INTR 3B05

Professor Pam Patterson

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Pinhole Camera Lesson Plan

Art is a very vast and varying subject. There are so many different ways to think about and approach the art world. With so many mediums available, it is important to try and introduce as many as possible to students in a simple and informative way without it becoming too complicated or overwhelming. This lesson plan will cover the basics of photography. Included, will be a small project that will enable to the students to engage in their work and apply their new knowledge to a practice.

Students will learn about the basic principles of photography and then proceed to create a simple pinhole camera. For the lesson and discussion it would be advisable to have a manual film camera and digital SLR to refer to as well as a large-scale pinhole camera for the students to see and touch. Along with this, a diagram of each camera with parts labeled to use as an instructional guide when describing the working mechanics. (See last two pages) Lastly, for the project, students will each need:

- A black film canister
- Electrical tape
- A push pin

- Sandpaper
- Light sensitive paper or film
- A dark bag or dark room is also helpful, but these can be improvised if needed.

This lesson plan has been developed for a grade 11 or 12 art/photography class but can be adapted for grade nine or ten as well. The intention is to introduce students to the fundamentals of film photography while facilitating a simple and effective hands-on experiment. Students will explore the main principles and technology of film photography by constructing and then using a simple pinhole camera. Ideally, the lesson will span over two or three classes due to the construction and use of the pinhole camera.

Students will focus on a theme that is relative to their school, culture or community when capturing images with their cameras. Perhaps they could take images of the school, surroundings, or each other. Having the students focus on a specific concept will allow them to narrow their ideas and give guidelines for the project. Incorporating an event in the community that is going on at the time of the lesson is a great way to give the lesson some practicality. The theme can and will vary depending on the school, students and the community.

This lesson not only addresses a medium of art that many students have not experienced, but it enables the students to explore their creativity in a new way. Manual and pinhole photography are becoming things of the past and yet still hold critical learning concepts for any student of art or photography. It is important to

understand the history of cameras and photographs to be able to successfully apply the concepts to any sort of digital output.

Below, each lesson will be outlined, splitting the project into two classes. The first class will focus on current photography, equipment, and software in order to bring up concepts that are relatable for students. These are also ideas that can be tied to film photography and historical processes. The discussion will then switch to manual photography and the technology that was first used to create images. Students will compare digital to manual and begin to make connections between the two technologies.

Lesson 1:

First, the students will engage in a discussion about photography now. Questions about current photography should be raised.

Q: What kind of cameras do you use?

Q: What is popular and why? What is easy to use?

Q: If you use primarily digital cameras, why do you think that is? Is it a preference over film? Or is all that you know?

Q: What programs assist this process, if any?

This discussion will most likely revolve around the concept of digital photography, Photoshop, Lightroom etc. From here, a discussion will be facilitated on the basic principles of photography in general.

Q: What makes an image?

Q: How does a camera capture and freeze a moment in time?

Q: What are the key parts of a camera?

A: Discussion on how students *think* an image is created.

Here, an image of the internal workings of an SLR film camera will be handed out and labeled. This discussion will lead into a brief history of photography, the camera, and how photography was first used.* Basic knowledge will be discussed, and a film camera will be used to demonstrate the technology.

The discussion will switch from the modern DSLR to the principles of a pinhole camera. A pinhole camera diagram will be handed out and labeled. Essentially, the pinhole diagram will have far fewer labels than the SLR.

Q: How do the principles of photography now relate to the principles of a pinhole camera?

A: Discussion will present itself. Draw similarities between the SLR and pinhole, but more questions will come up, as listed below.

Q: Where is the lens?

A: The lens is the pinhole itself.

Q: How can an image be captured without a glass lens?

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* Teachers can refer to the references listed at the end, for some extra knowledge on the history of photography. Photography: A cultural history by Mary Warner Marien is a really informative text.

A: The pinhole acts as a lens. When the light of the sun hits an object, that objects absorbs and reflects some of the light. When you place a pinhole camera in front of an object, the light from that object travels into the pinhole and then is reversed and flipped upside down, projecting on the back wall of the camera. That is where you would place a piece of light sensitive paper. The smaller the pinhole, the sharper the image will be (within reason). The pinhole focuses every point of light that is reflected off the object, the bigger your pinhole, the blurrier your image will be.

Q: How can the simple pinhole create an image?

A: The technology on a new camera is exactly the same. The actual lens is only used to create a larger 'pin hole' so that the film can be exposed faster. This allows us to hold the camera and not have to use a tripod for every image.

At the end of the discussion the students will each be given a black film canister, a small piece of sand paper, a strip of electrical tape and a push-pin. The construction of the camera will be explained and each student can make their own (or in pairs if preferred.) The construction is fairly simple.

Making a Film Canister Pin Hole Camera

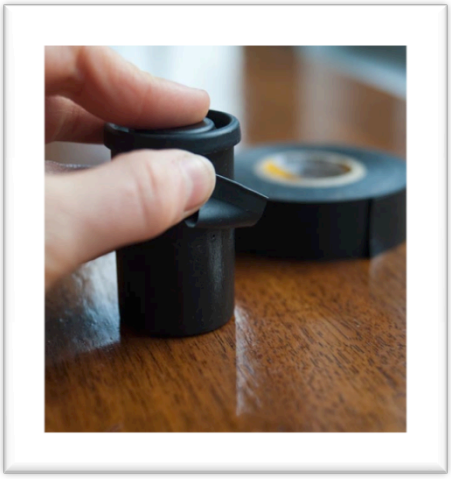
Students will require:

- A Black film canister
- A push pin
- Black electrical tape
- Fine sand paper

1. Uncap the film canister

2. Take a push pin and insert it into the film canister in the middle of one side.

3. Remove pin and sand the pinhole so that any small pieces of plastic are removed. This is the 'lens' of the camera so any small bits of plastic or dust will show up in the image.



4. Next cover the pinhole with some electrical tape. This is the 'shutter.' Make sure you are able to lift up the tape easily when you want to expose for an image. You might want to fold over the bottom or side of the tape to create a flap for easy use.

Lesson 2:

In this part of the lesson, students will put their knowledge into practice. Using the pinhole cameras as tools for creating images, students will take pictures that surround a certain theme or idea, as decided by the teacher. Students will have to experiment with exposure times depending on the conditions during that day.

Use of a pinhole camera is very simple. The canister is placed on a solid surface pointing at the scene or object. The electrical tape 'shutter' is lifted for the appropriate amount of time; 'the shutter speed'. The tape is then secured back down and the film or paper is taken to be developed. Usually the shutter speed for a camera like this will be between two and four seconds, but it can change depending on the size of the camera and the conditions of the day. There are many resources that can be used to aid in this process, but it is best to first participate in some trial and error. Students will expose a single image at a time, or can experiment with multiple exposures if they feel so inclined. They will also have to develop each image in order to see what changes need to be made.

This lesson can be adapted depending on the class. If it is a photography class, then perhaps the students can develop each image themselves, if not, then the teacher can facilitate this separately. The lesson encourages trial and error. If a final product is not produced, the students are encouraged to continue, but some substantial effort is what is important. They are encouraged to do some more research on the topic and, perhaps, make a larger or more sophisticated pinhole camera using any materials they see fit.

When the paper or film is loaded or removed from the canister, it must be done in a dark bag or dark room. A dark room is preferred, as the paper can be taken straight from the canister and put into developer.

This lesson embraces the idea of learning through holistic education. While the lesson concept emphasizes practical knowledge and concepts, the project enforces experience and application. It is a very experimental process and the students may not catch on right away, but hopefully it can open their eyes to a new way of thinking about art and specifically photography.

References:

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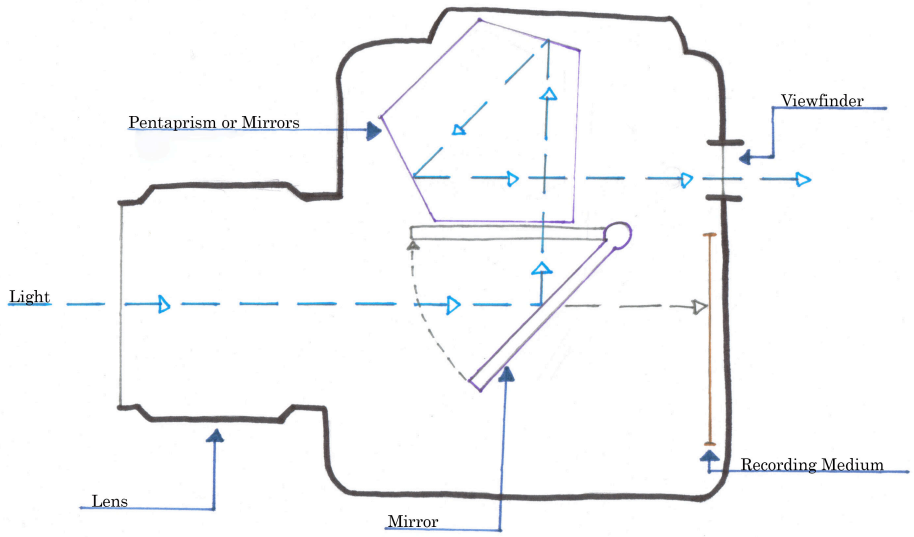
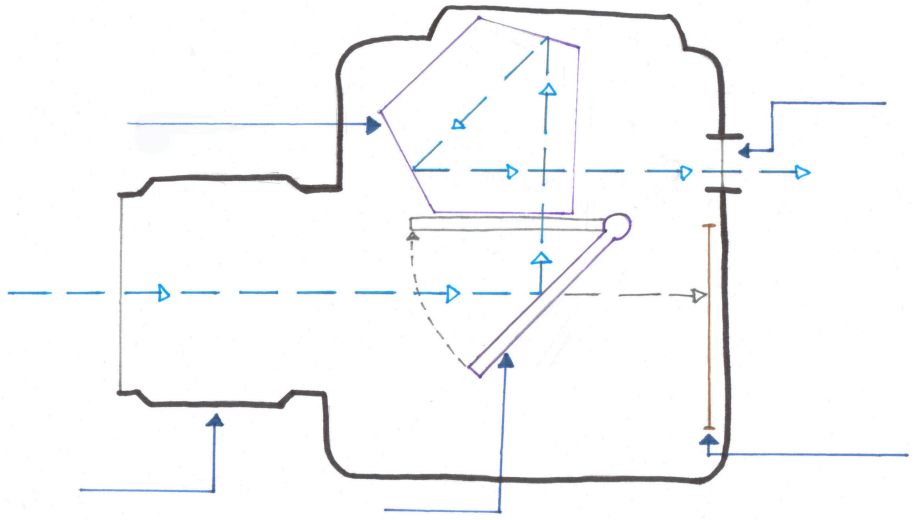
SLR Camera



*Lines in grey indicate what occurs when the shutter is pressed.

SLR Camera



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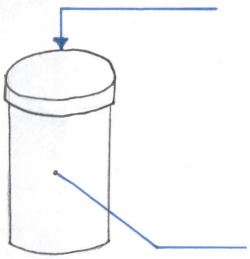
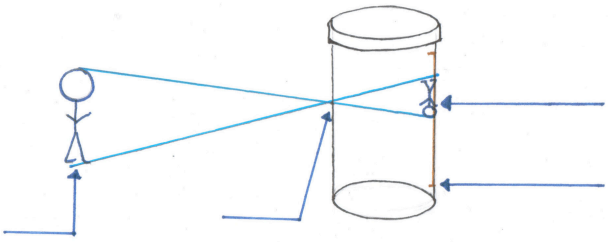
Pinhole Camera





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