

STEAM Subject: Photography

Lab: Light and Shadow

Grades: 4th-8th

Learning objective:

Students will photograph a subject or object under different light conditions.
Students will describe how light interacts with different subjects or objects at different times of the day.

ENGAGE:

Ask students the following questions:

- What is the meaning of the Greek word “photography”? *Drawing with light*
- What is the key element to create a photograph? *Light*
- What happens when we put an object in direct contact with the light? Are there any changes during a sunny day and a cloudy day?

EXPLORE:

Activity: Photography in different light conditions.



7:30 am



12:00 pm



5:50 pm



6:10 pm

Photos by EIS Photography Instructor Carla Reyes

Materials:

- Any type of camera
- Objects or living creatures to photograph

Directions:

1. Choose one subject or object (i.e. person, pet, or your favorite toy) to photograph.
2. Pick a few places where the light *changes throughout the day*.

3. Take a picture of the same subject (or object) during different times of the day on the same spot.
4. If possible, you also take pictures of your object outside in the same spot where the object (or subject) is exposed to light changes throughout the day.
5. Close your eyes and think about the subject you are going to photograph and, in a journal, or notebook write:
 - a. Three words that describe physical characteristics of your subject. For example, if you pick a person you can describe their hair, smile, height, or other characteristics.
 - b. Three words or one phrase that describe what you like the most and why. You can write about the person's laugh or favorite play times with the toy.
 - c. Three words that expresses your emotions about the subject or object (e.g. happy, love, uncertainty, anger, tranquility, intrigue, etc.).
6. Photograph your subject under at least 3 different interesting light conditions (morning, afternoon and sunset).
7. Now let's get you ready to take a photograph! Follow the following tips:
 - Review and reflect about your answers and if possible try to include them.
 - Observe how the sun exposure interact with your object. How the light or shadow changes the appearance of the object?
 - Play with the shadows and add shapes to your images.
 - Take your first photo with the first **composition** that you like. Continue taking photos moving your subject around to get different viewpoints, moving your camera up and down, getting closer and farther.

EXPLAIN:

The intensity of the light changes throughout the day and can be used to create shapes, and emphasize physical and/or emotional characteristics.

In the morning, evening, and/or during cloudy or overcast days the sun is not as "direct". The light diffuses in the sky and comes in different directions. When your subjects are evenly illuminated it can create a peaceful feeling.

When more light is available like around noon, the shadows appear darker and creates shapes. The shadows moves as the sun moves and are less or more visible depending on the location of the sun. Shadows can create very interesting shapes and dramatic and/or mysterious photographs.

Photographers have the fortune to take photographs at different times of the day and light is a source of inspiration. Sometimes, they have to move around to photograph a subject from a more interesting angle-where the light and shadows creates shapes and/or illuminates just part of the subject.

Photography Tip-when something caught your attention and you want to photograph it, pay attention to how the light illuminates your subject, move around, get inspired, and click!

Review STEAM Vocabulary

Photography- Photography is the art, application and practice of creating durable images by recording light or other electromagnetic radiation.

Composition- is the manner in which elements are positioned within a photo, it allows the photographer to guide the viewer's eye across the image towards the main subject.

Light- is electromagnetic radiation with specific frequency. Electromagnetic waves can be detected over a wide range of frequencies, of which the visible spectrum of colors detectable by human eyes is just a small part. Light is a particle and a wave. When light waves enter a piece of glass (like a camera lens) at an angle, one part of the wave will reach the glass before another allowing an image to be capture.

Shadow- a dark image produced when an object blocks rays of light from reaching a surface.

ELABORATE:

Review some inspiring photographs and tips from National Geographic:

- <https://www.nationalgeographic.com/photography/photo-tips/digital-photography-tips/#close>
- <https://www.nationalgeographic.com/photography/photo-tips/color-palette-simple-beautiful-photos/>
- <https://api.nationalgeographic.com/distribution/public/amp/photography/photo-tips/light-tips-simple-beautiful-photos>

What is **Light**? Get your **Physics** knowledge on with the following resources!

- Watch a Bozeman Science video about Electromagnetic radiation
<https://youtu.be/dzyPT7kxp8M>
- Read <https://phys.org/news/2015-03-particle.html>
- Watch and discuss these videos to learn more about the science of light.
<https://youtu.be/mlaVHxUSiNk>
<https://www.sciencedaily.com/releases/2011/04/110424152458.htm>

EVALUATE:

Evaluate your photographs and choose one that you like the most.

Answer the following questions:

1. How was the weather? Was it sunny, cloudy, or rainy?
2. What time of the day you got bright areas and strong shadows?

3. What time of the day light has more soft colors?

Then go back to your journal or notebook and answer the following questions:

1. Do you think the photo you chose describes your feelings?
2. If not, which one do you think it describes it best?
3. Do you think you can try to represent a feeling by using different types of natural light?

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