

Learning Experience 9

Scientific Illustrations

DAILY MESSAGE/DO NOW

Lebron didn't hit clutch threes to win the big game when he starting playing basketball. Michelle Obama wasn't popular when she first began going to school. Guess who couldn't throw a spiral to save his life? - Tom Brady. Everyone has to start somewhere.

For the next few classes, we will learn about scientific illustration. Rate yourself on a scale of 1-10 (10 being a top score) of where you think your drawing ability lies now. What number do you hope to be by the end of our drawing classes?

HOOK

After spending time learning about the organisms in a forest ecosystem, we're now going to be artists drawing realistic illustrations.

Teacher Prep/Materials

- Laptop cart/computers
- EcoMUVE
- Experience 9 Presentation & Do Now
- Experience 9 - Sketch with Kyle
- Document Camera & Projector
- Watercolors & Brushes
- Watercolor Paper
- Graphite pencils
- SchoolCam App or Digital Camera & Tripod or Document Camera to digitize artwork

Summary

Visiting artist Kyle Browne will introduce students to drawing and watercolor techniques used for scientific illustrations to create their final food webs, including a forest background and organisms that support their solution to the Dover Island problem.

Understanding and Performance Goals

- Understand and explore perspective in the forest ecosystem
- Observe details in the plants and animals in the forest ecosystem
- Take risks in creative expression through their watercolor illustrations

Analyze (0-15 min.)

Before beginning the scientific illustration lessons, give students 10-15 minutes to complete their team final Claim & Evidence Planning Sheet, if needed. Not all the evidence/graphs needs to be collected before proceeding, but teams should have agreed upon a claim.

Expand (30 min.)

1. What is Scientific Illustration?
 - Detailed, accurate drawings, especially important to the field of

Time

150 minutes
(approximately 3
classes, but less time
may be needed)

Key Vocabulary

Scientific Illustration
Perspective
Birds-eye view
Worms-eye view
Zero-point perspective
Background
Middleground
Foreground
Proportionate

science before photography or to capture details that can't be captured in photographs.

- Highlight collegiate majors for scientific illustration such as California State University, Monterey Bay: <http://scienceillustration.org/> and John Hopkins University Medical School: <http://www.hopkinsmedicine.org/medart/>

2. What are we going to be drawing?

- Depending on which scientist role students took on, students will focus on different organisms.
 - Botanist: Trillium, Acorns, Shrub
 - Bird Watcher: Red-Tailed Hawk, Ovenbird, Hooded Warbler
 - Population Specialist: Wolf, Deer
 - Public Health Intern: Tick, Small Mammals (deer mouse, squirrel, rabbit)

3. How are we going to draw it?

- Introduce the artist materials such as the watercolor paints, paintbrushes, watercolor paper, and graphite pencils. Explain how to use properly each of the tools as well as how to make the most of the supplies. For example, to use the tubes of watercolor paint, only use a small amount of paint and large amount of water on the brush.
- Introduce the concepts of perspective in relation to art and their drawings, inviting students to consider drawing the team forest background as well as the organisms from a different perspective.
 - Birds-eye view: looking at the forest from the perspective of a bird flying over the area. Could also be top-down view.
 - Worms-eye view: looking at the forest from the ground-level.
 - Zero-point perspective: looking at the forest with no vanishing point/no parallel lines.

4. What goes into the Forest Background?

- Foreground, middleground, and background. Ask students to consider what is going to be drawn in each layer of their forest background, pulling from the experience of exploring the virtual environment in EcoMUVE.
- Consider proportions when drawing the forest background and the different organisms relate to one another in terms of size.

5. Drawing Organisms and Animals

- Use a document camera with a projector, if possible.
- Have students follow along drawing their own wolf while Kyle does a demonstration. Starting with simple shapes, students use a graphite pencil to draw their own wolf, using connecting lines/defining lines to bring the shapes together and outline the wolf.
- After completing a rough outline of the wolf, Kyle demonstrates how to use the watercolor colored pencils as well as the watercolor paints to fill in the details and shading of the wolf.

6. Observational Drawing

- Demonstrate examples of appropriate images to use an

Optional: Have students use Experience 9 - Sketch with Kyle to draw over the wolves instead of drawing free-hand.

observational images to replicate scientific illustrations. For example, EcoMUVE and the associated field guide can be one source for observational drawing. Another source could be doing a Google Image Search for a particular organism, finding an image that is of high-quality and large enough to see details.

Explore (90 min.)

It is expected that students will need 2-3 additional class periods in addition to the introductory scientific illustration lesson to complete all of their illustrations. A total of 150 minutes, or approximately 3 class periods, is given for this learning experience.

Meeting in their teams, students decide on a forest background, sketching out ideas and eventually agreeing upon a finalized design. As students complete their forest backgrounds, they should begin work on organisms that are associated with their scientist role as previously outlined.

When the organisms are drawn and colored, students should use scissors to carefully cut around the organisms in preparation for gluing them onto their team watercolor food web. Lastly, set up a station for students to photograph their completed forest background as well as their organisms to be uploaded into their Google Drive accounts. The best process seems to be uploading directly into a teacher Google account which is then shared with the appropriate team members. The CPSD Approved [SchoolCam app](#) can be used, but also digital cameras on tripods or document cameras work well to capture the images. Students need to access these photographs for use in their Scratch projects.

Students have completed their scientific illustrations when they have finished all the steps listed below:

1. **Research** your animals and plants on your computer. **Decide** which images you would like to draw.
2. Choose your **perspective**. Draw forest background and your organisms with pencil. Finalize pencil design.
3. Use watercolor or watercolor pencils to **paint/color drawings in**.
4. Carefully **cut out** organisms
5. **Take photos** of cut-outs and upload to your Google Drive.

Review, Extend, Apply (5 min.)

At the conclusion of each class, ask teams to report out on where they are will completing their forest backgrounds and organisms. Remind students the artwork is to be used as their final team food webs to demonstrate their understand of the relationships and transfer of energy in the forest ecosystem.

As students complete their illustrations, encourage them to revisit their Final Claim & Evidence Planning Sheet to guide analyzing and collecting graphs in EcoMUVE.