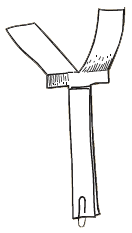
**Twirly Bird Lesson**

**Lesson Overview:**

*In this lesson students explore the motion of a paper toy, a twirly bird. Through making observations and conducting an investigation students learn about the effects of gravity and air resistance on falling objects.*

**Standards:**

1st Grade – Standard 3, Objective 1:

Analyze changes in the movement of nonliving things.

2nd Grade - Standard 3, Objective 1:

Communicate observations about falling objects.

**Materials:**

* 2 twirly birds per student (see attached sheet for template)
* paperclips
* scissors

**Lesson:**

**Engage:**

Provide students with a pre-made twirly bird, or instruct students on how to make a twirly bird by cutting out the template along the solid lines and folding on the dotted lines. Explain to students that the twirly bird is a toy that they are going to use to discover more about how objects fall to the ground.

Tell the students that you want them to make observations of the twirly bird to try to figure out how the twirly bird moves. Give students a few minutes to explore the twirly bird toy. Once students have figured out how to make the twirly bird fall and spin, ask them to share their observations. To help students share provide sentence frames:

*I noticed that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.*

*If I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, then the twirly bird \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.*

**Explore:**

After students have shared, ask them what they could change about the twirly bird to see if it moves differently. List student ideas on the board. Students might suggest cutting the wings, folding the wings, or adding more paperclips. Give each student a second twirly bird and ask them to make one change to the toy. Then model how to release both the original twirly bird and the modified twirly bird to watch them fall at the same time. Let students explore their two twirly birds. Encourage students to observe how the two twirly birds move differently. In science notebooks have students draw a picture of what they did to change the twirly bird.

**Explain:**

Let students share what they did and what they noticed about the modified twirly birds. After students have shared have them turn to a partner and discuss why they think the twirly bird spins as it falls to the ground. Once students have had a chance to share their ideas, introduce the forces affecting the twirly bird: gravity and air, or air resistance. Show students a crumpled piece of paper. Ask them what will happen when you drop the paper. Then drop the paper, and introduce the idea that gravity if a force that pulls objects to Earth. Now show students the crumpled piece of paper and a flat paper. Ask them to predict which will land on the ground first if you drop them from the same height. Drop the two papers and ask students to explain why the flat paper falls more slowly. Explain that air pushes back up on the paper as it falls and slows the paper down. The same forces affect the twirly bird. Gravity pulls the twirly bird down and air pushes back up. When the air pushes on the wings it makes the twirly bird spin. In science notebooks, have students label their pictures of the twirly bird with an arrow pointing down labeled gravity, and an arrow pointing up labeled air.

**Elaborate (optional):**

Show students a picture of a sky diver with a parachute. Ask them to explain how they think a parachute works to slow the sky diver down. Invite students to make their own parachute for a “paperclip” person. Provide students with materials such as paper towels, paper plates, construction paper, tape, string or yarn. After students have created their parachutes have a contest to see which parachute stays in the air the longest after it is dropped. As a class discuss why some parachutes took longer to reach the ground than other parachutes.

**Evaluate:**

Have students answer the following prompt, either orally, or in writing.

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