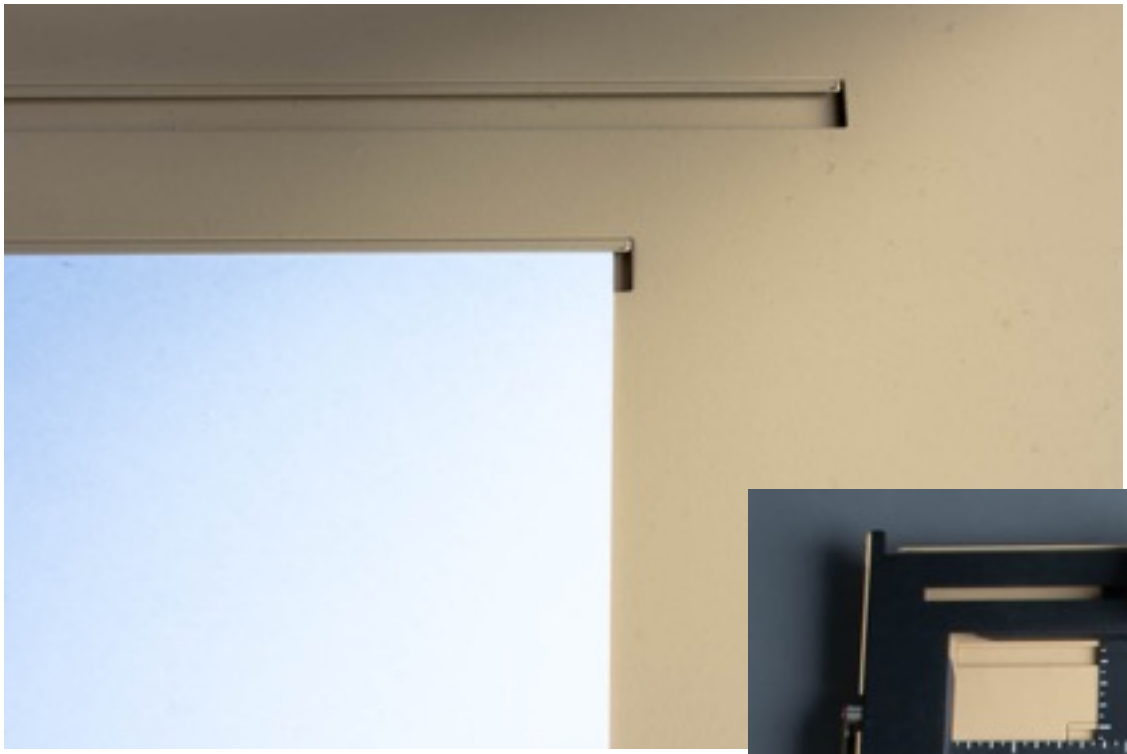
_If all the bars are too dark, make another test strip that goes from 1 second to 5 seconds in increments of 1. If they're all too light, make a test strip that goes from 60 to 30 in increments of 5.

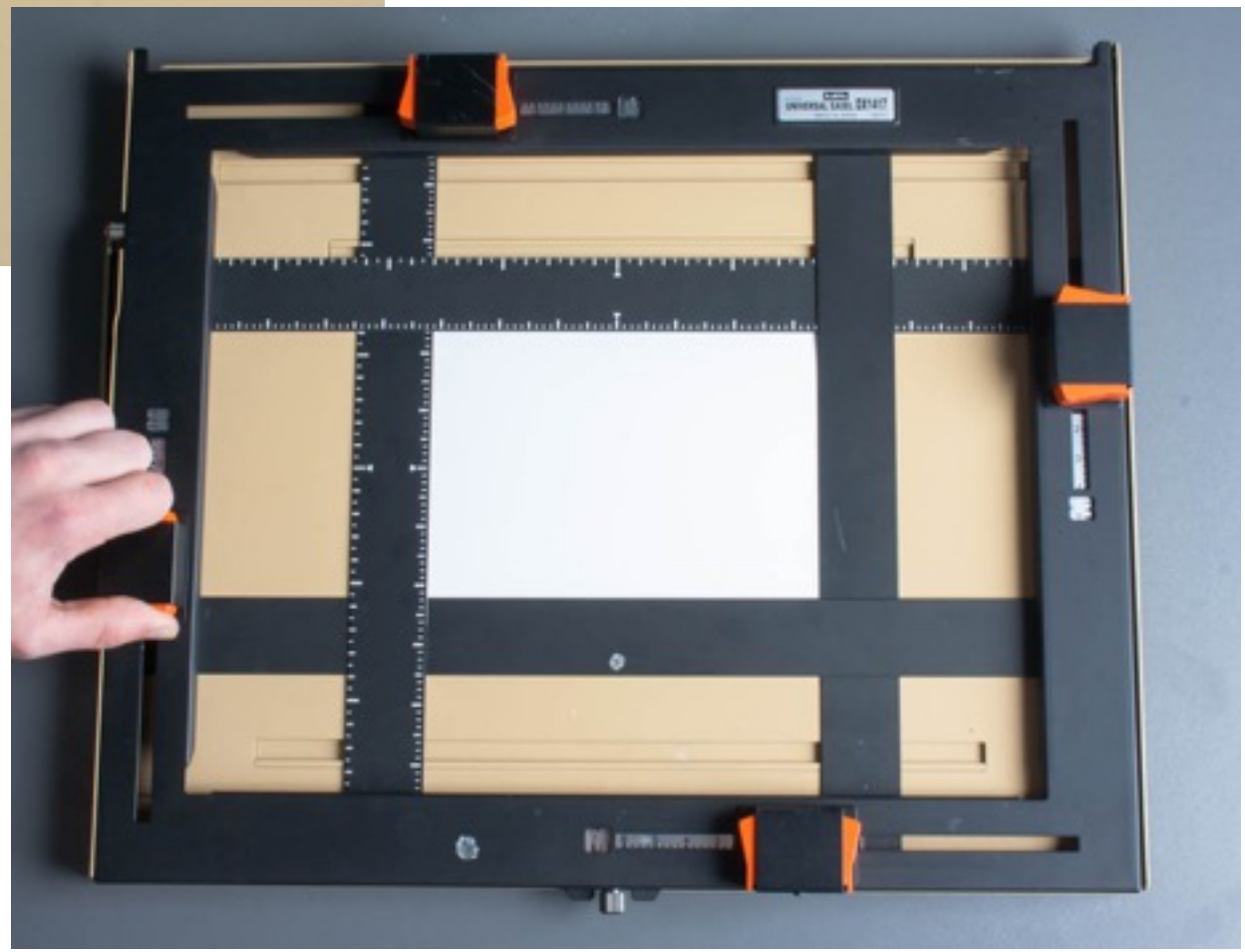




Print the photo

Finally - The moment you've been waiting for! You're ready to make your first print.

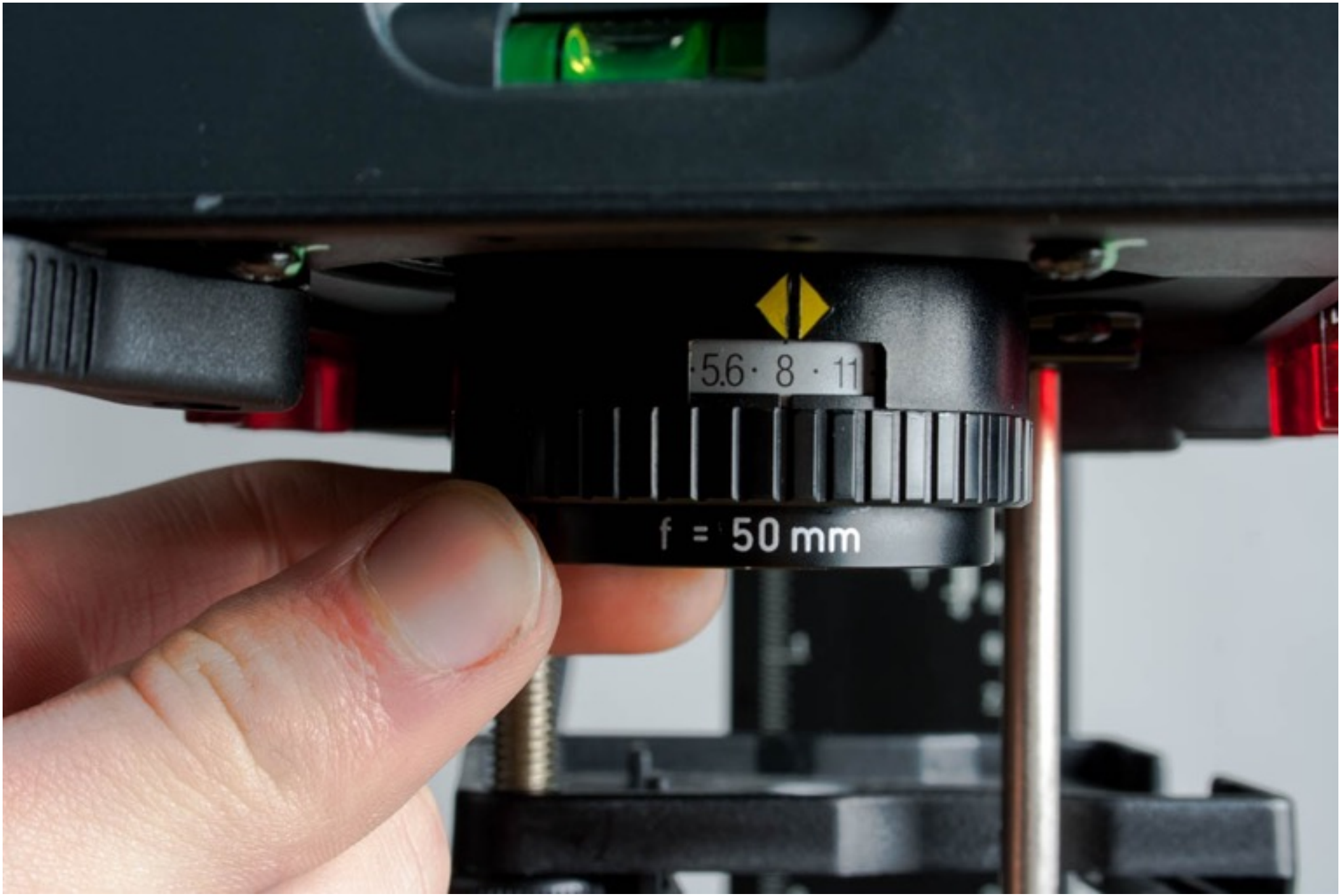




Print the photo

Set your f-stop to the smallest aperture (you'll get the best quality this way)
Insert a full piece of paper into the easel
Set the timer to the time that you picked from your test strip.
Turn on the timer and allow the paper to be exposed
Process the paper through the chemicals (more on this in the next step)

_Don’t move anything on the enlarger until you've gone out and seen the picture in normal light (after it's been fixed), just in case there's something about it you don't like.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f = 50 mm


KAISER digital timer
time
reset
start
stop

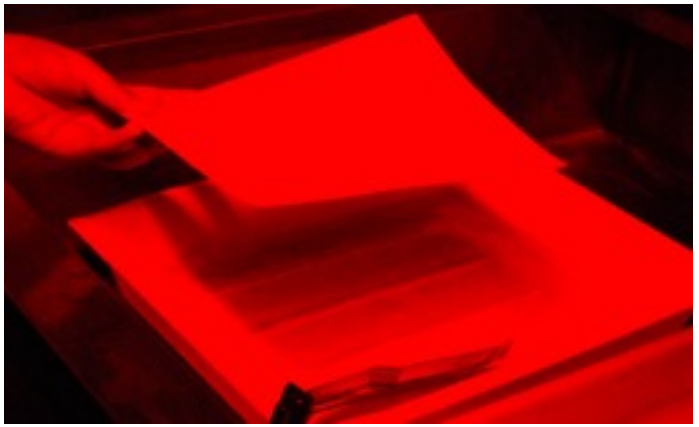
Developing paper

All of your times will vary based on what chemicals you use. Always follow the instructions given to you on the packaging.

Print the photo_Developing paper

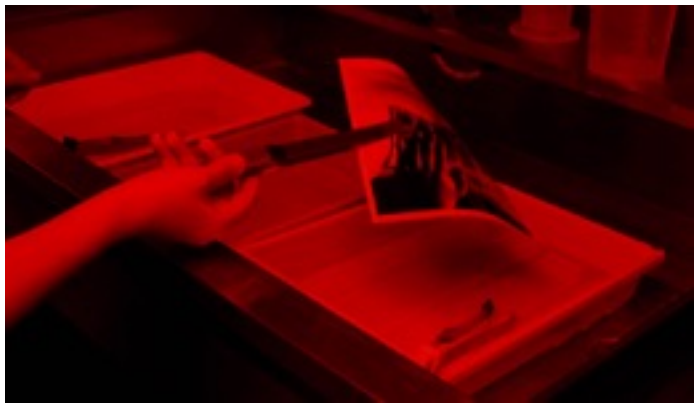
The work flow to follow when developing goes as follows:

Put paper in developer, agitate (rock the tray back and forth) for the required amount of time.
Put paper in stop bath, agitate for the required amount of time.
Put paper in fixer, agitate for the required amount of time.
Rinse print in water
Put paper in hypo clear/water, agitate for the required amount of time.
Rinse print for ~10 minutes to make sure all the chemicals are off the paper
Squeegee the paper to get most of the water off
Dry your photograph.









Burning and dodging

Sometimes part of your picture is unproportionately lighter or darker than the rest of your picture. This may be a sky that's to bright, or a shadow that's too dark, but whatever it is, you don't want it like that. If this happens, burning and dodging is called for.

Burning and dodging

The concept of burning and dodging is that you allow part of your picture to be exposed longer than the rest of it.

How to burn and doge?

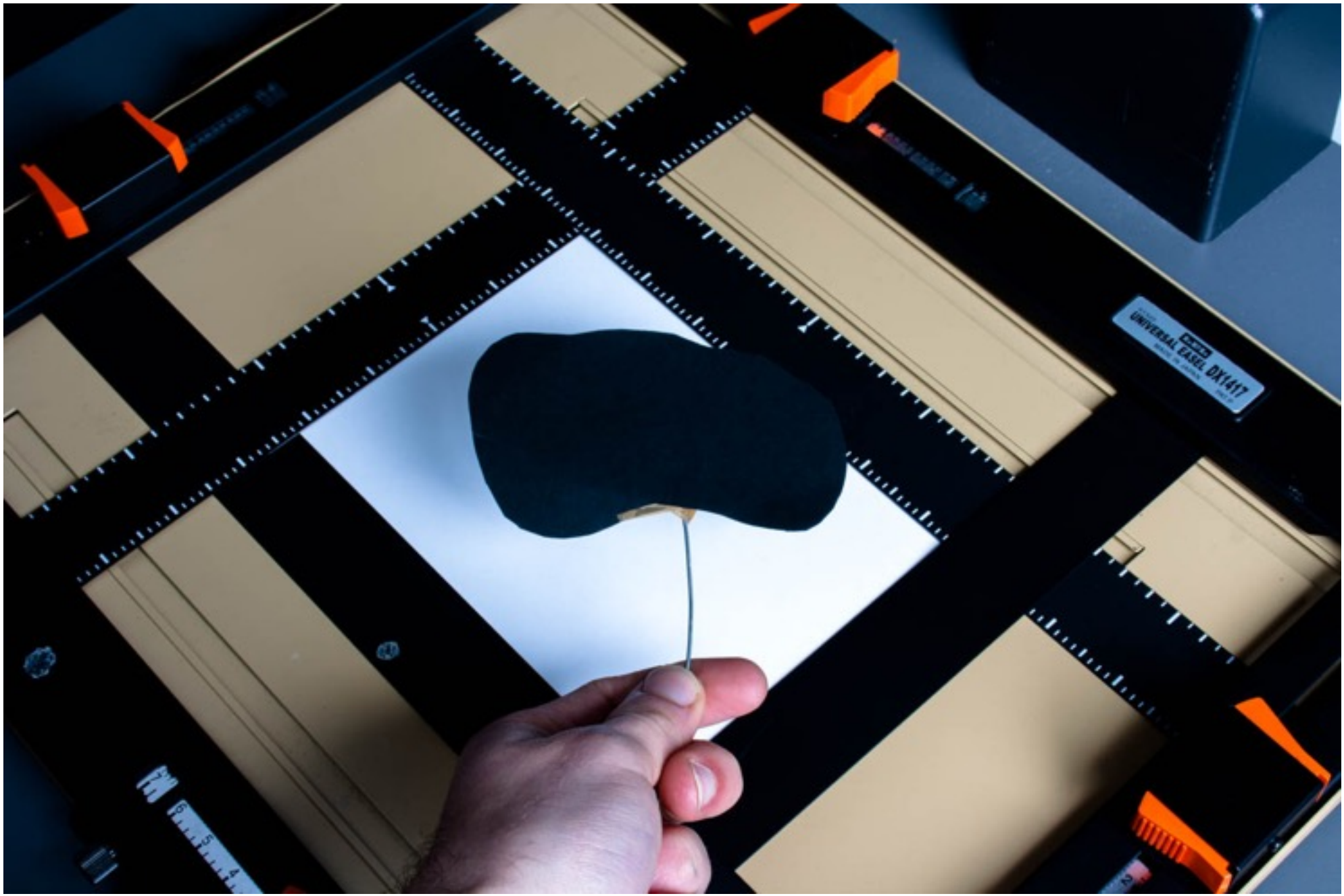
_If you want part of it to be darker, expose that part longer
_If you want part of it to be lighter, expose that part for less time

Different implements can be used to accomplish burning and dodging, including your hands, a cut out shape, etc.

_Use a test strip to figure out the different times needed for different parts of the picture.

_Whatever you use to block light from touching part of the paper, make sure to wave it back and forth some, to avoid sharp lines of light. For exacmple, if you cover someone's head with your finger, it will not look natural, but like a finger. If you wave your finger back and forth, there will be a gradient that only lightens and darkens the part of it, without any visible shapes.

_It's important to not give up when burning and dodging, it can take a few prints before everything is just right. You also may need to expose multiple areas for multiple times.


UNIVERSAL EASEL DX1417

General Warnings

General Warnings

The chemicals used in developing can cause dry rashes, warts, etc to some people. You can wear gloves or use tongs, if you want - but be careful not to contaminate the chemicals with each other.
Developer can cause brown fingernails...
Don't swallow or get any of the chemicals in your eyes

Staining

Fixer stains clothing. You can either designate clothes for printing, be careful, or wear an apron.
Be sure to clean up, if you let chemicals sit on surfaces, they will discolor eventually.

!Do not consume food or drink while printing!

!Turn-off your mobile and all devices!

So the screens' light doesn't ruin up the process

Paper Warnings

Be careful not to bump the easel while the paper is being exposed
Always put your paper in the black bag it comes in before taking it out of the dark room
Safe lights can eventually expose your paper, so don't leave it out, even in the dark room. Take out paper as you need it. Also, use as weak of a light as possible.

You just did it!

Escola Artística Soares dos Reis_Porto School of Arts

_Photography (Audio & Visual Communication Course)

_Pictionary and tutorial by Gonçalo Alexandre & Sara Loureiro (12D2 / 2015-2016)