

Hummingbird Lunch

Ask a biologist activity for classroom and home

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This is a companion PDF for these online articles:

Hummingbird Lunch

<http://askabiologist.asu.edu/experiments/hummingbird-feeder>

Hummingbirds

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

About the Author

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Experiment Overview

In backyards all over the country we often get to see beautiful birds and hear their calls. One bird is a standout for its beauty, grace and elegance—the hummingbird. As you learned in the Hummingbirds story, they are often attracted to the red hummingbird feeders that we hang outside. But why? Would they be just as attracted to a white feeder? In this activity, you will set up feeders of different colors and measure how much nectar hummingbirds drink from the different feeders.

Materials

- Four hummingbird feeders (exactly the same)
- Nectar (exactly the same for the entirety of the project)
- White paint that bonds to plastic
- Measuring cup (to measure volume)
- One permanent marker
- Four shepherds hooks (or another place to hang feeders)

Two additional feeders if you want to control for effects of evaporation (especially important for hot climates—see step 7 of procedure)

Procedures

- Step 1:** Gather all materials. Wash and dry your feeders with hot water and make sure they hold water without leaking.
- Step 2:** Using the white paint, paint the red parts of only two of the feeders to make them white. Allow them to dry.
- Step 3:** Using the appropriate tool to measure the volume of liquid (ml or cups) place a small, predetermined amount of water in your feeder.
- Step 4:** Once you have put the small amount of water in the feeder, place the feeder upright and using the marker; place a dash on the plastic with the amount of liquid written. Continue doing this in even increments to make a scale on the side of the feeder. Repeat this step on all four feeders.
- Step 5:** Repeat these steps on all four feeders.
- Step 6:** Fill one red and one white feeder with nectar. Mark the bottom or very top for easy recognition.
- Step 7:** Fill one red and one white feeder with water. Mark the bottom or very top for easy recognition. The water-filled feeder will help you determine whether it is the red feeder

that attracts the birds, or a combination of the feeder and the nectar. Place the feeders in your predetermined location. (Note: if your resources allow, you can use additional feeders in a non-accessible location—one that has similar temperature and air flow—to test for effects of evaporation. This will be especially useful in hot climates. Measure the amount of water that evaporates from your non-accessible feeder and subtract that from changes in your accessible feeder. Controlling for evaporation will be most important for the feeder with only water, but is useful for the nectar feeder as well.)

Step 8: Check on the amount of liquid in your feeders every day or every few days (just keep it consistent). Continue this experiment for a few weeks. Use a table to organize your data that you collect.

Use the table below to record your results

White Feeder w/ nectar	white feeder w/ water	Red feeder w/ nectar	Red feeder w/ water	comments

After the experiment

Analyze your data: What trends have you noticed? Are the hummingbirds drinking nectar from one feeder more than the other? What data do we have to support this?

Communicate your results. Pick a format of your liking and communicate your results. Be sure to consider the role, the reader and the effective communication of the results. (Choose from: newspaper article, formal written scientific paper, or an online media source-blogs; see Teaching Tips for more information.)

Teaching tips

Time Required: The setup of this activity takes at least one 30-minute period. Students are broken into groups and each group is responsible for one feeder or the creation of the lab sheet. The collection of data only took about 5 minutes of the day. This lab should be completed over several weeks and students should collect data on the same day(s) each week.

Classroom Setup: The majority of observations are done outside (aside from watching a video before beginning). A little classroom space is required for the initial set up.

Before you begin

- Do an internet search of your state or town and “hummingbirds” to make sure at least one species of hummingbirds lives in your area (they are only found in the Americas).
- Make sure to have one feeder outside for a week or two before you try the experiment so local hummingbirds will know they can get food in your school yard. The time before they notice it may vary.
- Read the Hummingbirds story to make sure you are familiar with what and how hummingbirds eat, as well as the importance of color to this type of bird.
- Watch the video on the hummingbird vision and color page (<http://askabiologist.asu.edu/vision-and-color>) and make 5-7 observations. Look at what the hummingbirds are doing, and write down interesting things that you noticed. If students have a feeder in their yard with hummingbirds that come to eat, they can observe that as well.
- A good place to record your observations would be a science notebook. This will help you keep your thoughts and ideas in one spot.
- Once you have at least 5-7 observations, come up with some related questions. See the table below for two examples.

example observation chart

Observations	Question
Red feeder	Are hummingbirds attracted to red feeders?
Lots of hummingbird species feeding	What hummingbirds are in my area?

Tips

- In this experiment the students will make observations of hummingbirds feeding at hummingbird feeders. Students will come up with questions that they generate from their observations. Students will then test if the color of the feeder has any effect on the hummingbirds that utilize these feeders.

- Data collection will only require a few minutes each day over the course of a few weeks. Students should then work together in small groups to gather their evidence, look for trends, and prepare to communicate their results in a report formatted as a newspaper article, online blog, or a scientific paper.
- It is recommended that students have some knowledge of the scientific method and experiments in science.
- This can be set up as a full inquiry model where the teacher guides student thinking or as a directed inquiry where the teacher supplies the necessary information. Be sure to pay attention to the suggestion for additional controls in step 7.

Extensions

A variety of extensions can be used with this experiment. A teacher could look at adaptations of hummingbirds or the theory of co-evolution regarding the shape of the beaks and the shape of flowers. Students could also do additional research to find answers to the questions they asked at the beginning of the experiment.

Objectives:

- Students will investigate whether hummingbirds are more attracted to red feeders than to white feeders.
- Students will collect and compare data based on observations.
- Students will interpret data and form conclusions.

Teaching R.A.F.T.

The writing piece of this experiment includes a RAFT assignment. This stands for Role, Audience, Format and Topic. RAFT helps develop students as more skilled writers and communicators of ideas. Both teacher and student alike can pick an audience to write for, a role, a format and topic.

In this case the topic would be hummingbirds and the feeder experiment. The students could choose to present their findings in a newspaper article and write for a larger public audience or they could write a formal scientific paper. Both ways would allow the students to communicate their main ideas from the experiment and their takeaways but allow students more freedom of expression.

Teachers could also choose to assign the R.A.F.T for a specific purpose. Asking students to write in a more academic tone would require the use of their scientific vocabulary or Tier Three vocabulary terms. See the link below for more information.

<http://www.readwritethink.org/professional-development/strategy-guides/using-raft-writing-strategy-30625.html>

Arizona Science Standards

Strand One: Inquiry Process

Concept 1: Observations, Questions, Hypotheses

K-4 Observe, ask questions, and make predictions

5-8 Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.

Concept 2: Scientific Testing (investigating and modeling)

K-4 Participate in planning, and conducting investigations, and recording data

5-8 Design and conduct controlled investigations

Concept 3: Analysis and Conclusions

K-4 Organize and analyze data; compare to predictions

5-8 Analyze and interpret data to explain correlations and results; formulate new questions

Concept 4: Communication

K-4 Communicate results of investigations

5-8 Communicate results of investigations

Common Core Standards

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

6-8.WHST.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Next Generation Science Standards

MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.