

Mastering Manual Mode, Part 2: All About That Glass

Camera Operations

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Grade Level	9th – 12th Grade	**Time Frame**	240
Subject	Visual Arts	**Duration**	4-5
Course	Visual Arts		

Essential Question

What is the main focus element of an image?

Summary

In this lesson, students will explore how different types of camera lenses--prime, zoom, wide, and telephoto--affect the appearance and composition of a photograph. By comparing photos taken with various lenses, they will observe differences in focal length, depth of field, and bokeh. The lesson will also cover how features like f-stop range, zoom capabilities, and filter diameter impact both image results and lens pricing. Students will engage in hands-on analysis of images and physical lens characteristics through two interactive activities. By the end of the lesson, students will be able to evaluate and choose lenses that match their creative style, technical needs, and shooting conditions.

Snapshot

Engage

Students engage with key vocabulary words using the Frayer Model.

Explore

Students compare/contrast similarities and differences of different types of lenses using a Venn Diagram.

Explain

Students analyze photos in a poster Gallery Walk.

Extend

Students determine the best use of a set budget to purchase the best camera lenses for a particular scenario.

Evaluate

Students reflect on their learning and complete a 3-2-1.

Standards

ISTE Standards for Students (For Students (2016))

ISTE1: Empowered Learner- Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
ISTE1a: Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
ISTE1b: Students build networks and customize their learning environments in ways that support the learning process.
ISTE1c: Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
ISTE1d: Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

Oklahoma Academic Standards (Fine Arts: Visual Art (High School: Proficient (I)))

VA.CP.1 : Learn and use vocabulary and concepts related to visual arts.
I.VA.CP.1.1 : Use the elements of art (e.g., line, color, form, shape, texture, value, and space) and principles of design (e.g., rhythm, balance, contrast, movement, center of interest, and repetition) to develop multiple approaches to create art.
I.VA.CP.1.2 : Shape a personal artistic vision using a contemporary practice of art and design.
VA.P.2 : Use various media, supplies, and tools in an appropriate and safe manner in the creation of original visual artworks.
I.VA.P.2.1 : Explain how traditional and non-traditional materials used in art- making may impact human health and the environment. Demonstrate safe handling of materials, tools, and equipment.

Attachments

- 3-2-1 - Spanish.docx
- 3-2-1 - Spanish.pdf
- 3-2-1 .docx
- 3-2-1 .pdf
- Equipment Cost Sheet - Spanish.docx
- Equipment Cost Sheet - Spanish.pdf
- Equipment Cost Sheet.docx
- Equipment Cost Sheet.pdf
- Frayer Model - Spanish.docx
- Frayer Model - Spanish.pdf
- Frayer Model.docx
- Frayer Model.pdf
- Gallery Walk Posters.docx
- Gallery Walk Posters.pdf
- Gallery Walk Response Sheet - Spanish.docx
- Gallery Walk Response Sheet - Spanish.pdf
- Gallery Walk Response Sheet.docx
- Gallery Walk Response Sheet.pdf
- Lesson Slides .pptx
- Scenario Information Sheet - Spanish.docx
- Scenario Information Sheet - Spanish.pdf
- Scenario Information Sheet .pdf
- Scenario Information Sheet.docx
- Venn Diagram - Spanish.docx
- Venn Diagram - Spanish.pdf
- Venn Diagram Posters.docx

- Venn Diagram Posters.pdf
- Venn Diagram.docx
- Venn Diagram.pdf

Materials

- Lesson Slides (attached)
- Frayer Model handout (attached: one per student)
- Equipment Cost Sheet (attached; one per student)
- Gallery Walk Response Sheet (Attached; one per student)
- Scenario Information Sheet (attached; one per student)
- Venn Diagram (attached; one per student)
- Venn Diagram Posters (attached)
- Gallery Walk posters (attached)
- 3-2-1 handout (attached; one per student)
- Paper
- Pencil

10 minutes

Engage

Use the attached **Lesson Slides** to facilitate the following lesson. Begin the lesson by showing **slides 2-4**, which introduce the title of the lesson, the essential question, and the learning objectives.

Emphasize that the essential question will be addressed throughout the lesson.

Next, display **slide 5** and ask students to reflect on the similarities and differences between the two images on the screen. Ask, "What is unique about each?" Invite the students to think about their answers and then instruct students to "Turn to an Elbow Partner and discuss the differences between the two images. Talk about it for 2-3 minutes." After time is up, ask the following: "Now share what your *partner* noticed. Let's hear from a few of you."

Teacher's Note

Consider writing student observations on the board.

Teacher's Note

Curious about why each student will share their partner's ideas? Shifting the burden to someone else's ideas can help lower the affective filter for each student to participate.

40 minutes

Explore 1

Display **slide 6** and pass out copies of the Frayer Model document. Explain to students that "You're going to define three important photography terms that you'll use throughout the lesson, and throughout your time behind a camera. Each of these terms represents a visual concept, so thinking about how they look and feel is just as important as how they are defined." Use the content on **slides 7-10** to introduce the terms for the activity: focal length, depth of field, and bokeh.

Focal Length - How zoomed-in or zoomed-out does the image appear? This affects how close or far away the image feels from the viewer.

Depth of Field - Does the amount of the image that appear sharp or in focus from front to back.

Bokeh - How is the visual quality of the out-of-focus areas? Pay particular attention to how light sources are rendered in the background.

Student groups may consult with one another after they have completed the Frayer Model in their small group.

Transition to **slide 10.** After students have completed their Frayer model discussions, tell students that "Focal length and depth of field have a special relationship. The longer the focal length, the less depth of field the camera and lens will allow you to have. Have them view this video to learn more!

Embedded video

https://youtube.com/watch?v=3LHKK50G8ZQ

Teacher's Note

This diagram can be structured in two overlapping circles (e.g., Prime vs. Zoom) or expanded to a 4-part matrix depending on your students' comfort level. You might also consider showing side-by-side sample photos for each lens type to guide observations if physical lenses aren't available.

20 minutes

Explore 2

Display **slide 11** and say “Now that we’ve learned about focal length, depth of field, and bokeh, let’s take a closer look at different types of lenses and the kinds of images they produce. You’ll be comparing two kinds of lenses: wide and narrow. Use your observations to fill in the Venn Diagram with what each lens type has in common or does differently. Think about how the images look, what kind of story they might tell, and how much of the scene is in focus.”

Pass out the **Venn Diagram** handout and the **Venn Diagram Posters**, which contains sample images of the four lens types. Encourage them to reference their earlier Frayer models to connect terms like depth of field and bokeh to the photos they’re analyzing.

After the groups have completed their diagrams, have them compare with another group and discuss, “Did we put the same things in the middle?” “What do we notice about what didn’t go in the middle?”

Teacher's Note

You can use the Venn Diagram handout, or students can draw a two-circle Venn diagram.

100 minutes

Explain

Display **slide 12**. Students will conduct a Gallery Walk across four learning stations. Each station will feature enlarged images taken with different types of lenses, ranging from wide to narrow focal lengths and prime and zoom lenses.

Tell students, “Now that you’ve explored how focal length changes an image, let’s add another layer: lens type. Some lenses are prime, which means they have a fixed focal length—one setting, no zooming. Others are zoom lenses, which let you adjust focal length to frame your shot.”

“During this Gallery Walk, you will not only analyze what’s in the image but also infer what kind of lens might have been used: prime or zoom.”

As they move through each station, students will

- Examine the **Gallery Walk Posters**,
- Use clues (such as bokeh, background focus, and field of view) to determine:
  - The type of lens used (wide or narrow; prime or zoom)
  - The focal characteristics (short or long)
- Record their reasoning using the provided **Gallery Walk Response Sheet**

Advise students to “Move around the room to explore different photos, each taken with a different kind of lens. At each station, your goal is to figure out *what kind of lens was likely used to take the image* and *why you think that*. Use everything you’ve learned about focal length, depth of field, and bokeh to guide your thinking.”

Teacher's Note

The provided images will include varied compositions, including

- **Close-Up (CU)**: Shallow depth of field, strong bokeh (likely a narrow prime lens with long focal length)
- **Medium Shot**: Moderate depth of field (zoom or prime with mid-range focal length)
- **Wide Shot (WS)**: Deep focus, entire background in focus (likely a wide lens with short focal length)
- **Landscape**: Extreme wide angle with strong environmental context (likely a wide lens with a long focal length)

60 minutes

Extend

Move to **slide 13**. Explain to students that "You've been hired to film a wedding ceremony. It's going to be an outdoor afternoon wedding, bright and sunny, so you'll need to plan carefully for lighting and exposure. Your client expects high-quality footage with beautiful depth of field, soft background blur for close-up shots, and clear wide-angle shots of the venue. Your job is to build a custom camera kit that fits the needs of the shoot *and* your budget."

Hand out the **Scenario Information Sheet** and the **Equipment Cost Sheet**. Students must select the following items for their wedding shoot:

- **Camera body**
- **Lens (or lenses)** suitable for wedding conditions
- **ND Filter** (for controlling exposure in bright light)
- **Reflector** (for managing natural light on subjects)
- **Panel Light** (for shaded or indoor shots)

Display **slide 14** and encourage students to think about planning considerations such as:

- What lenses will give you the best results for portraits vs. wide venue shots?
- What focal lengths are ideal for wedding photography or videography?
- Does your lens choice support filters, and is your ND filter the correct size?
- Will your panel lighting need power, portability, or diffusion features?
- How does your reflector help in bright outdoor conditions?

Teacher's Note

A firm budget of $3,000 mimics real-world constraints. Encourage students to make trade-offs and encourage discussion with prompts like "Would you rather spend more on a lens or on better lighting?"

10 minutes

Evaluate

Transition to **slide 15**. Say “Before we wrap up today, I want you to take a moment to reflect on everything you’ve explored, from focal length and bokeh to choosing the right lens for a real-world shoot.” Review the 3-2-1 writing prompt:

- What are three things you learned in this lesson?
- What are two questions you still have?
- What is one thing you found interesting?

Have students respond individually in writing.

After writing, invite volunteers to share their responses with the class or in small groups. After the share out, ask “Who had a question that you also wondered about?” and “Did anyone’s “most interesting thing” surprise you?

Teacher's Note

This step builds classroom community and reinforces shared inquiry.

Resources

- Artem, S. (2022). *Alapaevsk railway 2022 Chernyshovka* [Photograph]. Source. https://commons.wikimedia.org/wiki/File:Alapaevsk_railway_2022_Chernyshovka_3.jpg
- Burgess, A. (2018). *Doonies Yawns - geograph.org.uk - 5702706.jpg* [Photograph]. Source. https://commons.wikimedia.org/wiki/File:Doonies_Yawns_-_geograph.org.uk_-_5702706.jpg
- K20 Center. (n.d.). 3-2-1. Strategies. https://learn.k20center.ou.edu/strategy/117
- K20 Center. (n.d.). Elbow partner. Strategies. https://learn.k20center.ou.edu/strategy/116
- K20 Center. (n.d.). Frayer model. Strategies. https://learn.k20center.ou.edu/strategy/126
- K20 Center. (n.d.). Gallery walk/Carousel. Strategies. https://learn.k20center.ou.edu/strategy/118
- K20 Center. (n.d.). Venn diagram. Strategies. https://learn.k20center.ou.edu/tech-tool/689
- Kraft, D. (2020). *Hieflau and Schafböndl 20mm wide 20200619.jpg* [Photograph]. Source: https://commons.wikimedia.org/wiki/File:Hieflau_and_Schafb%C3%B6ndl_20mm_wide_20200619.jpg
- Librarybell (2022). *Grand_Canyon_wide_shot_2022.jpg* [Photograph]. Source. https://commons.wikimedia.org/wiki/File:Grand_Canyon_wide_shot_2022.jpg
- Mahain. (2005). *Ilustracaodistfocalkw1.jpg* [Photographs]. Source. https://commons.wikimedia.org/wiki/File:Ilustracaodistfocalkw1.jpg
- Miloserdoff, M. (n.d.). *Focus* [Photograph]. Source. https://www.publicdomainpictures.net/en/view-image.php?image=319241
- Piqsels (n.d.). *Stone stack with blurred background* [Photograph]. Source. https://www.piqsels.com/en/public-domain-photo-frrjq
- Rabich, D. (2018). *Dülmen, Heilig-Kreuz-Kirche -- 2018 -- 1429.jpg* [Photograph]. Source. https://commons.wikimedia.org/wiki/File:D%C3%BClmen,_Heilig-Kreuz-Kirche_--_2018_--_1429.jpg
- Tookapic (n.d.) *Canon zoom lens (92/140)* [Photograph]. Source. https://www.goodfreephotos.com/business-and-technology/canon-zoom-lens.jpg.php
- U.S. Fish and Wildlife Service - Midwest Region (2024). *Narrow-leaved_cornflower_ (53833137009).jpg* [Photograph]. Source. https://commons.wikimedia.org/wiki/File:Narrow-leaved_coneflower_(53833137009).jpg
- Willis, T. (2007). *Wasp and spider 02.jpg* [Photograph]. Source. https://commons.wikimedia.org/wiki/File:Wasp_and_spider_02.jpg