THE CHILDREN'S MUSEUM AT LA HABRA
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The Art of Flying

Overview

Students will learn how insects' wings operate. Students will then create a model simulating how an insect moves its wings.

Processes/Skills

- Observing
- Hypothesizing
- Using models
- Following directions
- Asking questions

Recommended For: K-2nd grade

Time Required: (30 minutes prep and 45 minutes for the activity)

Materials Required:

- 1 empty paper towel roll per student (or 1 paper towel roll cut in half)
- "Wonderful Wings" and "I Can Fly" handouts (attached)
- Scissor and tape
- Photos of various winged insects (or preserved specimens if available)

Connecting to the Standards

- Language Arts
  - S.L. 1. Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.
  - S.L. 3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
  - SL.1.4. Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
  - SL.1.5. Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.
- Science
  - LS1.A. Structure and Function : All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.

Activity Objectives

- Students will learn how insects' wings operate. Students will then create a model simulating how an insect moves its wings.

Assessment

- Assess student participation in both the initial and concluding class discussions for active involvement and appropriate responses.
- Evaluate how well the students followed either oral or written directions for creating the model.
- Observe students' demonstration of the models they made assessing their understanding of how to make the wings move.

Preparation

1. Because younger students may have difficulty cutting the tubes, prepare ahead of time by cutting the slits as pictured below.

2. Make one copy of the "*Wonderful Wings*" and "*I Can Fly*" handouts for each student.

Activity

1. Distribute the "*Wonderful Wings*" handout to each student. Have students take a few minutes to look carefully at the illustrations of insects. As a class, read the names of the insects and discuss the shape, placement, and pattern of the insects' wings.

2. Place real insect specimens or photos around the classroom. Invite students to look closely at the wings of these insects, paying special attention to the wing structure by using magnifying glasses provide at each bug inspection station.

3. How do students think insects move their wings? Share the ideas on the whiteboard.

4. Some students may suggest that insects have muscles in their wings that move them. Have students stand up and find a muscle in their arm and flex it. Next, have them pretend their arms are wings. As they each lift an arm out to the side, challenge students to feel the muscles that flex to lift the arm. They will discover that the deltoids, the triangular muscles located on the shoulder, are mainly responsible. Ask them if any other parts of their bodies change shape as they lift their arms.

5. Explain that insects don't have muscles in their wings. Most insect wings are made of very thin membranes, thinner than tissue paper. Because they contain no muscles, insect wings do not have the ability to move on their own. The insect's midsection, the thorax, is where the muscles used to move the wings for flight are located. These muscles contract and relax, causing the thorax to change shape as it produces each wing movement.

Making the Model

1. Explain that students will be using cardboard tubes and paper wings to simulate how an insect flies.

2. Distribute the pre-cut cardboard tubes and "*I Can Fly*" activity sheets. Either read the instructions as a class and have students complete one step at a time, or have students read and follow the instructions on their own or in small groups.

3. When the models are completed, have students gently squeeze their tubes to get the wings to move. Ask them which part of their model they think is like an insect's thorax. They may need to experiment with where they position their hands on the tube to get the best wing motion. Students should be squeezing the middle of the tube where the wings are fastened.

4. Ask students to demonstrate the motion for each other. The observing student should be looking at the open end of the tube to see the cross-section. Ask the student who is observing to pay particular attention to how the shape of the thorax changes when the muscles are "flexed" by the other student.

5. Walk around the classroom and have students demonstrate to you the best place to squeeze the tube to achieve the best movement of the wings.

Review

- Conclude the lesson with a class discussion. Refer back to the hypotheses that students offered about wing movement at the beginning of the lesson.

- Ask students the following questions:
  1. What do humans use to move their arms?
  2. Do insects have muscles in their wings to make them move?
  3. Do insects use muscles to move their wings?
  4. Where are those muscles located?

Definitions:

INSECT: A small invertebrate animal that has six legs and one or two pairs of wings.
WINGS: Paired appendages that enable an animal to fly.
THORAX: The middle section of an insect's body bearing its legs and wings.
MUSCLES: Soft tissue in human and animal bodies that produces the force and motion required for movement.
FLEX: To bend a limb or joint.

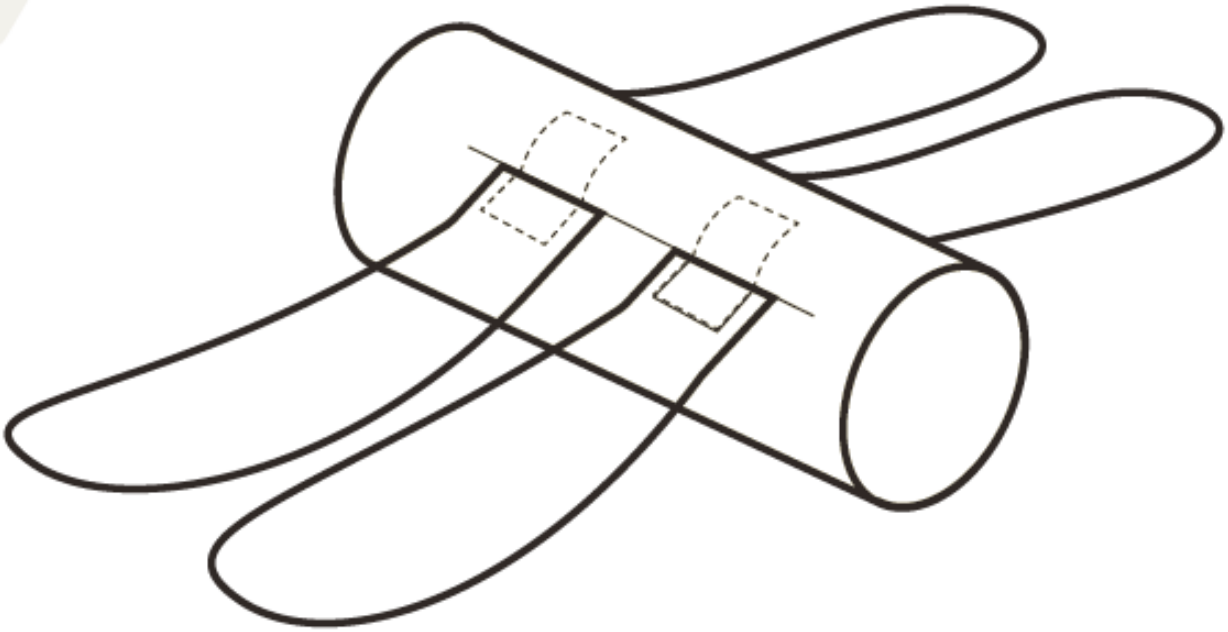
SOURCE:
http://cdn.orkin.com/downloads/learningcenter/lesson-plans/ORKIN_LP_TheArtofFlying.pdf.

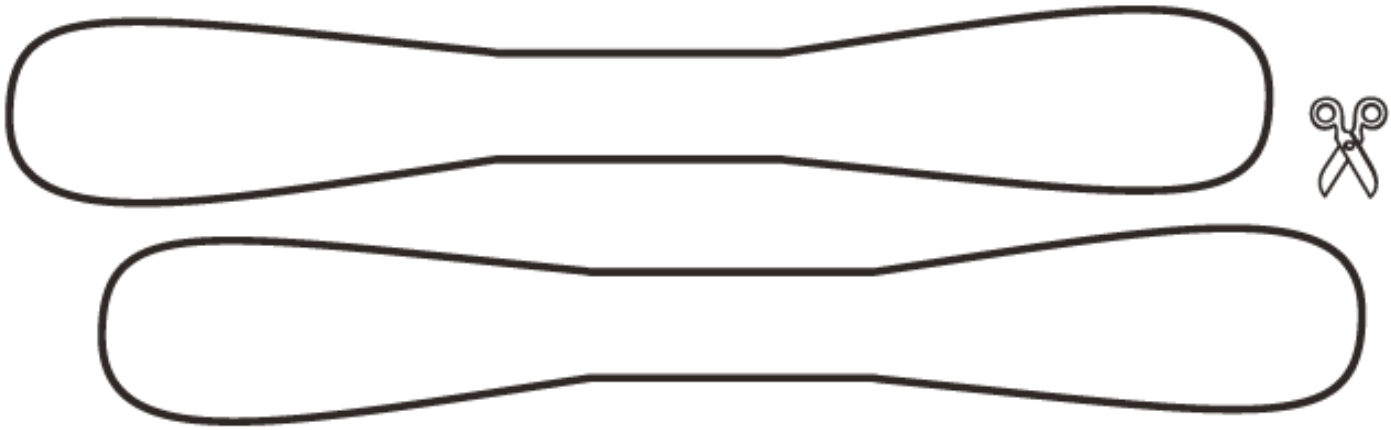
I CAN FLY!

ACTIVITY SHEET

NAME _____

1. Cut out the two airplane propeller shapes below.
2. Slide the wings through the slits in the tube.
3. Put a piece of tape on each side of the tube near the slit to keep the wing from sliding.
4. Squeeze the tube gently to move the wings.

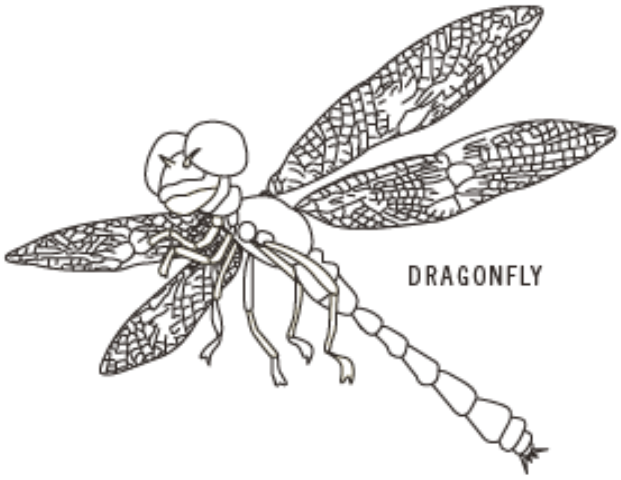




WONDERFUL WINGS

HANDOUT

BUCKEYE BUTTERFLY

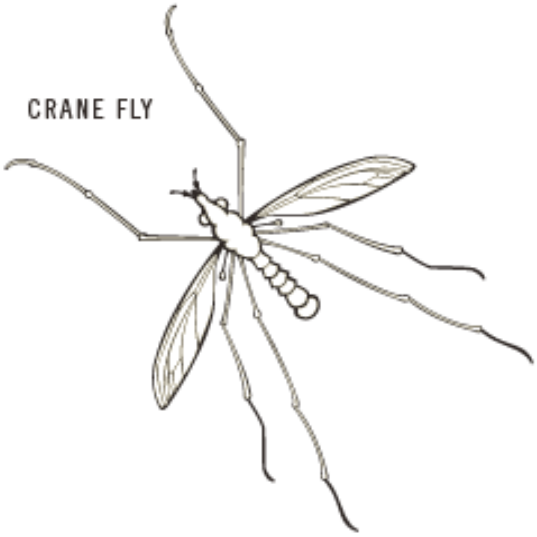


DRAGONFLY

BAND WINGED
GRASSHOPPER

BUMBLEBEE

HORSE FLY



CRANE FLY

MONARCH
BUTTERFLY