

Leafin through a Lab Notebook

FRAMEWORKS

- I. Scientific and Engineering Practices 3, 8
- II. Cross-Cutting Concepts 6
- III. Disciplinary Core Ideas LS 2, LS 4, ETS 2

SKILLS/OBJECTIVES

- To learn about leaf identification
- To draw scientifically from a model
- To learn the purpose of using lab notebooks
- To make and record observations

MATERIALS

- Variety of leaves for each person
- Clean sheets of paper for leaf rubbing
- Lab notebooks with Title page worksheet, leaf observation worksheet, and describe your leaf worksheet
- Colored pencils or crayons to rub leaf
- Magnifying glasses
- Glue sticks
- One leaf identification book (if the students finish their activities, let them look through this book and relate it to what they just learned)

NOTES

- Beforehand, glue the title page, leaf observation page, and describe your leaf worksheet (in that order) into the first few pages of the notebook.
- Mentors should work in small groups for the second activity.
- If writing is a challenge, have the kids draw descriptive pictures

BACKGROUND

- Science is an activity performed over a long period of time, so scientists have to keep track of what they do from day to day, experiment to experiment.
- In order to do this, scientists write down everything they do in a lab notebook, which they can look at later. It can be used if they need to recreate an experiment or if they want to track a pattern in nature.
- We are going to use lab notebooks today to record the leaves which we cannot take home. Therefore, it is very important that we use our words and pictures to represent the leaves as best as we can. That way, we can know exactly what our leaves look like, long after they have been crushed or raked away.
- We will use scientific terminology as well as pictures to convey information about our leaves. Anybody who reads our notebooks should be able to know exactly what we're talking about, even if they have never seen our leaves before.
- It is also important that when dealing with leaving organisms, we do not harm them, so we will not pick any leaves off of trees. We can draw and observe them while on the tree or make rubbings of ones found on the ground.

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| Activity # 1 | Learning about Lab Notebooks |
| Materials | -lab notebooks |
| Worksheet | yes |

- **Tell the kids that they are receiving very special lab notebooks!** (Best not to give them the notebooks until after the discussion so they don't get distracted)
- **Real scientists use notebooks like these to make observations and notes so they can remember what they did and replicate their work in the future.**
- **Scientists go out into the field and write OBSERVATIONS in their lab notebooks.**
- **What is an observation?** (a detailed description of what you see/hear/smell/touch/count etc.) **What is an example of something you could write in a lab notebook?**
- **Hand out the lab notebooks, and tell the kids to write their names in them.**
- **Tell them to write the date on the first page and record a few observations about the weather.**
- **Let them go outside and search for leaves. DO NOT KILL LEAVING LEAVES!**
- **On the leaf identification page, have them write down 3 observations about where they found the leaves. If they can't write, have them draw a map. These observations must be so good that we should be able to tell where they got the leaves from.**
- **After 10ish minutes, gather everyone back together.**

- **Ask for three volunteers to read their observations about the location in which they found their leaves. Let everyone in the class guess where it was.**

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|--------------|---|
| Activity # 2 | Leaf Recording |
| Materials | <ul style="list-style-type: none"> ○ Leaves ○ Lab notebooks ○ Clean paper ○ Colored pencils or crayons ○ Glue sticks |
| Worksheet | yes |

- **Break up students into small groups**
- **Tell the kids to conduct a scientific examination on the leaves they brought back (if any) and the ones provided by Science Outreach.**
- **Examine the leaves with a magnifying glass. What can you see?**
- **Do you see the lines that run from the middle out to the edge of the leaf? These are called “veins.” Did you know that both humans and plants have veins? What are they used for?** Blood runs through our veins carrying oxygen and nutrients to all parts of our body. Plants use veins for the same purpose, but they use water instead of blood. We get our nutrients from food, but plants get theirs from the soil.
- **Do you know what plants breathe?** Plants breathe in CO₂ and exhale O₂, the reverse of human respiration. That’s one of the reasons plants are so important to people. On the underside of each leaf are tiny tiny pores called “stomata.” Stomata open to allow respiration and close to prevent water loss.
- **What color is your leaf? What makes plants green?** Chlorophyll is a green pigment which is responsible for photosynthesis, the creation of usable energy from light, in plants. It is green because it absorbs primarily blue and red colors of white light. Green is unused, therefore, it is the color that we see!
- **Have them choose one leaf and fill out the Describe Your Leaf worksheet.**
- **Provide paper and colored pencils or crayons to “rub” the image of the leaf onto the paper.** Hold the colored pencil to the side or hold the crayon horizontally and rub lightly to get the best image. **Make sure the kids write their name on the drawing.**
- **Glue the rubbing onto the front of the lab notebook.**
- **If there is extra time, the kids can make more leaf rubbings or look through the leaf identification book.**

Conclusions

- You can keep using your lab notebook to make more observations about leaves.
- Ask questions and gather evidence so you can answer them over time. For example, how do you think the changing weather will affect the leaves? Are there leaves of different colors? How does location of a tree dictate the shape or color of a leaf?
- Or you can use your lab notebook to keep track of experiments you do on your own! What happens when you mix vinegar and baking soda?
- Keeping a neat and consistent lab notebook is essential in becoming a good scientist!



LAB NOTEBOOK TITLE PAGE
SCIENCE CLUB

Name:

| Date | Weather | Activity |
|------|---------|----------|
|------|---------|----------|

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

LEAF OBSERVATIONS

Draw your leaf.

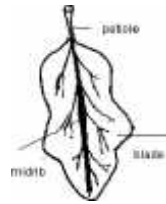


Draw or describe where you found your leaf below. If you know what tree it came from, draw that tree.



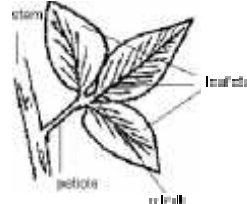
Describe Your Leaf!

Is your leaf simple (only has one leaf) or compound (lots of leaves on the same stem)? Circle the answer.



simple

OR



compound

Is your leaf lobed or unlobed ?



lobed

OR



entire

Does your leaf have teeth or is it smooth ?



dentate

OR



sinuate

What do the veins look like in your leaf?



parallel

OR



pinnate

OR



palmate

From these **observations**, what kind of leaf do you have?