

Catch & Sketch Plankton

Ask A Biologist activity for classroom and home

By Colleen Miks

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Learn more

This is a companion PDF for these online articles:

Catch & Sketch Plankton

<http://askabiologist.asu.edu/experiments/sketch-plankton>

An Invisible Watery World

<http://askabiologist.asu.edu/explore/plankton>

About the Author

Colleen Miks received her Bachelors of Science in Fisheries Biology from Humboldt State University. She received her Masters of Education from Plymouth State University and teaches Earth and Space Science at Sossaman Middle School in Gilbert Arizona.

Experiment Overview

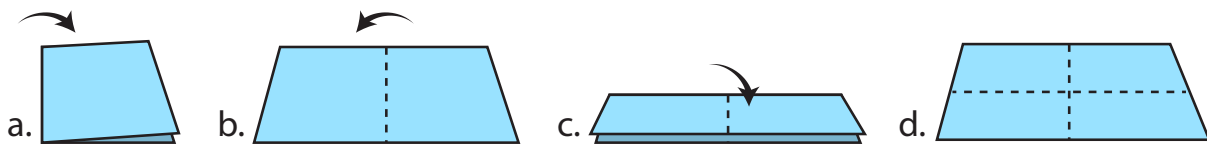
As you learned in Invisible Watery World, plankton come in many shapes and sizes. During this activity you learn the skill of scientific sketching as you practice sketching a variety of plankton.

Scientific sketching is a skill used by scientists to draw realistic pictures of organisms. Sketches can be used to identify new species and communicate information. Typically we take pictures to capture pictures of organisms, so why is it important to learn how to make a scientific sketch? Sketches require scientists to focus on detail and make keen observations that can be overlooked when taking a picture. In this activity, you will also learn about scale bars and use this information to sketch each variety of plankton in proportion to the others.

What you need

- Plankton Zoom Gallery (<http://askabiologist.asu.edu/images/plankton-gallery>)
- 1 sheet of white printer paper
- Pencil
- (Optional) Sample of pond water and Microscope

Procedure



Step 1: Take the sheet of white printer paper and fold it in half lengthwise, and then in half again so you have 4 squares. You will make one sketch inside each square.

Step 2: Choose 4 different plankton varieties from the Zoom Gallery to draw.

There are many varieties to choose from. Try to pick plankton that you have not seen before. This will challenge you to look at them in detail and draw what you see.

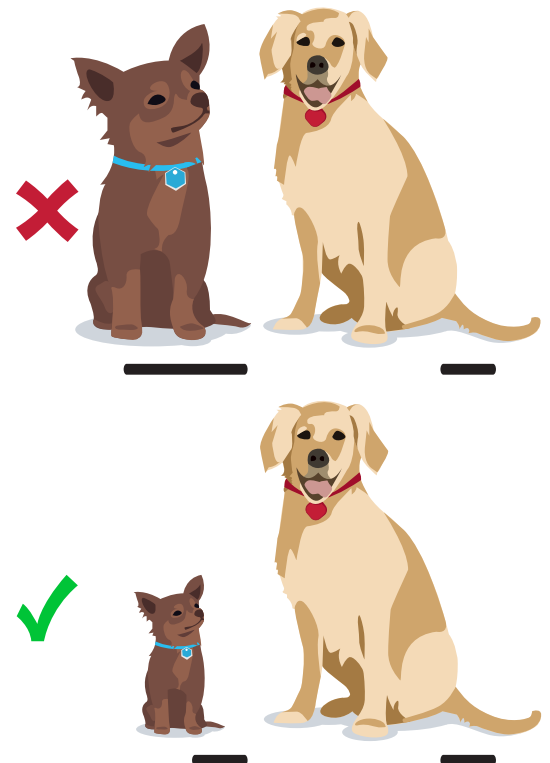
For example, we all have a basic idea of what a goldfish looks like, but in a cartoonish kind of way. Your goal is to draw the plankton as realistically as possible.

Step 3: Before you begin to sketch the first variety of plankton you need to determine how big to draw it.

The white lines on each image on the Zoom Gallery are called scale bars and are equal to 50 micrometers. You will be sketching the plankton magnified and can use the scale bars to find out what size to draw each variety on your paper.

Think about a Labrador retriever and a Chihuahua. Both are dogs, but are very different sizes. If you were to sketch both on the same piece of paper you would not draw them the same size, because the Labrador is much larger than the Chihuahua!

You will apply this idea to the plankton in the Zoom Gallery. Use the scale bars on the on the images to figure out what size to sketch each variety of plankton so that they are in proportion to each other.



Step 4: Select one plankton variety to start. Think about the following questions.

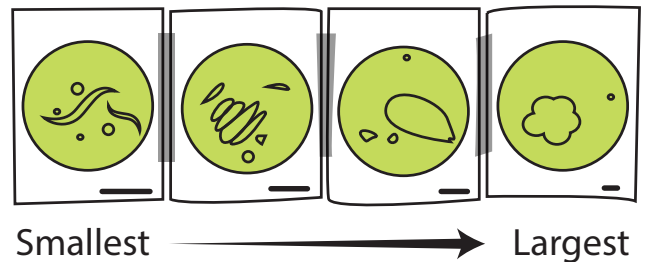
- What shape is it?
- Is it one organism, or many?
- What color is it?
- Can I see any organs inside the body?
- How large is this organism?

Step 5: It is time to begin sketching. Below is a list of guidelines to follow.

- Don't be intimidated.
- Pay close attention to detail and draw what you see.
- Start with the big stuff and then move on to fill in the details.
- Start sketching lightly. You can darken your drawing when you add the details.
- Don't get frustrated, just do your best. Scientific sketching is a skill and you only get better at it if you practice!

Step 6: Repeat steps 4 and 5 with each of the 4 varieties of plankton.

Step 7: We can compare the size of the 4 varieties since you drew them to scale. Cut on the folded line between each of your plankton sketches. You will have 4 separate squares, each with a plankton sketch on them. Now arrange the sketches by size, smallest to largest, and tape them together.



Step 8: Pair share with another group of students. Compare your sketches and write down your strengths and weaknesses. If your teacher instructs, complete this activity AGAIN with 4 new varieties of plankton. Focus on strengthening your weaknesses.

For Teachers

This is an interdisciplinary lesson that integrates science and math. This activity can be done using the “Plankton Zoom Gallery” or by collecting your own samples of pond water. You decide what is best for your students.

Tips for Classroom Implementation

Time Required: 50 minutes (Two 50-minute class periods if you plan on collecting your own pond water and sketching them as you view them under a microscope.)

Classroom set-up

- Zoom Gallery Option: Reserve the computer lab for this day. Each pair of students will need a computer so they can access the Plankton Zoom Gallery. Students should be supplied with a couple pieces of white printer paper and a pencil with an eraser.
- Plankton Collection Option: Students will need access to pond water (a nearby pond where you can collect as a class, or it can be supplied by the teacher). Each pair of students will need a microscope to view the plankton. Students should be supplied with a couple pieces of white printer paper and a pencil with an eraser.

Tips

- This activity can be done independently but I have found it works best in pairs.
- Read “Invisible Watery World” as a class before beginning this activity. It will teach students about varieties of plankton and their role in aquatic ecosystems.
- It is a good idea to start with a practice sketch of a familiar item. This lets students practice the detail in which they are sketching. Bring in a fish, apple, plant, soccer ball, or class pet and model the detail in which the students should sketch. This is also a great time to introduce scale.
- It is a challenge for some students to find and focus in on live, moving plankton. You can complete this activity in two days, the first day sketch plankton from the Zoom Gallery and the second sketch live plankton.

Extensions

- Select 4 different varieties of plankton and do the activity again. If you are feeling ambitious, sketch ALL the varieties of plankton in the Zoom Gallery and arrange them from the smallest to largest!
- This activity can be used along with the “It’s a Plankton Eat Plankton World” food web activity. After both activities are complete, students can create a double bubble comparing and contrasting zooplankton and phytoplankton. (print thinking map worksheet. or maybe interactive?)
- If you used the Plankton Zoom Gallery to complete your sketches the first time, now try the activity with live plankton. Go collect a sample from a local pond!

Objectives

1. Students will acquire the skill of scientific sketching
2. Students will use scale bars to sketch the plankton varieties in proportion to one another.
3. ***EXTENSION: Students will compare and contrast the sizes and feeding relationships of plankton.

Standards

Arizona Science Standards

Strand 1: Inquiry Process

Concept 2: Scientific Testing (Investigating and Modeling)

- Grade 6 PO 4. Perform measurements using appropriate scientific tools (e.g. microscopes).
PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.
- Grade 7 PO 4. Perform measurements using appropriate scientific tools (e.g. microscopes).
PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.
- Grade 8 PO 4. Perform measurements using appropriate scientific tools (e.g. microscopes).
PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.
- Grades 9-12 PO 5. Record observations, notes, sketches, questions, and ideas using tools such as journals, charts, graphs, and computers.

Strand 1: Inquiry Process

Concept 3: Analysis and Conclusions

- Grade 6 PO 1. Analyze data obtained in a scientific investigation to identify trends.
- Grade 7 PO 1. Analyze data obtained in a scientific investigation to identify trends.
- Grade 8 PO 1. Analyze data obtained in a scientific investigation to identify trends.
- Grades 9-12 PO 1. Interpret data that show a variety of possible relationships between variables.

Strand 1: Inquiry Process

Concept 4: Communication

- Grade 6 PO 2. Display data collected from a controlled investigation.
- Grade 7 PO 2. Display data collected from a controlled investigation.
- Grade 8 PO 3. Present analyses and conclusions in clear, concise format.
- Grades 9-12 PO 3. Communicate results clearly and logically.

Common Core Standards

Speaking and Listening

Grades: 6-8.SL.4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Grades: 6-8.SL.5. Include multimedia components (e.g., graphics, images, music, and sound) and visual displays in presentations to clarify information.

Grades: 9-10.SL.4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

Grades: 9-10.SL.5. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

Reading Literacy and Technical Subjects

Grades: 6-8.RST.3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Grades: 9-10.RST.3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

EXTENSION: 6-8.RST.9. Compare and contrast the information gained from experiments, simulations, video or multimedia sources with that gained from reading a text on the same topic.

EXTENSION: 9-10.RST.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

Next Generation Science Standards

MS-ETS1-2.

- Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3.

- Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4.

- Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.