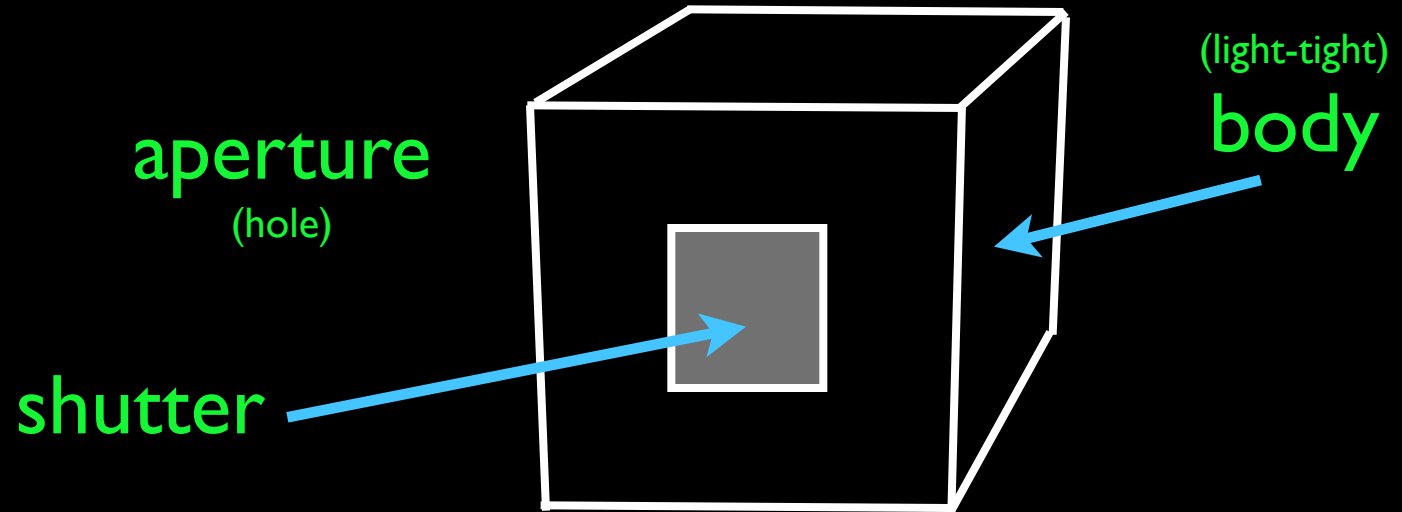


Pinhole Photography



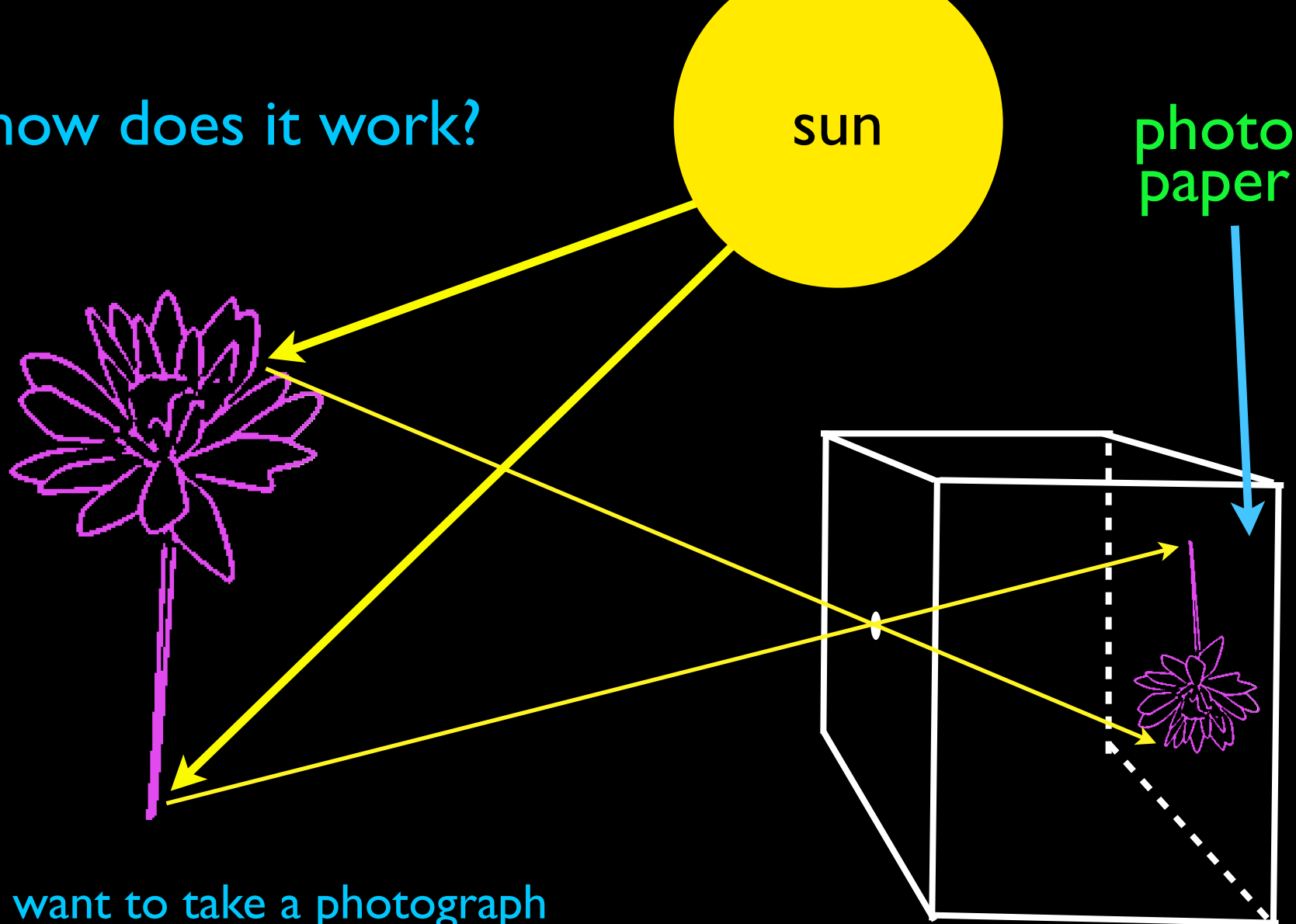


what are the only things you NEED
in a pinhole camera?



(and something light-sensitive if you want to make a permanent image)

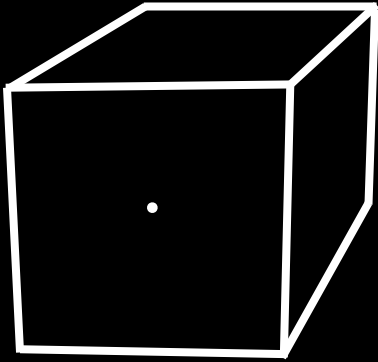
how does it work?



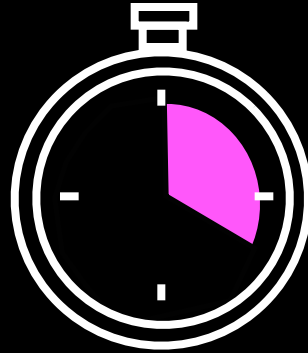
I want to take a photograph
of this awesome thing

your pinhole camera doesn't have "settings"...

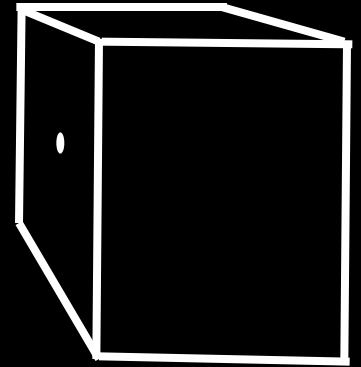
but what can you control?



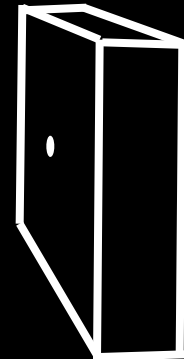
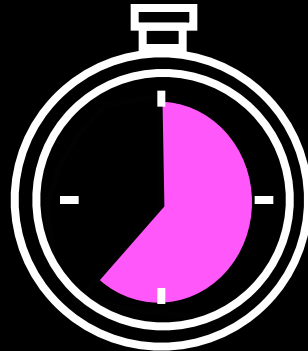
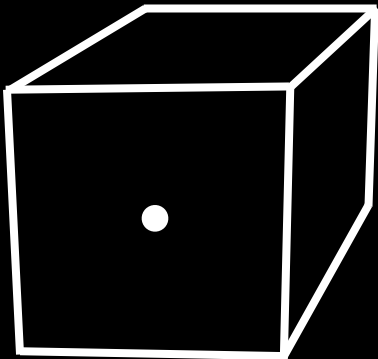
aperture size



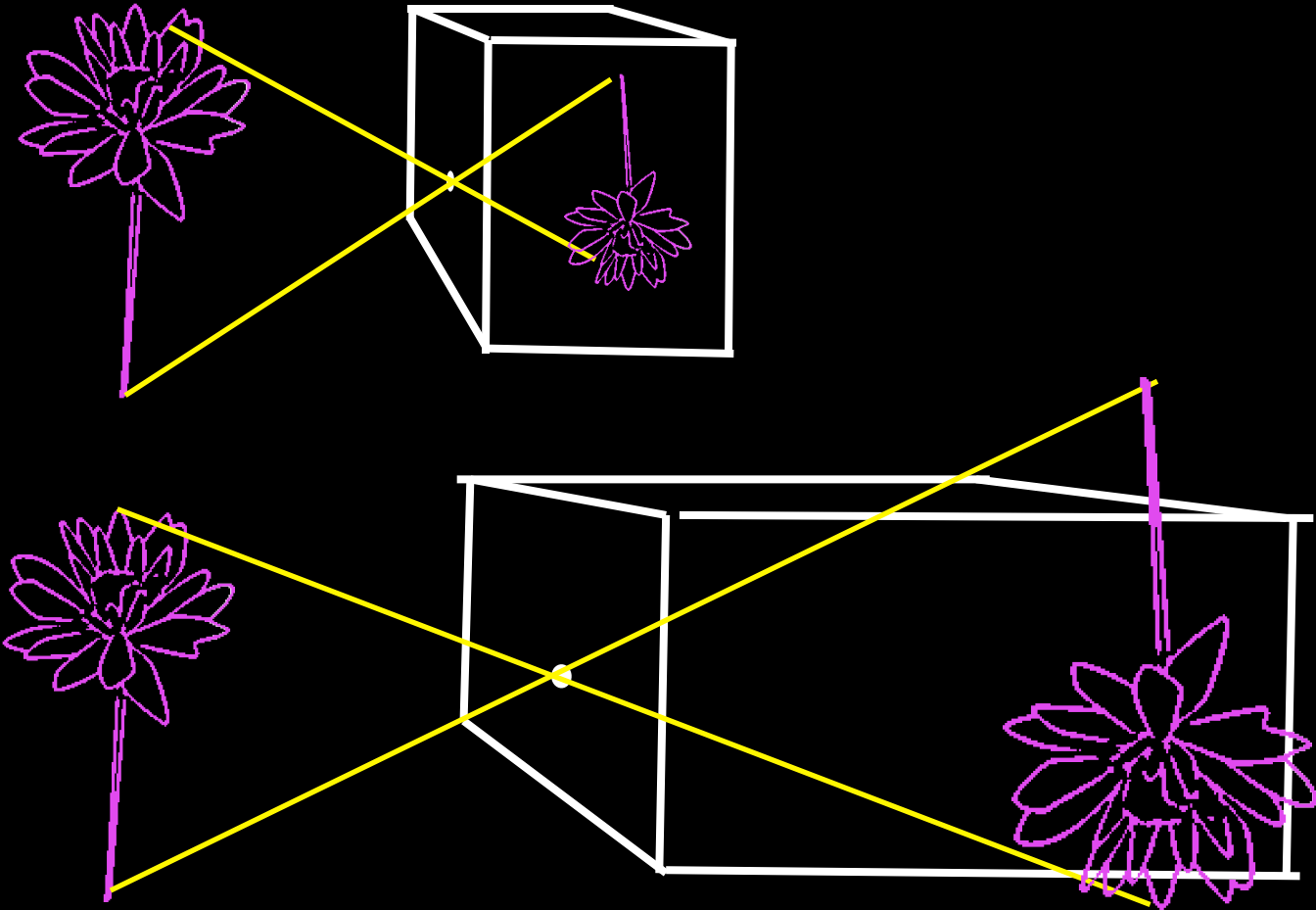
exposure time
(how long is the shutter open?)



focal length
(aperture to paper)

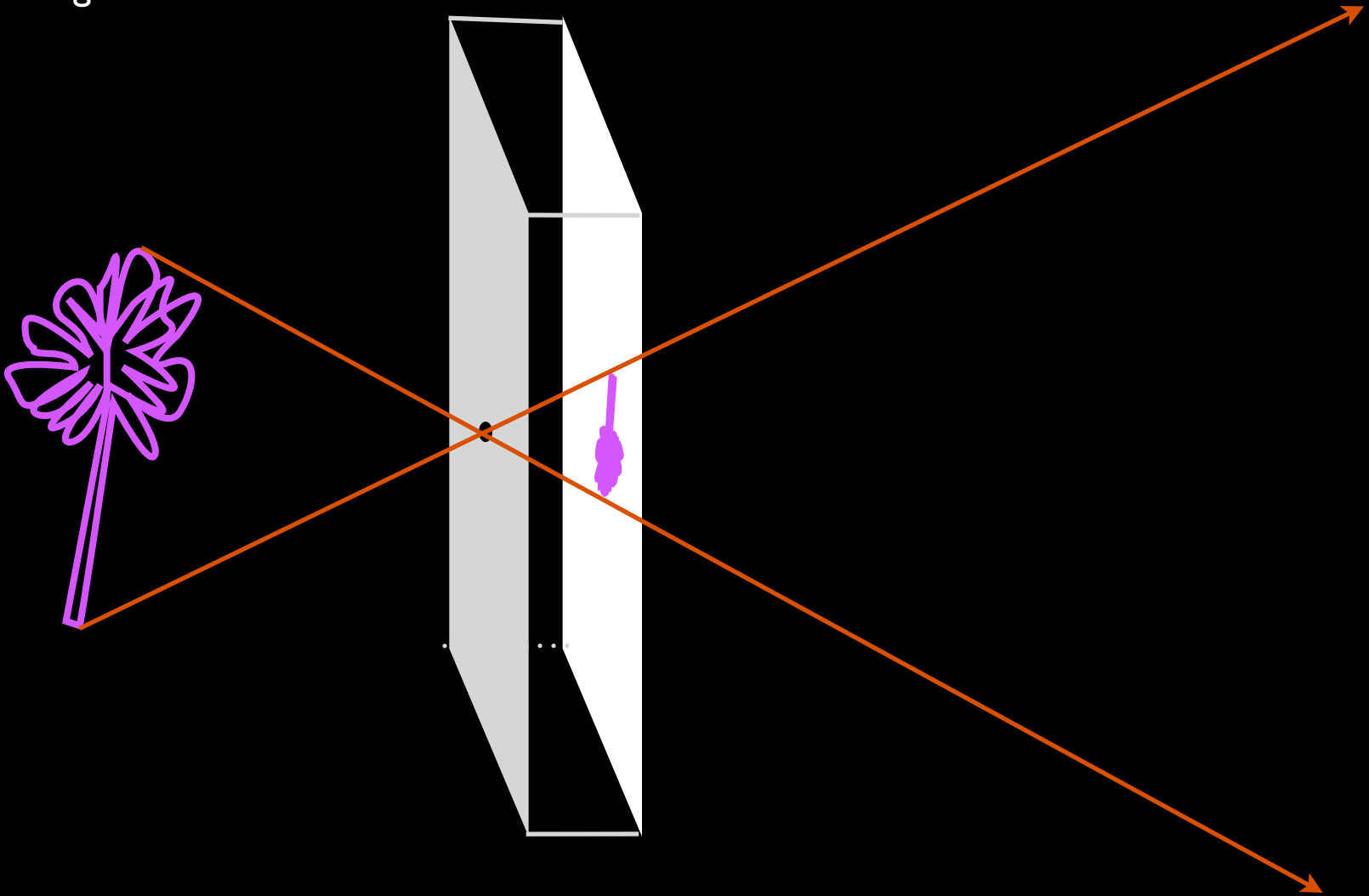


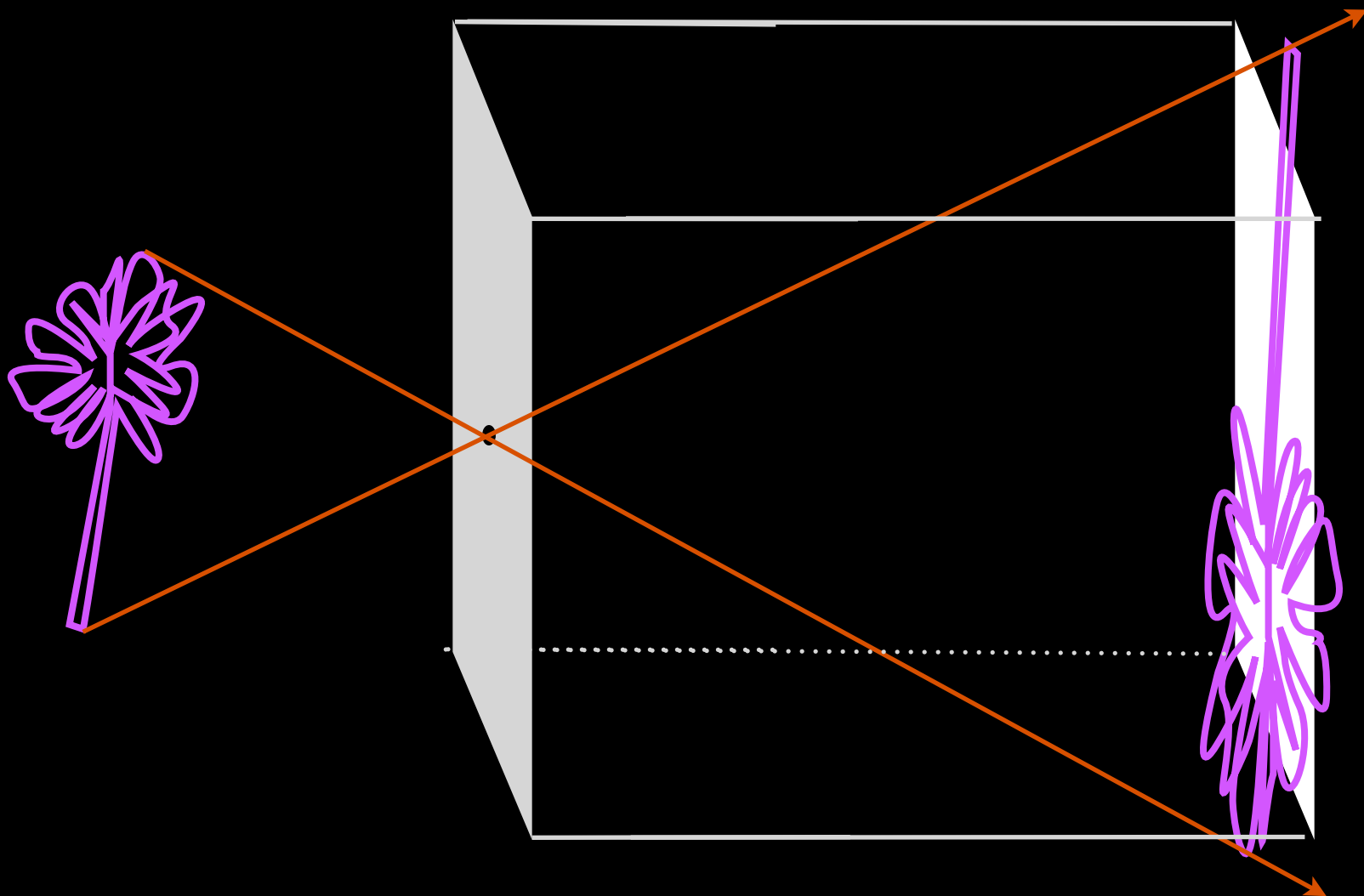
FOCAL LENGTH - affects how zoomed in the image is



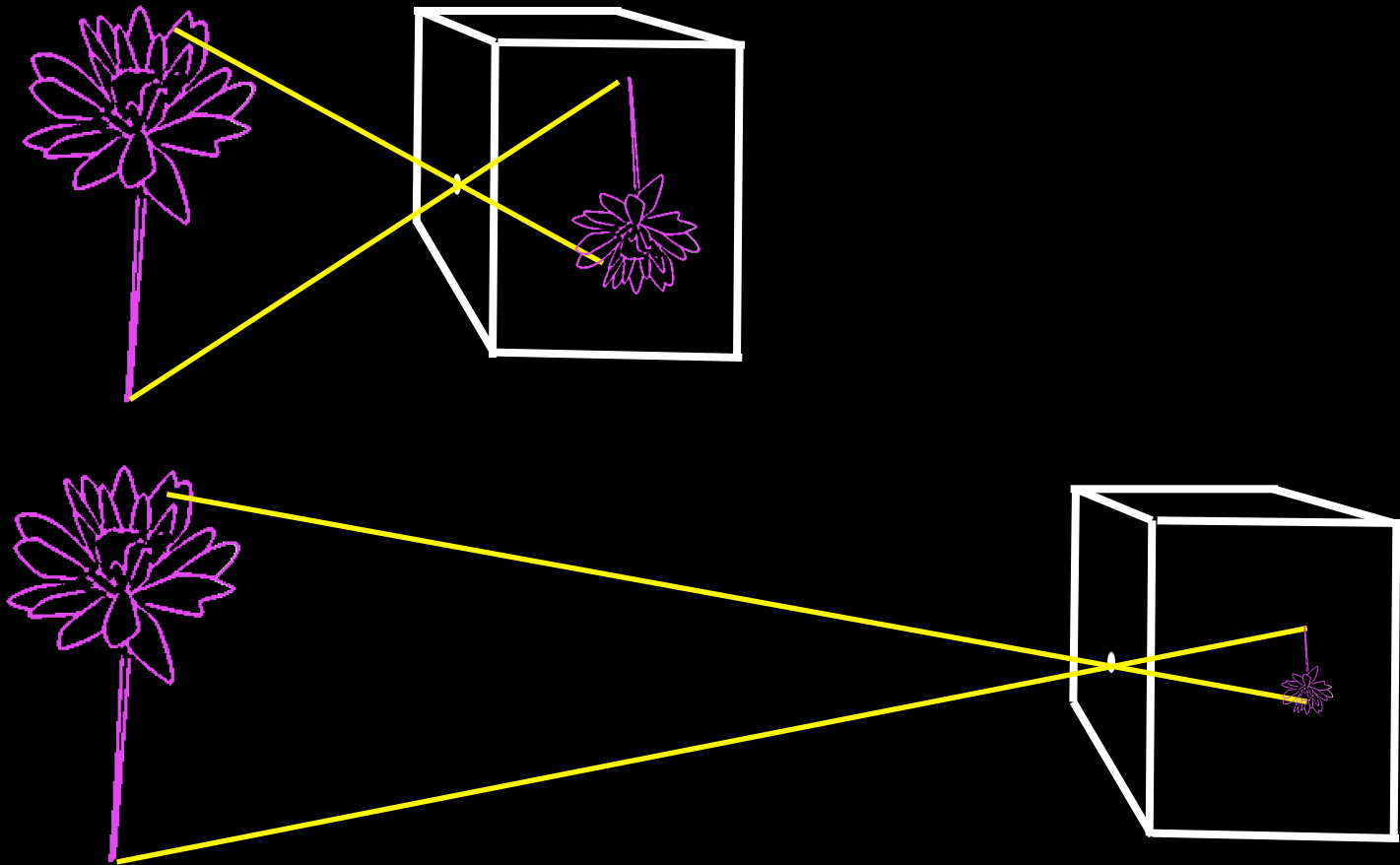
How did the size of the hole in our room window affect the image?

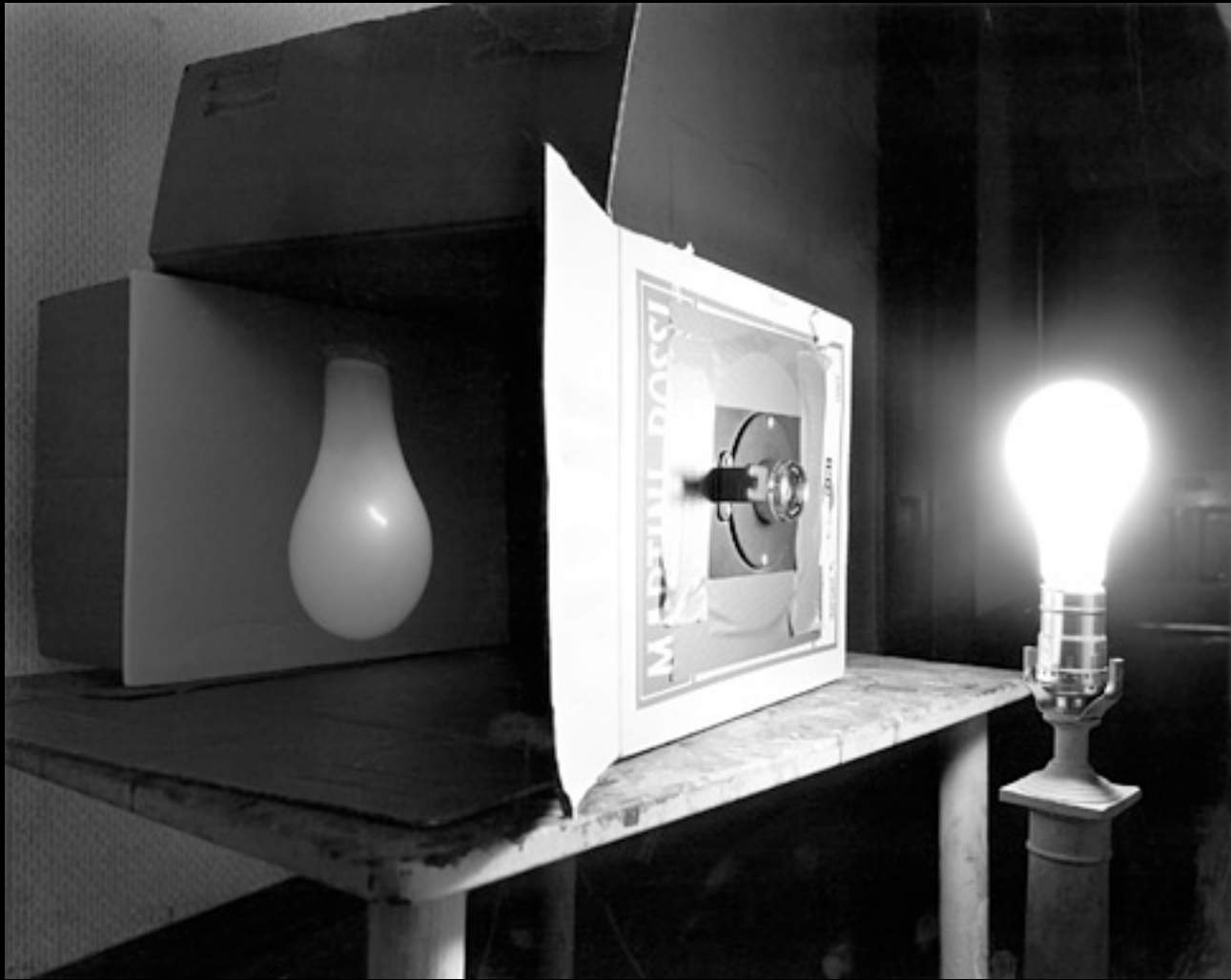
Moving the focal plane (tracing paper or photo paper) changes the size and focus of the image.





ALSO - you can control how far away your camera is from what you are photographing





Calculate your Aperture

$$\text{Aperture Diameter} = 1.9 \sqrt{\text{Focal Length} \times \text{wavelength of light}}$$

Wavelength (usually the wavelength for yellow/green light 0.00055 mm is used)

$$\text{Aperture Diameter} = 1.9 \sqrt{101.6\text{mm (4'')} \times 0.00055\text{mm}}$$

$$0.446\text{mm} = 1.9 \sqrt{101.6\text{mm (4'')} \times 0.00055\text{mm}}$$

$$0.017'' = \text{Aperture/Pinhole}$$

Calculate your f-number

The f-number of the camera may be calculated by dividing the distance from the pinhole to the imaging plane (the [focal length](#)) by the diameter of the pinhole. For example, a camera with a 0.02 inch (0.5 mm) diameter pinhole, and a 2 inch (50 mm) focal length would have an f-number of $2/0.02$ ($50/0.5$), or 100 ($f/100$ in conventional notation).

$$f\text{-number} = \frac{\text{Focal Length}}{\text{Aperture Diameter}}$$

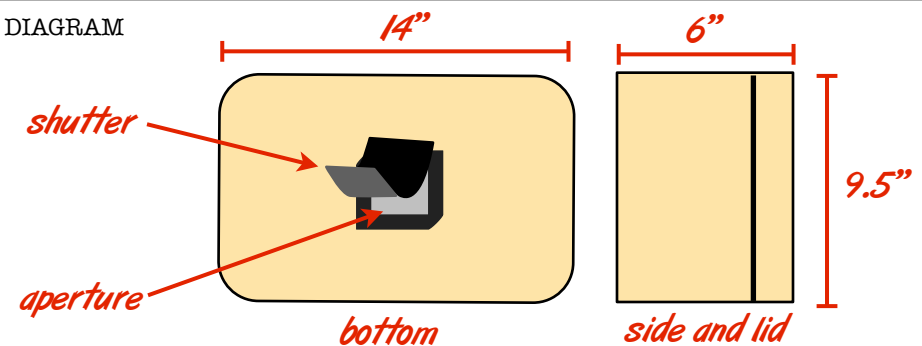
$$f\text{-number} = \frac{4 \text{ inch}}{0.017'' (0.45\text{mm})}$$

$$f/235 =$$

Aperture & Focal Length

Diameter	Best Focal Length	F-stop
.036"	20"	f/550
.031"	15"	f/490
.029"	13"	f/450
.026"	10"	f/390
.023"	8"	f/350
.020"	6.5"	f/300
.018"	5"	f/280
.016"	4"	f/250
.013"	2.5"	f/190

Pinhole Photography

NAME		<i>Cecil</i>		<div>DIAGRAM</div> 	
FOCAL LENGTH		<i>6 inches</i>			
APERTURE DIAMETER		<i>0.019"</i>			
	EXPOSURE TIME	DISTANCE TO SUBJECT	WEATHER	SUBJECT MATTER	RESULTS
1	<i>2 min</i>	<i>6'</i>	<i>sunny</i>	<i>me</i>	<i>too dark</i>
2	<i>1 min</i>	<i>4'</i>	<i>sunny</i>	<i>me</i>	<i>too dark, LIGHT LEAK</i>
3	<i>1 min</i>	<i>4'</i>	<i>sunny</i>	<i>me</i>	<i>dark, LEAK</i>
4	<i>1 min</i>	<i>4'</i>	<i>sunny</i>	<i>me</i>	<i>Yay! too light</i>
5	<i>1:30 min</i>	<i>6'</i>	<i>sunny</i>	<i>class</i>	<i>Yay! Success</i>
6	<i>2 min</i>	<i>50'</i>	<i>cloudy, foggy</i>	<i>school</i>	<i>success, foreground a little light</i>
7	<i>5 min</i>	<i>1'</i>	<i>cloudy, foggy</i>	<i>fence</i>	<i>A little light</i>

water

fixer

stop bath

developer

what do I do?

cleans the print
(washes off all
the chemicals)

stabilizes
the image
(removes unexposed
silver from the paper)

stops the
developing
(low pH = acid,
neutralizes the
developer)

develops the paper
(oxidizes silver)
(pH 11 or 12 = base)

how long?

5 minutes

5 minutes

30 sec

1 1/2 minutes
(90 sec)

I should be replaced
when...

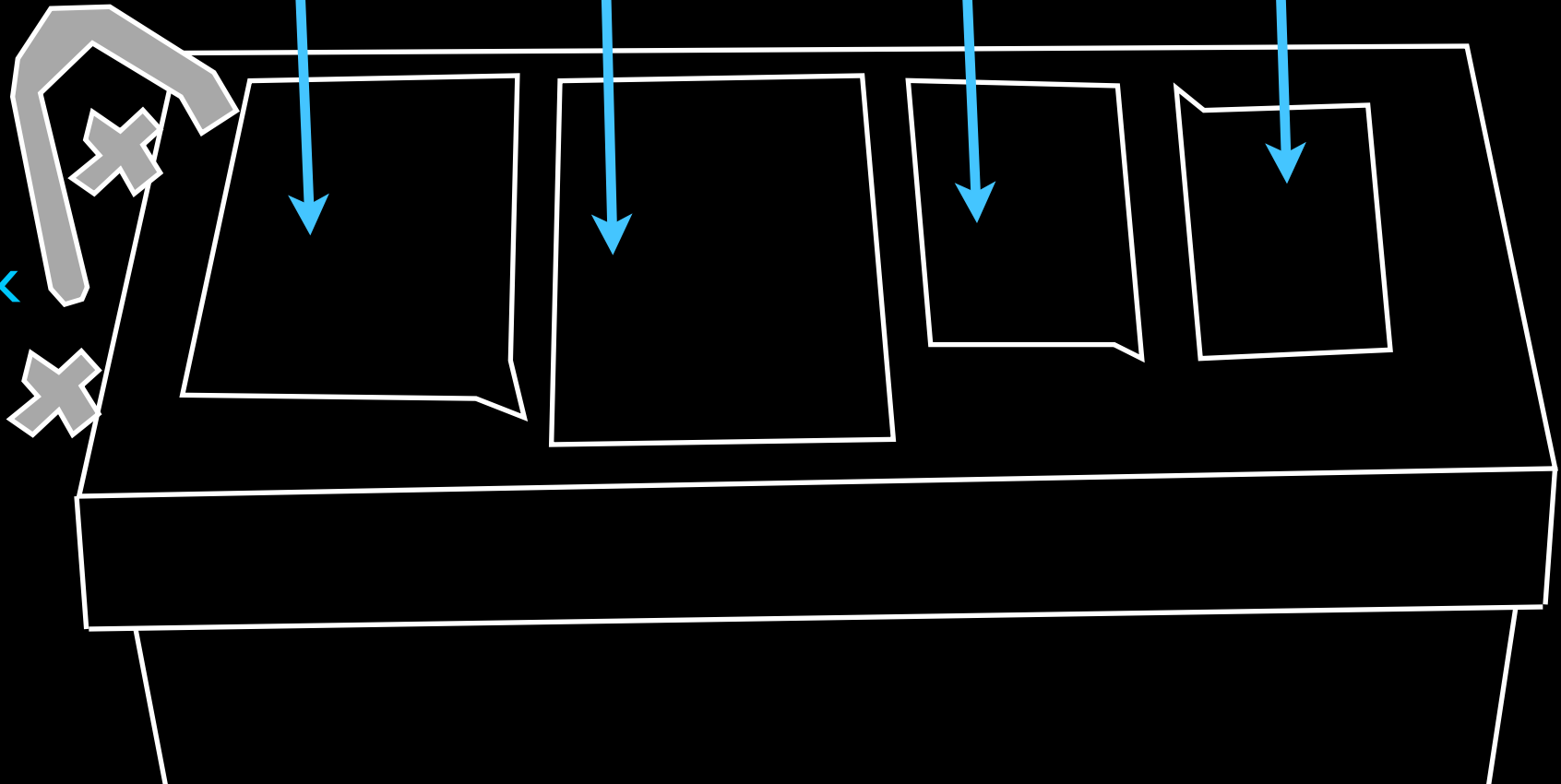
N/A

if I get cloudy when
you drip hypo check in

if I am a dark
purple color

if I am a brown color

sink



Keep tongs organized & drip off prints



Check to see if chemistry is exhausted...



DEVELOPER turns brown



STOP BATH turns purple

Hypo Chek turns cloudy when dripped into FIXER



If so, developer and stop go down the drain, fixer goes in the bucket

A Good Pinhole Negative

Contrast

white, black, & gray values

Focus

steady the camera

Subject Matter

something close and far away

























