Name:
Period:

Pinhole Camera Lesson Plan

Introduction: The Pinhole Camera is a project-based activity. Students will develop a basic understanding of basic optics and the workings of a simple camera.

Timing: This activity should take about 180 minutes to complete.

Learning Objectives:

There are five objectives for this project. They include:

Build the camera - This involves following the instructions stated below.

Taking pictures - This will require a sunny day or at least semi-bright light.

Developing pictures - This will usually happen immediately after you take the picture so you can see the results and change your methods accordingly.

Photo collage – Your top four photos will be presented. Make sure to include a description of how each picture was taken and what can be seen.

Reporting – You must produce a Prezi, explaining the details and the process of camera construction, picture taking, and picture development.

Guiding Question: What is a pinhole camera and how does it work?

Materials: This project requires a container with a lid, black duct tape, clear tape, black construction paper, aluminum foil, push pin, fast photographic paper, paper developer, and fixer. Have students bring their own shoeboxes, everything else can be found at a photo shop or a hardware store. The only difficulty will be finding a dark room.

Photocopy enough activity sheets for a pair of students to have one sheet.

Procedures:

The process of constructing the camera, loading the film, and taking the picture is pretty straight forward. The students should have no trouble following the procedure. The only mistakes tend to be:

-pinhole is too big

-box is not light tight

-exposed the film for too long

-moving the camera will it is taking the picture

-loading and unloading film in semi-dark room

Developing the film is a challenge. You must have a dark room. A closet can work, but you must seal the

door. Developing is a trial and error process. Test a few of your own pictures out first and work out the kinks before students give it a try.

The report and collage will take some time to put together. Assigning some of it for homework might be required.

Assessment: The project will be assessed for camera construction, collage of picture, and project report. The provided rubric explains the details.

Answer Key:

Rubric is provided

Name: _____

Date: _____ Period: ___

Pinhole Camera Project

Introduction: Today you will start the camera project. After the project is completed you will be require to grade yourself and another student

The project can be broken into the following stages:

- **Build the camera** - This involves following the instructions stated below.
- **Taking pictures** - This will require a sunny day or at least semi-bright light.
- **Developing pictures** - This will usually happen immediately after you take the picture so you can see the results and change your methods accordingly.
- **Photo collage** – Your top three photos will be presented. Make sure to include a description of how each picture was taken and what can be seen.
- **Reporting** – You must produce a Prezi presentation that details the process of camera construction, picture taking, and picture development.
- The camera will also be graded, so plan on turning it in with the collage of images you take.

Safety First: When building and developing you will be using sharp tools and dangerous chemicals. Use common sense and follow instructions safely.

Materials: container with a lid, black electrical tape, clear tape, black construction paper, push pin, fast photographic paper, paper developer, and fixer.

Instructions:

***Part 1: Construction* (50 pts)**

- Use black construction paper to line the inside of the box completely, except for the lens opening.
- Cover all the seams, both inside and outside with black tape. Make sure all the seams are covered.
- The can must be light-tight, so check the cover for looseness.
- Cut out a piece of black construction paper and the size of the lid. Tape the piece of black paper inside the lid and tape the seams with black tape. Make sure you can remove the lid on and off the container. Make sure all the seams are taped shut.
- Poke a small hole in the center of the bottom of the can. Use sandpaper and sand

it. Make sure you can see through it clearly.
- Cut a small piece of black tape and cover the pin hole this is the shutter of your camera. A shutter is basically a flap hinged with a piece of tape.
- Decorate the outside of the camera with black and white images of your passed projects. Tape down securely with clear tape.

Part 2: Loading Film (20 pts)

- Loading film must happen in a dark room, the photographic developing type or literally a dark room. Photographic paper is sensitive to light, so anything other than a completely dark room will expose the film.
- To load the photographic paper, open the box and tape the paper into the back of your camera, opposite the pinhole. The shinny side should be facing the pinhole. Use normal tape to attach the paper.
- Close the can using the black tape, tape around the box top to ensure that it is light-tight.

Part 3: Taking Pictures (20 pts)

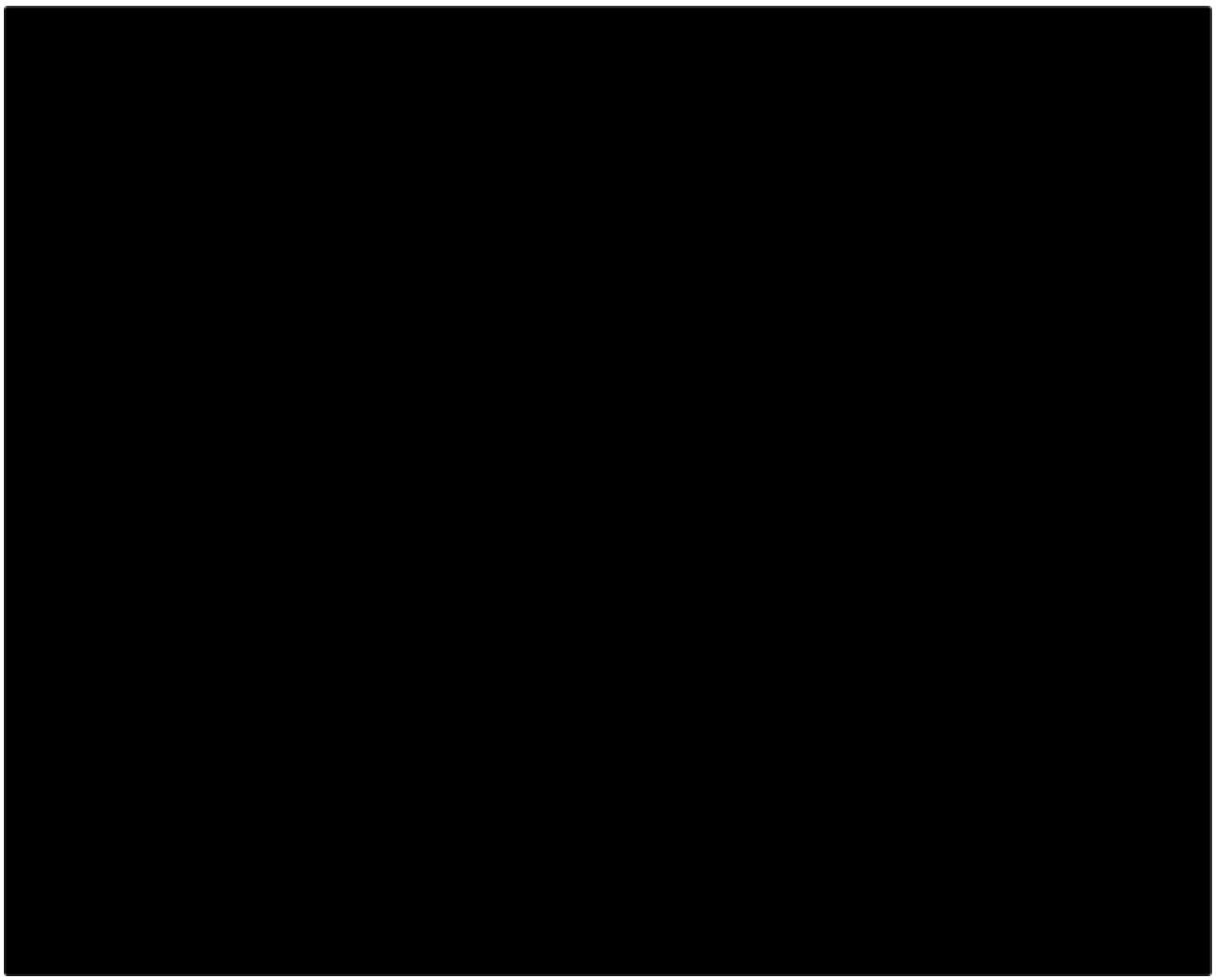
- Find an image that you would like to capture.
- Point the covered pin hole to an object. Hold the camera tight. Moving cameras will produce blurry images.
- When the camera is secured, open the shutter for 10-15 seconds. 10 if it is bright and sunny and 15 if it is indoors.
- Close the shutter securely. Put your thumb over the shutter tight. Any extra light will ruin your picture.

Part 4: Developing Film (50 pts)

- Developing film must also happen in a dark room. Go to the dark room. Be careful not to bump anyone coming in and out of the room.
- Put your exposed photographic paper into a tray of paper developer. Be sure you completely cover the paper with the developing chemical. Agitate it by gently rocking the tray back and forth. You need to develop the paper for at least 1 minute.
- Next, put the paper into another tray with water to stop the development.
- Next, put the paper into a tray of fixer. Be sure you completely cover the paper with the fixer. Agitate it by gently rocking the tray back and forth. You need to fix the paper for at least 4 minutes.
- Next, put the paper into one last tray with water.
- Put the picture somewhere to dry. Be sure that you don't touch it until it completely dries, because it will be tacky while it's drying and if you touch it, it will leave marks.
- You must take at least 3 good images using your homemade camera. These images will be turned in for your photo collage project. Take as many as you can in the time that we have the best 3 will be graded.
- Make sure your name is on the back of ALL of your photographs.

Part 5: Photo collage (50 pts)

- Choose your best three images from the field trip. Make sure your name and period is on the back of each of them. Number them 1, 2, and 3 on the back.
- Create a folder called “Pinhole images.” Take a digital image of your best 3 images and take an image of your camera. Upload them to that folder.
- Open up Microsoft Word. Write a description (3 or more sentences) of how each picture was taken and what can be seen. Use the format below:



- Print out the document and give it to your teacher.

Part 6: Reporting (50 pts)

- You must produce a Prezi presentation that details the process of camera construction, picture taking, and picture development.
- Go to: https://prezi.com/
- Click on Get Started
- Click on Continue Free
- Fill out the information for your email put in yournamefirstandlast@noemail.com
- Next create a Prezi presentation that has the following information.

Slide 1: Title: Pin Hole Cameras include your first name ONLY
Slide 2: Explain what a Pin Hole Camera is and how you constructed it. Include an image of your pin hole camera.
Slide 3: Explain what the dark room is, why is it used, and the process of developing the image. (Do a google search and add images of a dark room similar to the one you used).You can use more than one slide if you want.
Slide 4: Show one image that you took with your camera
Slide 5: Show one image that you took with your camera
Slide 6: Show one image that you took with your camera
Slide 7: Answer the following question with 3 or more complete sentences: What did you learn from this project?

Camera Project Student: _____

Date: _____ Period: _____

Student Lab Report Self Grading Sheet

This grading rubric should be completed by your team and handed in with the collage and camera. Circle the point value (in pencil) for each section that you feel best represents your project. Score yourself fairly. Matching the instructor's score will earn your group an extra point, while over-scoring by four points will result in a one point reduction.

Total Scoring:

Your Total Score	***Instructor's Score***
	

Sectional Scoring:

Camera report (10 pts.)

0 1 2 3 4 5 6 7 8 9 10

- Is the report orderly, neat, and concise?
- Is the information presented in each section organized and easy to follow?
- Was the complete process of building the camera, taking pictures, and developing the pictures described in one typed page or less?

Camera (10 pts.)

0 1 2 3 4 5 6 7 8 9 10

- Is the camera well constructed?
- Is the camera durable (can it be used again)?
- Is the camera light-tight (any random bright spots on the developed pictures)?
- Were the instructions followed correctly?

Picture Collage (20 pts.)

0 2 4 6 8 10 12 14 16 18 20

- Are there 4 pictures that are clear and with contrast?
- Are the pictures developed properly?
- Does each picture have a description of how it was taken and what can be seen?
- Is the Collage well presented and pleasing to the eye?

Pinhole Camera Name:_____
Date: _____ Period:____

Pinhole Camera: Rubrics

1. Who was your partner? _____

2. Complete the following grade sheet for your **PARTNER** using a 1-10 scale *(1 being the worst 10 is the best)*

Category	**Score: 1-10**
Timeliness (Appointments /meeting times were kept)	
Building / Construction of project	
Creative input	
Picture Taking and Developing	
Report Writing	
Overall effort on project	
Total Score	

3. Complete the following grade sheet for **YOURSELF** using a 1-10 scale *(1 being the worst 10 is the best)*

Category	**Score: 1-10**
Timeliness (Appointments /meeting times were kept)	
Building / Construction of project	
Creative input	
Picture Taking and Developing	
Report Writing	
Overall effort on project	
Total Score	

4. Comments for you instructor about your partner's effort.

5. Anything else?