

COMPARISON

Students observe two similar species or objects (such as two types of lupine, trees, mushrooms, or flowers) and sketch them side by side, noting differences between them.

Comparing two similar subjects makes their unique details stand out. Comparison is a basic tool used in scientific investigations to reveal patterns or collect data. When students make comparisons in nature, they will generate numerous relevant observations. This baseline of observations can support students to start thinking about how different structures work or how varied conditions might have affected the subjects they observed. Students can continue to use comparison as a tool in their journals.

NATURAL PHENOMENA

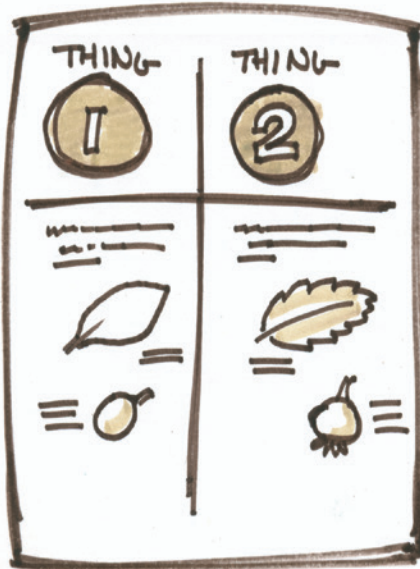
Find a location where students can observe two species or objects that are generally similar, such as two kinds of willows; gopher and mole mounds; two kinds of eggs, seeds, or fruit; elk and deer; pill bugs and sow bugs; two kinds of shells; or poison oak and blackberry. Students can also compare two organisms of the same species or two areas subject to different conditions—for example, a puddle in sun vs. one in shade, a plant grown inside vs. one grown outside, an exposed vs. sheltered location, or wet vs. dry. If you would like to use the activity to build students' understanding of specific science concepts, prompt the whole group to journal about the same thing so that they have common experiences and observations to work from.

PROCEDURE SUMMARY

1. Compare the two subjects using words, pictures, and numbers to show similarities and differences.
2. Record any questions that come up.

DEMONSTRATION

When the whiteboard icon appears in the procedure description: Draw a T chart to organize the data and object titles. Add descriptive elements and drawings in a parallel structure, emphasizing that you are showing the difference between the elements on each side.



PROCEDURE STEP-BY-STEP

1. Explain that students will compare two different species or objects, using words, pictures, and numbers to record what they see.
 - a. "You will be making comparisons between these two [trees, plant species, insect exoskeletons, rock types, leaf shapes, etc]."
 - b. "Your goal is to notice similarities and differences, then record them using words, pictures, and numbers."

Time

Introduction: 5 minutes
Activity: 10–40 minutes
Discussion: 10–15 minutes



Materials

Journals and pencils



optional

Rulers
 Hand lenses

Teaching Notes

Choose two subjects that are relatively similar to each other. This is key to the success of this activity. Compare an orange to an elephant, and the differences are so vast that it becomes overwhelming to describe them. Compare an orange to a lemon, though, and all sorts of relevant details jump out—the texture of the skin, the shape of the fruit, the attachment point of the stem, and the like.



2. Give some suggestions for how students could record their observations and structure their journal entry.

a. "Think about how to structure your page to show the two subjects."



b. "You could divide your paper with a line down the middle and put one object on either side.

Or, if you have another idea of how to organize your page, go for it! If you note a detail on one side of the line, show how it is different on the other side."

3. Tell students that they must use words, pictures, and numbers in their journal entries, but can use more of whichever form of note taking they are most comfortable with.

a. "You must use a combination of words, pictures, and numbers to record your observations. But you can use more of whichever approach is comfortable for you."

b. "Some similarities or differences may be easier to show in writing, and others may be easier to show in drawing. Be thoughtful about which approach you use to show different kinds of details."

4. Share some specific strategies for diagramming the subject based on its size, and remind students of any drawing strategies or approaches they already know.



a. (If students are comparing two very large things, such as two tree species) "You don't have to draw the whole tree. You could show one leaf and a sample of the bark, then do a very small drawing of the overall shape of the trees next to each other to show their differences in stature."

b. (If students are comparing something smaller than their journal) "Make your drawing life size or larger than life, and be sure to note how much you have enlarged the drawing. You might choose to do an inset and just magnify part of the object."

c. "Remember, the goal isn't making a pretty picture, it's recording accurate observations. Use any of the drawing or diagramming strategies you already know to record information efficiently."

5. Ask students whether they have any questions about what they'll be doing, set boundaries, then send them out to journal.

6. As students work, take time to keep track of time, circulate and troubleshoot, and engage students in dialogue about their choices and strategies for recording information.

7. (A few minutes before you will call students back) Say: "Take about two minutes to wrap up and add any final details to your journal entry."

DISCUSSION

Lead a discussion using questions from one of the Crosscutting Concept categories. Intersperse pair talk with group discussion.

Patterns

- a. "What are some patterns you noticed as you made your comparisons? What features were similar in each subject? What was different?"
- b. "Why might those features be similar or different?"

Cause and Effect

- a. "Look back at your journal page and focus on the differences between the two subjects or areas of study. What are some possible causes for the differences you observed?"
- b. "Why do you think there was more or less _____ in each of the areas you observed?"
- c. "What might have caused any of the patterns you observed?"

Structure and Function

- a. "What were some of the differences that you observed? How were the structures [such as leaves, bark, or branches] different from one another? What differences were there in overall structure and growth pattern?"
- b. "Pick one type of structure [such as leaf, bark, or branches] to focus on. Turn and talk to someone near you about how the two structures are different from one another. Then discuss: How might they function differently?"

Side-by-side comparisons help students see subtle differences they would otherwise overlook.

This color-coded Venn diagram shows high-level thinking and graphic visualization skills. Looking at student journals enables you to see how and what students think!

