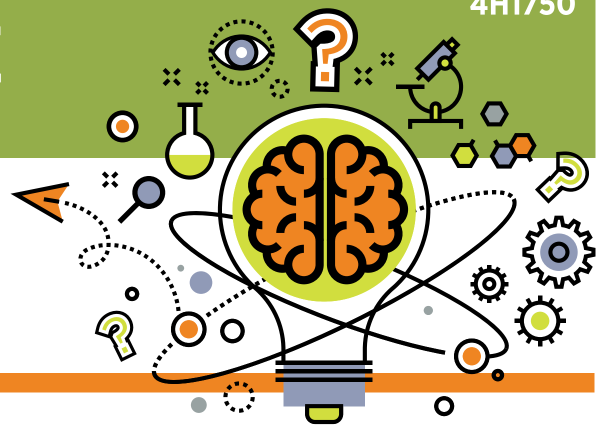
4H1750

# TEACHING SCIENCE

## ...when you don't know diddly-squat



# Does the type of paper make a difference in paper airplanes?

## Purpose:

The purpose is **not** to teach specific content, but to teach the process of science – asking questions and discovering answers. This activity encourages young people to try to figure things out for themselves rather than just read an answer on the internet or in a book. As a leader, try not to express your opinion, but let the youth engage in arguments based on evidence.

## Time required:

20 minutes or multiple days depending on the interest and questions the youth have

## Materials:

- ❏ Tissue paper
- ❏ Cardstock
- ❏ Paper (recycled office paper)
- ❏ Aluminum foil
- ❏ Wax paper
- ❏ Other paper

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### *Science Practice:* Asking questions and defining problems

1. Ask youth, *Does the type of paper make a difference in paper airplanes?* Let them share their answers. Don't share your ideas. After they have given answers, follow up with more questions. *Why or why not? If we are testing the paper type, does the size of the paper matter? Should all the types be the same size? Does it matter if you don't fold each paper into the same style of airplane? How will we know which type of paper works best for distance, resistance to damage, or both?*

### *Science Practice:* Planning and carrying out investigations

2. Allow the youth to prepare their types of paper (all the same size).
3. Then discuss and decide on the type of airplane they will fold.
4. Next, let youth fold and test their airplanes and collect data in a simple data sheet.

**Paper Airplane Paper Results**

| Trial number | Material | Distance | Resistance to damage |
|---|---|---|---|
| | | | |
| | | | |

### *Science Practice:* Developing and using models

5. Youth are designing and building model airplanes.

### *Science Practice:* Analyzing and interpreting data

6. Discuss the results of the airplane testing. *Did the type of paper matter? Did the style of airplane matter? Why? Which type of paper worked best? Why do you think this type of paper worked better than the others?*


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*Science Practice:*
**Using mathematics and computational thinking**

7. If youth collected data, consider combining the data to have a greater number of trials and find the average, median (middle value) and mode (most common value). *Why might this information be important? What are the sequence of events that someone would need to know to repeat your trials?*

*Science Practice:*
**Constructing explanations and designing solutions**

8. Discuss why and how the airplanes flew, focusing on the types of paper.

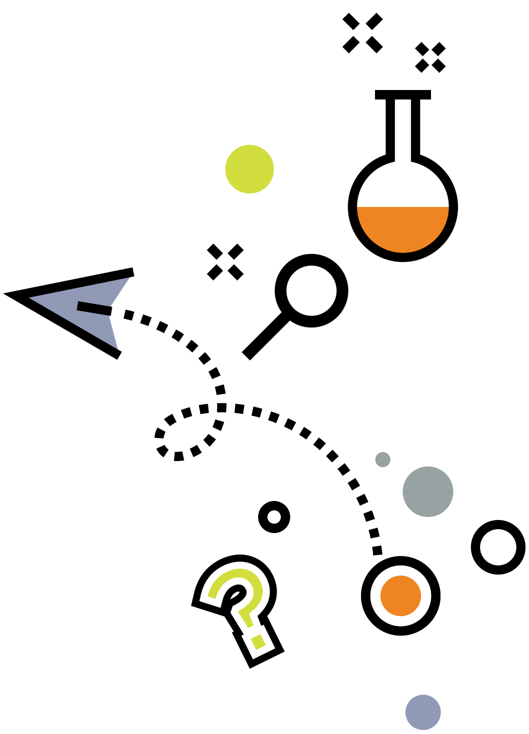
*Science Practice:*
**Engaging in argument from evidence**

9. Let the youth decide which material worked best and explain why, using their evidence. *What is more important, distance or resistance to damage? Why?*

*Science Practice:*
**Obtaining, evaluating, and communicating information**

10. Discuss the types of paper used and the types of airplanes used. (If different models were used, your conversation can be richer.)

You do not need all the answers to teach science. You simply need an inquisitive mind and to be willing to carry out an investigation.



## Other thoughts:

- *Can you think of circumstances when different types of material make a difference in real airplanes?*
- *What would cause a plane to fly further?*
- *Would some designs do better in different weather?*
- *Can you think of times when the material used is important?*

## Science & Engineering Practices:

These eight Science and Engineering Practices come from *A Framework for K–12 Science Education* (National Research Council, 2012, p. 42). These research-based best practices for engaging youth in science are connected to in-school science standards that all children must meet.

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

## Reference:

National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. Washington, DC: National Academies Press.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