

2 Spinning Seeds

Build Knowledge

INTRODUCTION

What Students Do in this Activity

In this activity, students briefly examine samaras (dry fruits that form thin, papery wings as they develop) to observe how they travel in the wind. They then explore paper models that spin like the rotors of a helicopter. They build their own paper helicopters, explore how they fly, and compare the way they fly to how samara seeds fly.

Objectives

Students will:

- Build paper helicopters
- Explore how a paper helicopter works

Time

30–40 minutes

Materials

For the teacher:

- 1 maple samara seed
- 1 acorn
- 1 electric fan (optional)
- Model paper helicopter (*see Preparation for the Activity*)
 - 1 copy of **Build a Helicopter, Reproducible Master 4**
 - 1 copy of **Helicopter Template, Reproducible Master 5**
 - 1 paper clip
 - 1 pair of scissors
- Chart paper or whiteboard
- Markers

A-Ha

Spinning seeds and paper helicopters both catch the air and spin when dropped. This motion helps the seeds and the helicopters stay aloft longer. The seeds differ from the helicopters – the helicopters have two rotors while the seeds only have one. They are similar because they both have blades that cause them to spin with a weight that pulls them down.

For the class:

- *Once Upon a Time in the Woods* book

For each team:

- 1 maple samara seed
- 12 paper clips
- 4 pairs of scissors

For each student:

- 1 copy of **Build a Helicopter, Reproducible Master 4**
- 1 copy of **Helicopter Template, Reproducible Master 5**
- 1 copy of **Similarities and Differences, Reproducible Master 6**
- Science notebook (see Introduction, page 25, for more information)

Preparation for the Activity

Using **Build a Helicopter, Reproducible Master 4**, and **Helicopter Template, Reproducible Master 5**, build your own helicopter to be used for demonstrations.

For *Presenting the Activity*, you will need to place an electric fan on a table or desk. You may need to get an extension cord if the circle area is not near an electrical outlet.

For *Facilitating Student Exploration*, student teams will need space where they can build and test their helicopters.

Have the book *Once Upon a Time in the Woods* available for students to consult, as needed.

CLASSROOM ACTIVITY

Presenting the Activity – Whole Group

1. **Gather students for a class discussion.**
Have students sit next to their talk-partners.
2. **Remind students of the seeds they explored in the previous activity.**
Drop your sample maple samara seed and allow it to fall to the ground.
Ask students what they notice about how the seed falls.

Drop it again and ask students to describe the motion they see.



Teacher Tip:

Be sure to address safety with students. Stress the safety rules you want students to follow for this challenge. Or, come up with the rules together as a class.

3. **Ask students to turn and talk with their partners about the following question, “What do you think might be some reasons that the seed spins the way it does?”**

Give students about a minute to discuss and then ask them to share their thoughts with the rest of the group.

Take notes about students’ thoughts on a piece of chart paper or a whiteboard.

4. **Place the fan on a table or desk and turn it on. Drop the maple samara seed in front of it.**

Ask students to describe what they see.

Note

The seed should have flown horizontally while in the path of the fan, moving it in the direction the “wind” was blowing.

Take an acorn and drop it in front of the fan. Ask students to describe what happens to the acorn.

Discuss the differences that students see between how the seeds dropped.

5. **Drop the maple samara seed again and ask students if the motion of the seed reminds them of anything they have seen.**

Ask students to turn and talk about the following question, “How do you think we could build something that flies like this seed?”

Give students a few minutes to discuss how they might make a spinning toy.

Have talk-partners discuss for a few minutes and report back to the class about their discussions.

Keep track of their suggestions on a piece of chart paper or a whiteboard.

If students have not suggested a paper helicopter, explain that you have a model that spins when it flies and that you’d like them to experiment with it. Show students your model paper helicopter.

Facilitating Student Exploration – Teams

6. **Tell students that it is their job to each build a helicopter and fly it, keeping notes about what they observe in their science notebooks.**

Ask students to get into their teams. Give each team of students an area in which they can work.



Teacher Tip:

Refer to the Introduction section (page 24) for ideas on helping students remember previous work if a lengthy period passes between activities.



Teacher Tip:

You may wish to demonstrate how to build a paper helicopter for students.



Teacher Tip:

Have extra copies of Helicopter Template, Reproducible Master 5, available in the event that students make mistakes while cutting and folding.

- 7. **Hand out Build a Helicopter, Reproducible Master 4, and Helicopter Template, Reproducible Master 5, to each team member, along with four pairs of scissors and 12 paper clips for each team.**

Go over the reproducible masters with students.

Explain that students will need to be careful with cutting and folding.

Remind them of the proper procedure for launching the helicopter (by simply dropping it).

- 8. **Give a maple samara seed to each team. Have students explore their helicopters and seeds and note the similarities and differences between them.**

Hand out **Similarities and Differences, Reproducible Master 6**, to students. Go over it with them.

- 9. **Give students 15–20 minutes for their exploration.**

Have students add the reproducible master to their science notebooks after they have finished their investigations.

Discussing and Interpreting - Whole Group

- 10. **Gather students together with their science notebooks to share their observations of the similarities and differences between the seed and the helicopter.**

Make sure that students have noted similarities and differences between the physical forms of the helicopters and the seeds, as well as similarities and differences in their behavior.

- 11. **Discuss the question, “What did you notice about the helicopters when they flew?”**

Record students’ observations on a piece of chart paper or a whiteboard.

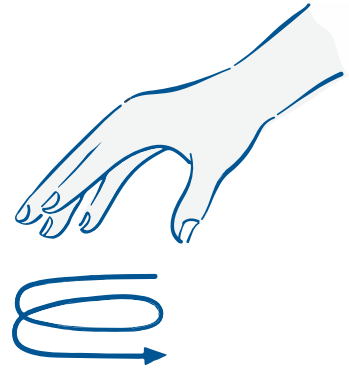
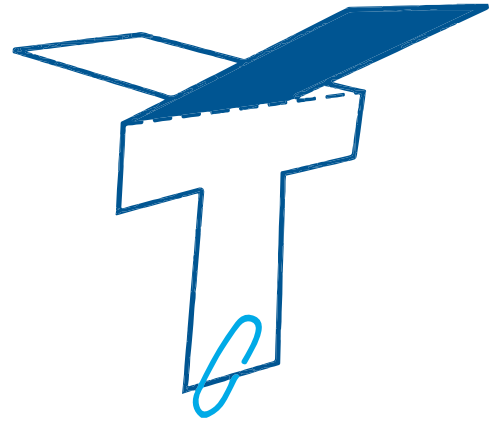


Teacher Tip:

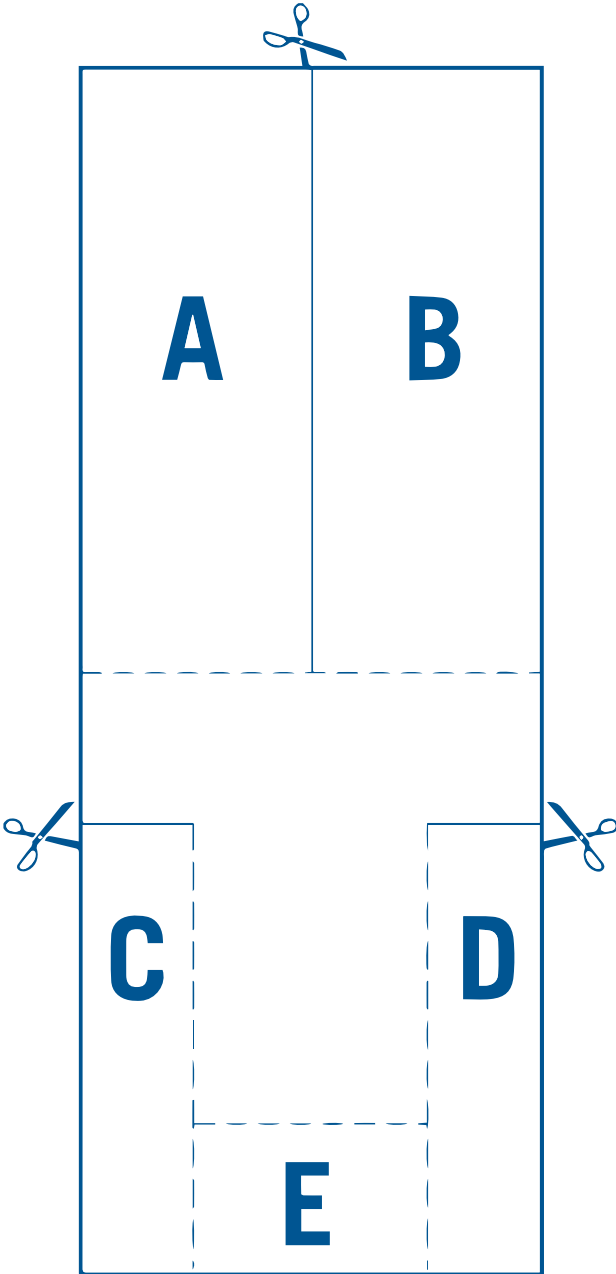
Ask students to be certain their names are on the helicopters then collect them. Their helicopters will be needed in the next activity.

BUILD A HELICOPTER

1. Cut along all the solid lines.
2. Fold flap A forward along the dotted line and flap B back.
3. Fold flaps C and D forward along the dotted lines.
4. Fold flap E upward.
5. Use one paper clip to hold flap E in place.
6. Your helicopter should look like this.
7. Be sure to put your name somewhere on the helicopter.
8. To launch, hold the helicopter by the wings and drop (with the paper clip at the bottom).



HELICOPTER TEMPLATE



SIMILARITIES AND DIFFERENCES

My name: _____

My partner's name: _____

Write about one **similarity** that your team observed between the spinning seed and the helicopter you built. _____

Write about one **difference** that your team observed between the spinning seed and the helicopter you built. _____
