

Elementary GLOBE



A Learning Activity for The Mystery of the Missing Hummingbirds

Honing In On Hummingbirds

Purpose

- To provide students information on ruby-throated hummingbirds.
- To provide students with the opportunity to do research on hummingbirds in areas that interest them.
- To provide students with the opportunity to share their knowledge with others.

Overview

In this activity, students will record a list of things they already know about hummingbirds and a list of things they would like to learn about hummingbirds. Then they will conduct research to find out some of the information they want to know. Using their new knowledge, each student will make a hummingbird out of art supplies. Finally, using their hummingbirds as props, the students will play charades to test each other in their knowledge of the ruby-throated hummingbirds.

Student Outcomes

After completing this activity, students will gain knowledge about ruby-throated hummingbirds. They will also gain experience researching a topic of their choosing related to hummingbirds and communicating those results in several different formats.

Next Generation Science Standards

- DCI LS-1A: Structure and Function
- Science Practice 2 Developing and Using Models
- Science Practice 8 Obtaining, Evaluating, and Communicating Information

CCSS.ELA Anchor Standards

- W.4 Produce clear and coherent writing...
- W.7 Conduct short as well as more sustained research projects...
- W.8 Gather relevant information from multiple print and digital sources...

CCSS.Math Content Standards

- MD A.1, A.2, A.3 Measurement and Data

Geography

- 1 How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

Time

- Part 1: One 30- to 45-minute class period
- Part 2: One 30-minute class period
- Part 3: One 30- to 60-minute class period

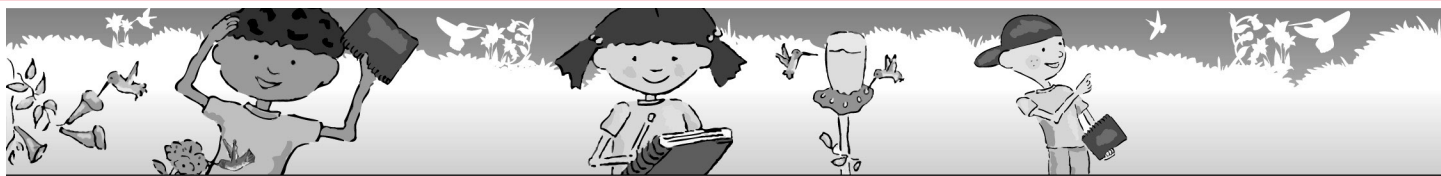
Level

Elementary (most appropriate for grades K-4)

Materials

For Parts 1-3:

- *Elementary GLOBE* storybook: *The Mystery of the Missing Hummingbirds*
- Chart paper and markers
- Computers with Internet access (or print-outs of the web pages listed)
- Basic art supplies (construction paper, scissors, glue, markers/ crayons, colored feathers, foam, clay, paint, etc.)
- Scale, rulers
- *Honing In On Hummingbirds Fact Sheet* (one per student)
- *Honing In On Hummingbirds Student Activity Sheet* (one per student)
- Optional: *Honing In On Hummingbirds RTHU Template* (one per student)



Preparation

- Read the *Elementary GLOBE* storybook *The Mystery of the Missing Hummingbirds* – either read it to the class or have students read it to themselves. The book can be downloaded from www.globe.gov/elementaryglobe.
- For Part 1, prepare three charts to use with the class. The titles for the charts are: “What we already know about hummingbirds,” “What we want to learn about hummingbirds,” and “What we learned about hummingbirds.”
- Depending on the ability level of the students, the teacher might want to pull some of the ruby-throated hummingbird research together in advance (see the websites listed in Part 2).
- Set up art supplies for Part 2.

Teacher's Notes

The Ruby-throated Hummingbird (*Archilochus colubris*), known in Spanish as colibrí garganta rubí, is the most widely distributed of all hummingbirds. They come readily to artificial feeders and are tolerant of humans. Ruby-throated Hummingbirds (RTHU) are fascinating creatures that can immediately capture a student's imagination and lead him or her into scientific investigation and discovery.

RTHUs are migratory insect- and nectar-eating hummingbirds that range from Central America to Alberta, Canada, and from the east coast of the United States to the middle of the Great Plains. They breed in the eastern U.S. and southern Canada and winter over from Mexico south to the Panama Canal (occasionally in southern Florida and along the U.S. Gulf Coast and very rarely elsewhere in the continental U.S.). The map below shows the species' distribution (see Figure 1). Some birds fly non-stop across the Gulf of Mexico and others fly overland through Mexico. Scientists think RTHUs begin their migration north in the spring and south in the autumn due to changes in day length, but they are not sure.

RTHUs have the widest breeding distribution of any of the 338 hummingbird species. Females build nests, incubate the eggs, and care for nestlings. Female RTHUs have been known to lay a second or third clutch of eggs in one breeding season, though it is not clear whether this behavior occurs regularly or because an earlier nest failed due to predation or another interference.

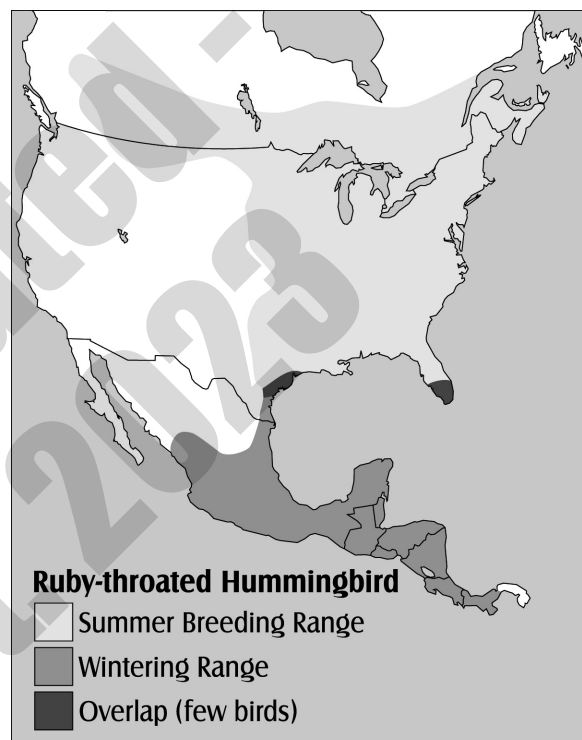
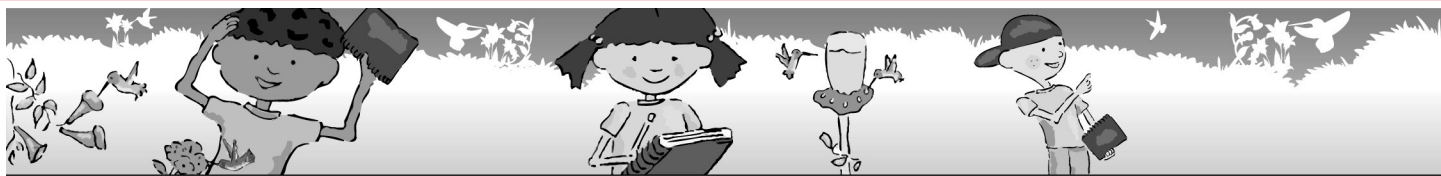


Figure 1: Distribution of the Ruby-throated Hummingbird (*Archilochus colubris*).

All RTHUs have dark iridescent green backs, foreheads, wings, and tails. Adult male RTHUs have iridescent red coloring on the throat, called a “gorget,” while adult females typically have white throats (see Figures 2 and 3). Although this is very rare, sometimes an adult female will show light streaking on her throat in early spring.

Newly hatched male and female RTHUs do not have red on their throats; they both resemble adult females, making it difficult to determine sex or age among white-throated birds during late Spring, Summer, and Autumn. However, young



males sometimes have throats streaked with green or black and some even acquire a few red throat feathers prior to Autumn migration (see Figure 4). RTHU males of any age are typically up to 25% smaller than females, but size should not be used as a factor when determining the sex of the hummingbirds.



Figure 2: Adult male Ruby-throated Hummingbird, with full red gorget.



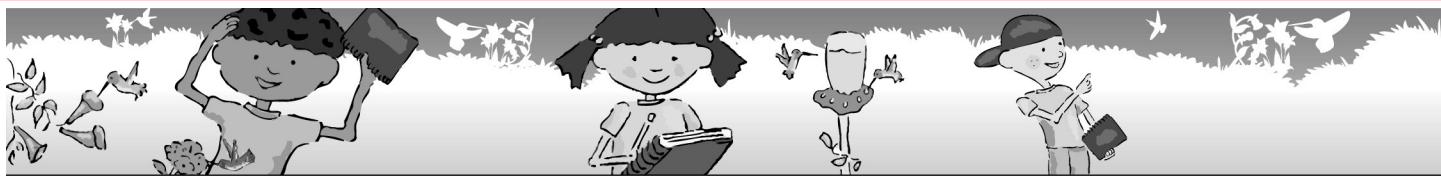
Figure 3: Adult female Ruby-throated Hummingbird, with unmarked white gorget (Young female RTHUs and most young males also have unstreaked white throats.)



Figure 4: Young male Ruby-throated Hummingbird with throat streaking.

More information and photos about RTHU biology, behavior, and ecology can be found on the website for Operation RubyThroat: The Hummingbird Project at www.rubythroat.org, on the website for *Journey North: A Global Study of Wildlife Migration and Seasonal Change* at www.learner.org/jnorth/, or see the Earth as a System section of the *GLOBE Teacher's Guide* (www.globe.gov).

Note: if your school is not located in the RTHU habitat zone, there are many other kinds of hummingbirds in the United States (some of these birds migrate in the winter and some do not). Your students can study other hummingbird species and you can complete this activity based on that kind of hummingbird. Go to www.rubythroat.org/OtherSpeciesMain.html for more information on other hummingbird species.



Ruby-throated Hummingbird (RTHU) Fact Sheet

Appearance:

- RTHUs are approximately 8.5 cm (3.5 in.) long from the tip of the beak to the tip of the tail
- Adult females are larger than adult males
- Adult males have a red throat, females have a white throat (sometimes with streaks), and juvenile males often have streaking and sometimes have a little bit of red on their throats at the end of the summer

Migration:

- RTHUs migrate from the eastern United States and Canada to Mexico and Central America in the fall and return in the spring
- RTHUs double their weight in the weeks prior to migrating (from approximately 3 grams to 6 grams)
- RTHUs fly approximately 40 kilometers per hour (25 miles per hour)
- Their wings beat 60-80 times per second during normal flight (kids should try to move their arms that quickly!)
- It takes 20 hours for the RTHU to fly across the Gulf of Mexico – and this is only part of their migration route!

Feeding:

- Each bird eats about its weight in nectar or sugar water each day
- They eat nectar and small insects

Breeding:

- RTHU eggs are 8-13mm in diameter (about the size of a jelly bean)
- RTHU males may mate with more than one female
- RTHU females lay the eggs, take care of the eggs in the nest, and raise the chicks
- RTHU females usually lay two eggs

Nesting:

- RTHUs nest in mature trees and like to be near flowering plants for feeding

What To Do and How To Do It

Part 1: Hummingbird Lore

1. After reading the *Elementary GLOBE* book *The Mystery of the Missing Hummingbirds*, fill out the following two charts with your class: "What we already know about hummingbirds" and "What we want to learn about hummingbirds." You may want to prompt the students about hummingbird information found in the book. Also, for this activity, your primary focus should be ruby-throated hummingbirds (RTHUs) rather than all types of hummingbirds. Have the students record their responses on the top part of the *Honing In On Hummingbirds Student Activity Sheet*.
2. Based on the information the students list in the charts, plan to do some further research with your students to learn more about Ruby-throated Hummingbirds. Refer to the Ruby-throated Hummingbird Protocol in the Biosphere section of the *GLOBE Teacher's Guide* (www.globe.gov). There is also a lot of good information about RTHUs at: www.rubythroat.org.
3. Break the students into groups based on topics the class decides upon. Use guided practice to assist with this step in the activity. Possible topics for further study include: migration, habitat, appearance (size, color, etc), feeding, breeding, nesting, etc. Go to www.rubythroat.org/RTHUMain.html for a sample list of hummingbird categories.
4. Depending on your students' ability level, they can look for information on the website by themselves or with the help of an adult. Or you can prepare the *Ruby-Throated Hummingbird Fact Sheet* in this activity to share information about RTHUs.
5. Have each group of students write and/or draw the information they learned about their hummingbird topic.
6. Once all of the groups have finished their hummingbird research, gather the class together and have each group share three things they learned about their topics. If they learned more than three things, they will have the opportunity to



share more information during the charades game (Part 3 of this activity). Also have the students record what they learned on the bottom section of the *Honing In On Hummingbirds Student Activity Sheet*.

Part 2: Hummingbird Creations

Note: This activity can be done as a whole group or it can be incorporated into a small group center.

1. After the students have shared their hummingbird information, tell the class that each student will now make his or her own hummingbird. Explain to them that they are making a scientific model of a Ruby-throated Hummingbird as opposed to having the freedom to use their creativity in making their bird look however they want.
2. Encourage them to include specific details about RTHUs when making their creations. Explain the idea of “form and function” to the students and have them include those features in their birds. For example, they should decide if their bird is male or female, and if it is a male they should decide if it is a juvenile or an adult; this way they can color the bird’s neck accordingly (adult males have a red neck). Other distinctions are the birds’ size, how they eat, etc.
3. Place the supplies for making the hummingbirds at tables around the classroom and have the students work in groups. This part of the activity can also be a center with other activities in a rotation. Encourage the students to make their birds three dimensional and to use the various supplies provided for them. Provide a ruler so the students can measure their birds to see if they are the right size. Optional: Use the Ruby-throated Hummingbird template at the end of this activity as a model students can trace or cut-out for their bird creations.
4. Provide a scale so the students can weigh their hummingbirds. If their birds are lighter than the RTHU, which is typically three to six grams, have them add materials to their birds so they are heavier (they can add sand or marbles to the inside of the birds to increase their weight, or use clay as one of the materials because it is heavier than paper).

5. Optional: Use the *Honing in on Hummingbirds RTHU Template* for this activity. The labeled version provides details for accurate RTHU colors. The blank version can be cut out for this activity; students can cut out two copies of the template, color them, staple the two cut-outs together, and stuff them to make them look three dimensional.
6. After the students have finished making their hummingbirds, have them take turns presenting their birds to the class so they can share the details they included.

Part 3: Hummingbird Charades

1. Gather the class together and review the first two charts they created. Place the third chart, entitled “What I learned about hummingbirds” next to the other charts.
2. Have the students take turns listing information to put on the third chart. This should be a review of the research the different student groups conducted during Part 1.
3. Explain to the students that now they are going to play a game of hummingbird charades. Write items from the third chart on strips of paper.
4. Divide the students into two groups. Have one student from the first group select one of the hummingbird facts on a strip of paper. Then he/she needs to act out this hummingbird fact according to traditional rules of charades (the teacher will need to explain the rules to the students if they haven’t played charades before). The students can use the hummingbirds they made in Part 2 of this activity to help them act out the charades.
5. Once the first team has successfully figured out the information their teammate was acting out, a student from team number two will select a fact and act it out for his/her team. Continue the game for until you have gone through all of the facts, or until you run out of time for the activity.



Adaptations for Younger and Older Students

When playing charades with younger students, have one group act out a fact for another group, rather than having individual students act in front of the class. This strategy allows younger children to feel more comfortable and confident. The teacher can also help the whole group brainstorm how to act out a certain fact before students act it out in front of the rest of the class.

Using a Venn diagram, older students can make comparisons about hummingbirds (male/female, juvenile/adult, etc.). They can also do more research and compare the RTHU with another kind of hummingbird or compare hummingbirds with another kind of bird.

Further Investigations

- **Hummingbird Garden:** Plan a hummingbird garden with your class. Discuss with the class what attracts hummingbirds to a garden and develop one on your school grounds. This garden can be a site for other scientific observations and investigations.
- **More Hummingbird Creations:** Conduct research about the physical appearance of other types of hummingbirds and have the students make different kinds of hummingbirds with their art supplies. Also, allow the students to use creativity making different hummingbirds and have them explain why they have their various physical characteristics.
- **Color Versus Nectar:** While it seems that hummingbirds are attracted to red flowers because of their color, these flowers actually have sweeter nectar than other flowers. Conduct a study of this with your students to try and learn why. Set up a few different feeders and put different colors of food coloring in the feeders and make observations about which feeders the hummingbirds go to.

- **Communicate with Other Students:** Establish communication with a school in Mexico or Central America (as the GLOBE students did in *The Mystery of the Missing Hummingbirds*) and communicate with that school about animals that migrate from your region to this country (hummingbirds, monarch butterflies, geese, etc.).
- **Ruby-throated Hummingbird Investigation:** If your school is located in the Ruby-throated Hummingbird's range, participate in the Ruby-throated Hummingbird Protocol. For more information, look at the protocol in the *GLOBE Teacher's Guide* (www.globe.gov). If your school is not located in this geographic range, have your students make observations of other hummingbirds that live in your area.

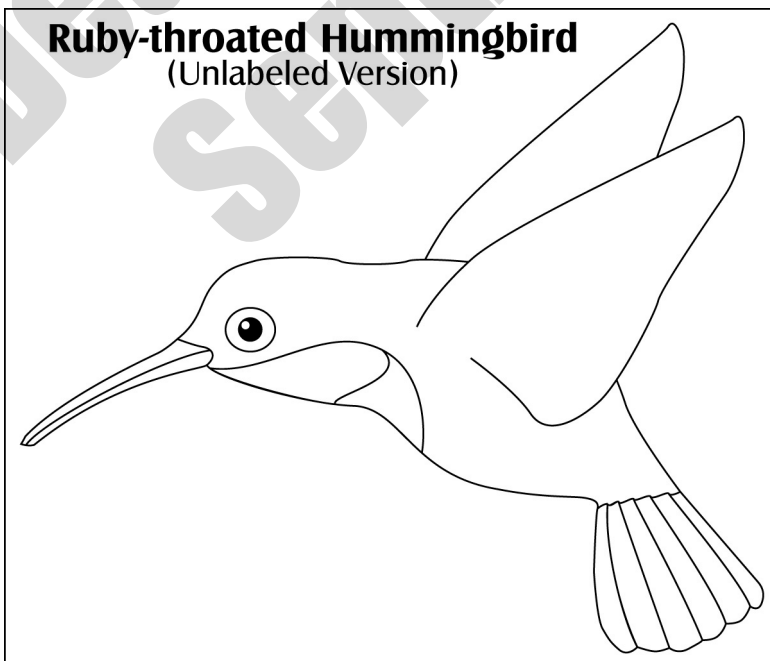
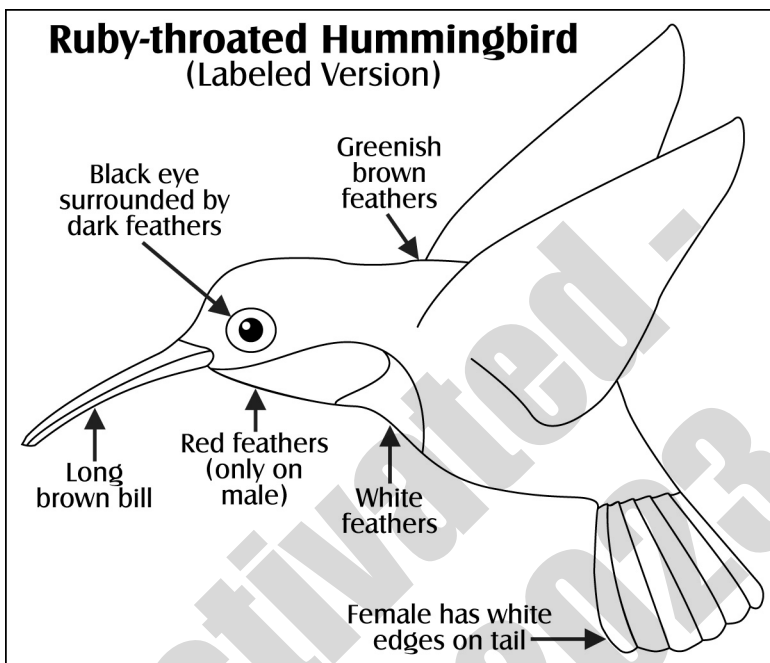
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The Mystery of the Missing Hummingbirds

Honing In On Hummingbirds RTHU Template





Honing In On Hummingbirds Student Fact Sheet



Ruby-throated Hummingbirds (RTHU)

What do they look like?

- They are about 8.5 cm (3.5 in.) long from the tip of the beak to the tip of the tail.
- Adult female birds are larger than adult males.
- Adult males have a red throat, females have a white throat (sometimes with streaks), and juvenile males often have streaks and sometimes a little bit of red on their throats at the end of the summer.

Where do they migrate?

- RTHUs migrate from the eastern United States and Canada to Mexico and Central America in the fall and return in the spring.
- They double their weight in the weeks before they migrate (from approximately 3 grams to 6 grams).
- The hummingbirds fly approximately 40 kilometers per hour (25 miles per hour).
- Their wings beat 60-80 times per second during normal flight (see if you can move your arms that quickly!).
- It takes 20 hours for a RTHU to fly across the Gulf of Mexico – and this is only part of their migration route!

What do they eat?

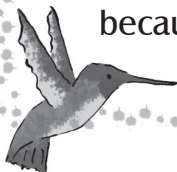
- Each bird eats about its weight in nectar or sugar water each day.
- They eat nectar and small insects.

What are their eggs like?

- RTHU eggs are about the size of a jelly bean (8-13 mm wide).
- The female birds lay the eggs, take care of the eggs in the nest, and raise the chicks once they are born.
- A female ruby-throated hummingbird usually lays two eggs.

Where do they build their nests?

- The hummingbirds build nests in large trees that are near flowering plants because they eat the nectar from flowers.



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The Mystery of the Missing Hummingbirds

Honing In On Hummingbirds Student Activity Sheet

Name _____



What I want to
know about
hummingbirds...

What I learned...

