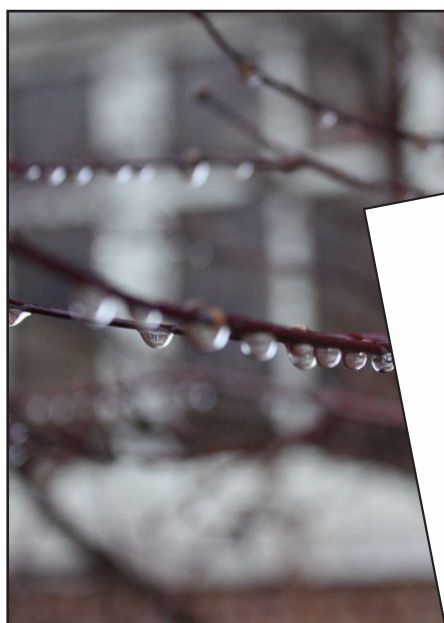


# INTRO TO DIGITAL PHOTOGRAPHY

## HOW TO USE THE APERTURE



**Introduction to DSLR Photography**  
Aperture, F-Stop, & Depth of Field

**BIG IDEA:**

- Aperture, F-stop, and depth of field.

**ESSENTIAL QUESTIONS:**

- How does the aperture impact the depth of field?
- What is the relationship between the aperture and f-number?
- What impact did the 3 different apertures have on your photographs of the same object?

**OBJECTIVES:** Students will...

- Look at and discuss the history of photography and the use of the aperture.
- Take 3 photos of the same object using 3 different aperture settings.
- Learn about basic Photoshop editing techniques and apply that to their photographs.
- Post or digitally submit photographs for grading.
- Participate in a critique of the photographs.

**STANDARDS:** <http://www.nctanetstandards.org>

- ART:
  - 6<sup>th</sup> grade:
    - Visual Arts-Creating: VACv2.1.6, Demonstrate expression in art and design.
    - Visual Arts-Responding: VArRv3.1.6, Develop and apply relevant criteria to evaluate a work of art.
  - 7<sup>th</sup> grade:
    - Visual Arts-Creating: VACv1.2.7, Develop artistic to guide making a work of art or design to reach an identified goal.
    - Visual Arts-Creating: VACv1.2.7, Demonstrate persistence in developing works of art or design.
    - Visual Arts-Responding: VArRv1.1.7, Compare and explain differences between an evaluation of an artwork based on a personal criteria and an evaluation of an artwork based on a established criteria.

**APERTURE CRITIQUE**

1. Fill out the critique sheet. The group has a chance to carefully look at and reflect on the photographs before you start making changes.

2. Cut out the aperture shapes.

3. At each photography display, label the photograph you think used the largest aperture (smallest f-number), middle aperture, and smallest aperture (and largest f-number).

4. Use if your photographs were correctly labeled by your peers.

5. Participate in a verbal discussion about the photographs and use of apertures.

**APERTURE**

largest ↑

f2.8

f4

f5.6

f8

f11

f16

smallest ↓

**DEPTH OF FIELD**

A diagram illustrating the relationship between aperture size and f-number. It shows a vertical axis labeled 'APERTURE' with an upward arrow indicating 'largest' and a downward arrow indicating 'smallest'. Along this axis are several circular aperture shapes of decreasing size from top to bottom, corresponding to f-numbers: f2.8, f4, f5.6, f8, f11, and f16. To the right of the diagram is a vertical strip labeled 'DEPTH OF FIELD' with an upward arrow indicating 'largest' and a downward arrow indicating 'smallest'. This strip contains a series of small photographs of a landscape, showing how the depth of field changes as the aperture is adjusted.

DSLR, USING THE APERTURE:  
LESSON PLAN, PRESENTATION,  
ACTIVITY, RUBRIC, & MORE

# Introduction to DSLR Photography

## Aperture, F-Stop, & Depth of Field

### BIG IDEA:

- Aperture, f-stop, and depth of field.

### ESSENTIAL QUESTIONS:

- How does the aperture impact the depth of field?
- What is the relationship between the aperture and f-number?
- What impact did the 5 different apertures have on your photograph object?

### OBJECTIVES: Students will...

- Look at and discuss the history of photography and the use of the lens.
- Take 5 pictures of the same object using 5 different aperture settings.
- Learn about basic Photoshop editing techniques and apply that to photographs.
- Print or digitally submit photographs for grading.
- Participate in a critique of the photographs.

STANDARDS: <http://www.nationalartsstandards.org/>  
Middle School:

- Visual Arts/Creating: VA:Cr2.1.8, Demonstrate with experiment, innovate, and take risks to pursue ideas and meanings that emerge in the process of art-making.
- Visual Arts/Responding: VA:Re9.1.8, Create a logical argument to support an evaluation of art.

### High School:

- ART:
  - Proficient:
    - Visual Arts/Creating: VA:Cr1.1.HSI, Use multiple media to begin creative endeavors.
    - Visual Arts/Responding: VA:Re8.1.HSI, Interpret and evaluate a collection of works, supported by relevant and sufficient evidence found in the work and its various contexts.
    - Visual Arts/Presenting: VA:Pr.4.1.HSI, Analyze, curate artifacts and/or artworks for presentation and preservation.
    - Visual Arts/Responding: VA:Re9.1.HSI, Establish relevant criteria in order to evaluate a work of art.

- Aperture and Depth of Field poster

### RESOURCES:

- [https://en.wikipedia.org/wiki/History\\_of\\_the\\_camera](https://en.wikipedia.org/wiki/History_of_the_camera)
- <https://helpx.adobe.com/photoshop/how-to/ps-basics-fundamentals.html>
- [https://en.wikipedia.org/wiki/Digital\\_single-lens\\_reflex\\_camera#History](https://en.wikipedia.org/wiki/Digital_single-lens_reflex_camera#History)

### VOCABULARY:

- Elements of photography: Successful photos rely on order, and the main elements that bring and emphasize order in a photograph's composition are: line, color, shape, contrast, emphasis, texture, and space.
- Line: Used in photographs to move your eye around the image, lead your eye to the focal point, create texture, pattern, and emphasis.
- Color: Used in photographs to create emphasis, variety, and interest.
- Shape: Used in photographs to create pattern, repetition, unity, and variety. Distinguishing shapes are shapes that are isolated and as a result, emphasized. Repetition of shapes creates repetition and a sense of unity in the photograph.

- Rules of composition: Guiding principles to help create successful photographs. Includes the rule of thirds, balancing elements, leading lines, viewpoint, inclusion and exclusion.
- Rules of thirds: Placing the focal point of the photograph in one of the third sections rather than directly in the center.
- Balancing elements: When taking photographs you must consider the weight of objects. If something feels too heavy, try balancing it with another object. Formal balance, or including a symmetrical composition, and informal balance, or including an asymmetrical composition, are also part of the balance of the photograph.
- Leading lines: Strategically including lines in the photograph that direct your eyes around the composition.
- Viewpoint: The angle at which the photograph is taken, taking into consideration the best way to portray the subject matter.
- Inclusion and exclusion: Determining what are and aren't important parts of the photograph either through repositioning and reshooting or cropping the image.
- Mergers: Background objects that compete with the main subject matter and confuse the focal point.
- Focal Point: the center of interest or activity.
- Aperture: A part of a lens that controls the amount of light that enters the camera and as a result, the depth of field.
- F-stop/f-number: a camera setting corresponding to a particular f-number, which is determined by the ratio of focal length to the aperture diameter. The f-number represents the aperture setting.
- Depth of field: the distance between the nearest and the furthest objects that give an image judged to be in focus in a camera.

IMPLEMENTATION: For a 50 minute class, times may vary.

### DAY 1: Introduction

- Start class by showing the Intro to DSLR and Aperture presentation.
- Encourage students to participate in a class discussion as you go through the slides. Tell them they need to take notes, particularly during the aperture section.
  - Discuss the history of photography, take questions as they come up.
  - Talk about the first "permanent" photograph. Compare it to modern photography.

- Explain what an aperture is and what it does, point to the photograph and the lenses with the different aperture settings.
- Explain that they may hear the word f-number and f-stop in conjunction with aperture.
- Show the aperture and depth of field diagrams, take questions as they come up.
- Look closely at the depth of field diagram, ask students for examples when they would use a shallow vs. deep depth of field.
- Explain their assignment and look at examples of labeling the photograph with the f-number. Take questions as they come up.
- Go through the basics of uploading their pictures and figuring out the number of the picture.
- Explain that they will have time in class today and tomorrow to take pictures, upload, and edit them.
- They need to allow enough time to upload the pictures they take today to their computers.
- Pass out their assignment sheet, cameras, and other supplies and send them to start photographing.
- Remind them to behave themselves while they are outside of the classroom. Before this assignment contact your administrators for approval and notify other faculty members that students will be working outside of the classroom reported.
- Students have the remainder of class to take pictures.
- Before class ends, students need to report back to the classroom in time to get equipment, upload pictures, and pack up to leave.

### DAY 2: Take and Edit Aperture Pictures

- At the beginning of class pass out the Photoshop Basics worksheet.
- If possible, screen cast your computer as you go through the worksheet and out where tools are located and how to use them.
  - Warn students to not push their pictures too far. They should not let them have filters applied to them. They should have a nice balance of color, contrast, highlights, and shadows.
  - Take questions as they come up.
- After the Photoshop tutorial, hand out supplies and let the students continue photograph using different apertures.
  - Remind them to set their cameras to Av/A mode.
- Remind the students they must behave themselves, or their grades will suffer.
- Once they are finished taking their pictures they need to come back, upload images, and start editing.
- Float and help students one on one.
- They should aim to have their pictures labeled and edited by the end of class.
- Submission options will vary. Select the one that makes the most sense for your class. For this assignment, ideally, have students print their pictures.

- In order to submit their photographs they need to pick their final 5 pictures and pick the following:
  - If printing: Have students print their final photographs on photo paper. Walk them through the process of selecting the correct printer, sizing their image to their photo paper, and printing. Once they are printed, they need to mount them on poster board for the critique and submission.
  - If digitally submitting: Rename the pictures with the aperture f-number, and save all their pictures in a folder titled Your Name-Aperture. For the critique, have the students pull their photographs up on the computer.
- The last five minutes of class allow students to clean up.

### DAY 3: Finish Editing, Critique, and Submit

- Have students wrap up editing and preparing their photographs for printing or digital submission.
- Halfway through class have students put up their photographs for a critique.
- Pass out the critique worksheet, explain the process:
  - They will fill out a worksheet to help guide them through looking at the artwork.
  - They will label each photograph with what they think is the highest, lowest, and middle aperture setting.
  - Once the students are finished, start a verbal critique. Ask if anyone's photographs were labeled correctly. Discuss which photograph out of the groupings is the most interesting and uses the most successful aperture setting.
- At the end of the critique have the students turn in their critique sheets for a participation grade and their aperture photographs for a project grade.

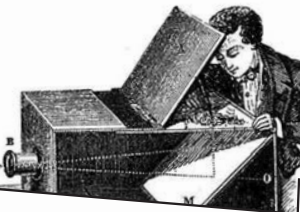
# LESSON PLAN:

BIG IDEA, ESSENTIAL QUESTIONS, US NATIONAL STANDARDS, STEP-BY-STEP INSTRUCTIONS

# THE BASICS OF A DSLR CAMERA

## A little bit of history...

- The first "camera" didn't capture permanent images, it was used as a tool to trace.



## A little bit of history...



- Forms of camera were developed over years.
- Lenses, shutters, and

## A little bit of history...



- The first partially captured photographic image was made around 1816 by Nicéphore Niépce, using a camera he constructed and paper coated with silver chloride, a forerunner to film and photo paper.
- Because Niépce didn't know how to remove the image, he had to turn the camera upside down and

## A little bit of history...

- Niepce continued to experiment with creating photographs and eventually was successful in capturing a permanent image, which is still



## A little bit of history...

- Cameras continued to develop over the years. The birth of film photography came in 1885 thanks to George Eastman. His first camera was called "Kodak."

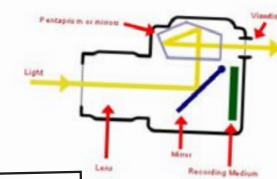


## A little bit of history...

- The creation of 35mm film was the next big jump in the development of photography. This allowed cameras to be smaller and more portable.
- The single-lens reflex (SLR) camera was developed next, and uses a semi-automatic moving mirror system which permits the photographer to sometimes see exactly what will be captured by the film or digital imaging system, as set by the film or digital



## How an SLR Works:



- SLR cameras have a mirror and pentaprism to let you use the lens for composing and focusing.
- The reflection in the mirror allows you to see what the camera is going to capture through the viewfinder, even though the viewfinder is placed higher than the lens.
- SLR cameras are easy to focus.
- The meter inside camera is designed to measure light coming through the lens.

## A little bit of history...

- The first digital camera was invented in 1975 by Kodak engineer, Steve Sasson.
- Although digital cameras were around in the 70's, they weren't widely available to the public until the mid 90's as they became smaller and more affordable.
- By the early 2000's digital cameras and have



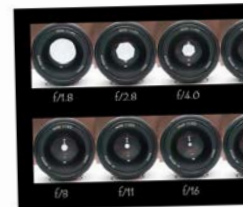
## HOW A DSLR WORKS



## How a DSLR Works:

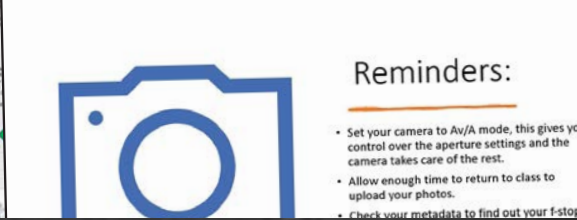
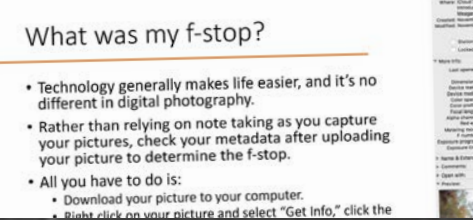
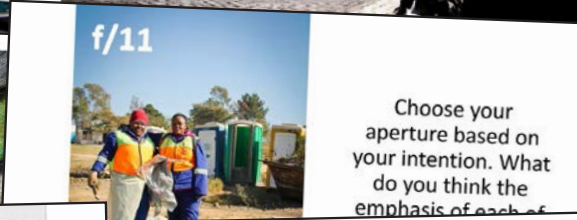
- A digital single-lens reflex camera (DSLR) is a digital camera that uses a mechanical mirror system and pentaprism to direct light from the lens to an optical viewfinder on the back of the camera. Same as an SLR camera.
- BUT digital technology is used to capture the image rather than film.
- A light-sensitive chip is used instead of film.

## Learning to Use a DSLR:



## Aperture and F Stop

- The lens aperture is specified as an f-number, which is the ratio of focal length to the aperture diameter.
- Most lenses have a set of marked f-stops, that the f number and aperture, can be set to.
- A lower f number means a larger aperture opening, which allows more light to enter the camera.
- The photography term, one f-stop, refers to an



# PRESENTATION: PROJECT EXAMPLES, REQUIREMENTS, & GRADING DETAILS

## APERTURE ACTIVITY

The aperture lets in light and affects depth of field. Low numbers (f/2.8) create shallow depth of field, high numbers (f/22) create great depth of field. Your job today is to get a range of depth of field at least 5 different apertures on one object. Choose an interesting object and photograph the same using 5 different apertures.

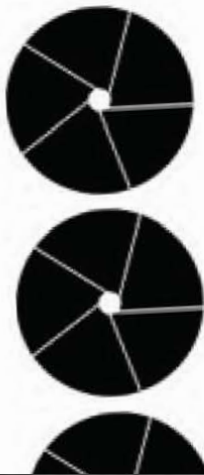
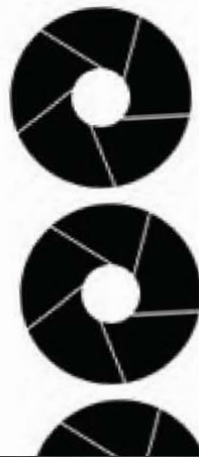
- 1) Put the camera in Av/A mode (Aperture Priority, all you have to do is change the aperture)
- 2) Auto WB/ISO.
- 3) You must come back 10-15 minutes before class to have time to upload today.
- 4) Upload and edit your photos.
- 5) Label your photos with the correct aperture (using a decimal).

## APERTURE ACTIVITY

The aperture lets in light and affects depth of field.

## APERTURE CRITIQUE

1. Fill out the critique sheet. This gives you a chance to carefully look at and reflect on the photographs before you start labeling them.
2. Cut out the aperture shapes.
3. At each photography display, label the photograph you think used the largest aperture (and smallest f-number), middle aperture, and smallest aperture (and largest f-number).
4. See if your photographs were correctly labeled by your peers.
5. Participate in a verbal discussion about the photographs and use of aperture.



Name: \_\_\_\_\_

## APERTURE CRITIQUE

Carefully look at each work of art. Pay attention to subject matter, focal point, composition, and the elements of photography, and the use of aperture. Then answer the following questions:

1. Which photograph collection caught your attention first? Why?

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2. Which photograph best uses the aperture? Why?

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## APERTURE ACTIVITY RUBRIC

Aperture 1 (10): \_\_\_\_\_

Aperture 2 (10): \_\_\_\_\_

Aperture 3 (10): \_\_\_\_\_

Aperture 4 (10): \_\_\_\_\_

Aperture 5 (10): \_\_\_\_\_

The photographs are correctly labeled with the aperture used: \_\_\_\_\_

The same object is shown in all 5 photographs: \_\_\_\_\_

Total (out of 50): \_\_\_\_\_

## APERTURE ACTIVITY RUBRIC

Aperture 1 (10): \_\_\_\_\_

Aperture 2 (10): \_\_\_\_\_

Aperture 3 (10): \_\_\_\_\_

Aperture 4 (10): \_\_\_\_\_

Aperture 5 (10): \_\_\_\_\_

The photographs are correctly labeled with the aperture used: \_\_\_\_\_

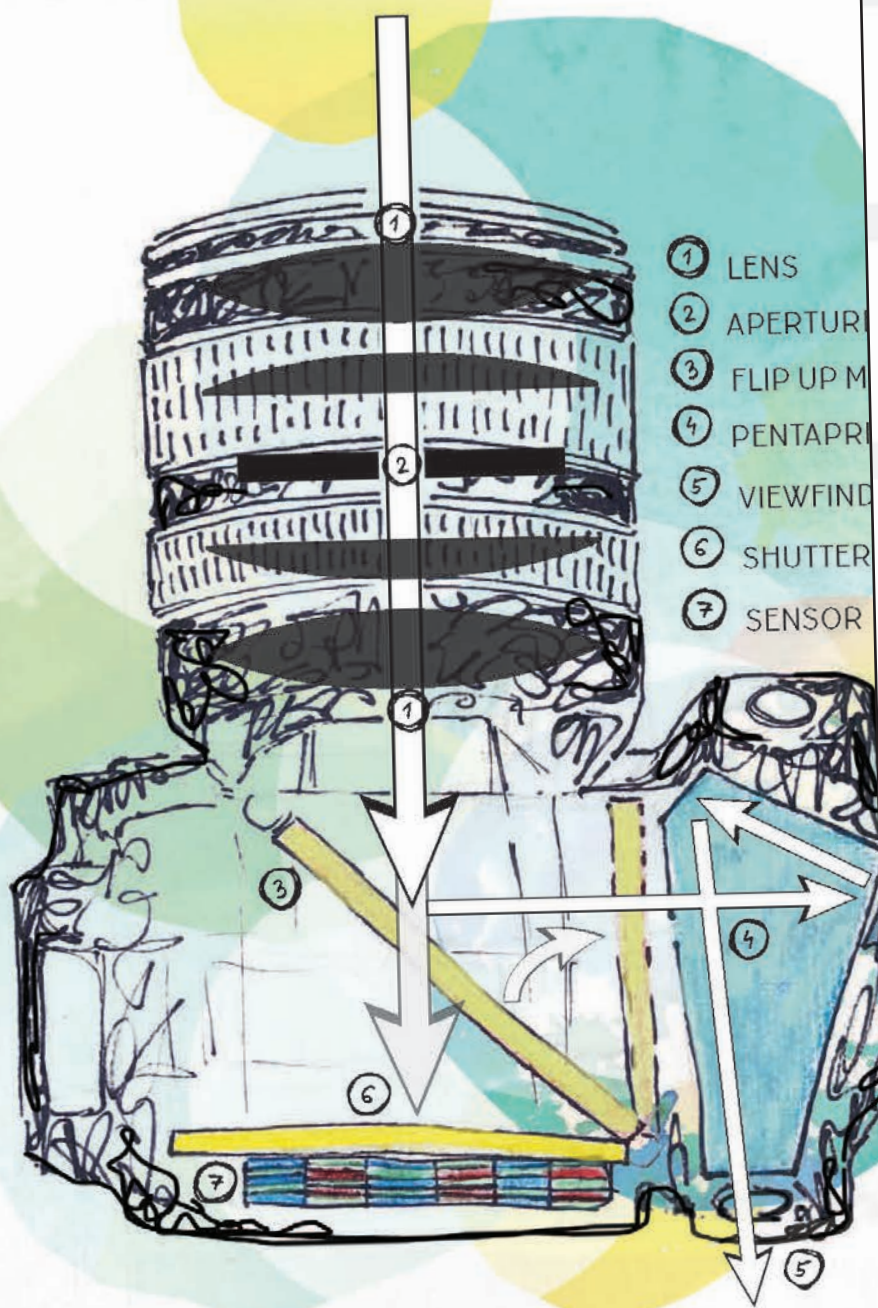
The same object is shown in all 5 photographs: \_\_\_\_\_

Total (out of 50): \_\_\_\_\_

# HANDOUTS:

## PROJECT HANDOUT, RUBRIC, CRITIQUE

# HOW A DSLR WORKS



## APERTURE

smallest

largest



f2.8



f4



f5.6



f8



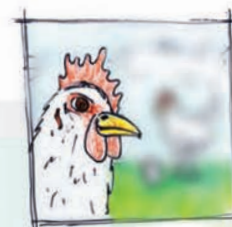
f11



f16



f22



shallowest

DEPTH OF FIELD

deepest

# PRINTABLES

## HANDOUT & POSTER SIZES