



Tested & Approved STEM Activities

WIND STREAMER

Activity Guide



A product of the Science-Technology Activities and Resources for Libraries (STAR_Net) program.
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Developed by the Lunar and Planetary Institute/Universities Space Research Association
September 2015



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WIND STREAMER

Overview

Children create a wind streamer out of common materials and use it to determine the wind's direction.

Type of Program

- ☒ Facilitated hands-on experience
- ☒ Station, presented in combination with related activities
- ☒ Passive program
- ☐ Demonstration by facilitator

Activity Time

15 minutes

Intended Audience

Families or other mixed-age groups, including children as young as 4 years old *with assistance from an older child, teen, or adult*

School-aged children ages 5-7

What's the Point?

- Weather on Earth is always changing, but scientists — and children — can watch and use tools to note the different types of weather.
- Scientists use tools to measure wind direction (in addition to wind speed, temperature, and precipitation).

Facility Needs

- ☐ 3 or more tables
- ☐ Optional: 15–20 chairs arranged at the table(s) for groups or families to sit together
- ☐ An outdoor area that is exposed to any breeze or wind

Materials

For the Facilitator

- ☐ *Brief Facilitation Outline* page
- ☐ 1 navigational compass

For Each Group of 10-15 Children

- ☐ 40-60 meters (45-66 yards) or more of crepe paper, in a variety of colors
- ☐ 10-15 (dinner-size) paper plates

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- ☐ 5-8 copies of the *Wind Streamer Graphic and Instructions* (depicting a compass rose), printed in color or in black and white and cut in half
- ☐ Craft supplies and tools, such as:
 - ☐ Rulers
 - ☐ Glue or tape
 - ☐ Crayons and / or colored pencils
 - ☐ Markers

Supporting Media

Consider setting up a digital media player (such as a computer), speakers, and access to the Internet to display websites or multimedia before, during, or after the activity.

Books

Weather

Mike Goldsmith, Kingfisher, 2014, ISBN: 978-0753471326

Readers lift flaps to discover the answers to weather-related questions. Appropriate for ages 3-6.

Weather

Catriona Clarke, Usborne, 2006, ISBN: 978-0794512538

Surprising facts and rich illustrations make this book an appealing introduction to weather.

There are clear descriptions of the water cycle, clouds, and lightning, as well as sections about weather scientists and how weather affects animals. Appropriate for ages 6-8.

Websites

Weather Wiz Kids

<http://www.weatherwizkids.com/kids-questions.htm>

Answers to questions submitted by children about weather are posted here. Children ages 8 and up, as well as younger children with the help of an adult, may enjoy looking for answers to their own questions on this list. Some examples include “Why does it rain?” and “Why do clouds float?”

Handouts and Visual Aids

Weather Diary

www.naturedetectives.org.uk/download/weather_diary.htm

The large grid layout and images on this simple weather journal may appeal to ages five to eight. Show the children how to note the wind’s direction in their journals.

Preparation

Beginning six months before the activity

- Prepare and distribute publicity materials for programs based on this activity. If possible, build on the children's knowledge by offering multiple science, technology, engineering,

art, and mathematics (STEAM) programs. See the STAR_Net resources listed at <http://community.starnetlibraries.org/resources> for ideas.

- Plan for any introductory activities or extensions that you'd like to incorporate with this activity. Consider using an "icebreaker" activity to help the children get to know each other.
- Plan to provide verbal and / or written instructions for creating a wind streamer.
- For young children, plan to provide assistance with gluing and cutting. Consider allowing extra time for this activity for young children.
- Create a wind streamer to serve as an example for the children to follow, then take it outdoors to prepare to answer the children's questions about using it. Use the navigational compass to identify the north from your location. Orient the wind streamer as described in step three and practice noting the direction of the wind.

The day before the activity

- Print color copies of the *Wind Streamer Graphic and Instructions* and cut them in half. Set them out, along with the crepe paper, paper plates, and craft supplies and tools.
- Place the example wind streamer where everyone can access it.

Activity

1. Share ideas and knowledge.

- Introduce yourself and the library. Help the children learn each other's names (if they don't already).
- Frame the activity with the main message: Weather on Earth is always changing, but scientists — and children — can watch and note the different types of weather.
- Invite the children to talk about what they already know about weather, what they've experienced at home and their ideas for how they might detect or measure it. Use open-ended questions and invite the children to talk with you and each other.

Young children have built an understanding of weather through direct experiences with wind, clouds, rain and snow, and heat and cold. Use discussion to help them start to think about these prior experiences and build new understandings about the tools that scientists use to understand wind (and more broadly, changes in weather). Some conversation-starters are:

- What is today's weather like?
- What would be the opposite type of weather? What other kinds of weather are there?
- How does the weather affect what you do every day?
- Do you think that today's weather "normal" for this season?
- What do you think the weather will be like tomorrow and why?
- What kinds of weather instruments have you seen at your home or in the community? Does your family have a wind vane or wind chime at home? A thermometer? A rain gauge?

- 2. Guide the children in building a wind streamer.** Explain that scientists use tools to detect the wind's direction and the children will be making their own tool, a wind streamer, to use at home. Have the children follow these steps:
- a.** Color the wind graphic and cut it out along the black circle.
 - b.** Prepare the plate, **starting with the bottom, flat side:**
 - i.** Draw a large, straight cross through the center of the bottom side of the plate.
 - ii.** At each of the four ends of the cross, and about 1.5 cm (less than an inch) from the edge of the plate, cut a small hole.
 - iii.** Cut four crepe paper streamers, each measuring about 1 meter (or about the length of a child's outstretched arms) in length.
 - iv.** Thread each streamer through a different hole and tie it to the edge of the plate.
 - c.** Glue or tape the colored wind graphic on the bottom of the plate so that the compass rose lines up with the cross. Glue or tape the instructions onto the plate for easy reference by an adult helper or parent at home.

The children may have ideas about what causes wind, including that clouds or trees cause the wind. For young children, it is important that they observe wind, rather than try to explain or model where it comes from.

Older children and parents may be interested in a deeper explanation. Wind is simply air molecules in motion. The Sun's light heats Earth's surface, and that heat is passed to air touching the ground. The warm air becomes less dense and rises. As cold air moves in to replace the rising air, we feel wind.

- 3. Demonstrate how the children will use their new tools at home!** Hold the example wind streamer horizontally in front of you, so that the plate is parallel to the ground. Grasp the edge of the plate near the letter "S" and turn to face north so that the "N" on the wind streamer is pointing to the north. Demonstrate that the wind will push the streamers toward one of the cardinal directions noted on the plate. Remind the children that they may have heard weather forecasters on television say that "the wind is blowing out of the north." Emphasize that a wind blowing *from* the north blows the crepe paper to the south.

The cardinal directions marked on the face of the wind streamer may lead some to refer to it as a "compass." The wind streamer is more like a wind sock or wind vane than a compass! Gently guide children and their families toward the use of "wind streamer" (or another related term) instead of "compass" to avoid confusion. (A compass needle is a tiny magnet, and the north or south pole of the needle line up with Earth's magnetic field.) The wind streamer will not help them find North — but it will help them determine the wind's direction!

- 4. Conclude.** Summarize that we can detect and measure the ever-changing weather with weather instruments. Encourage the children to take their creations home with them and use

them to note changes in weather over the course of a day, a week, or a season. Invite them to return to share their findings with you.

Correlation to Standards

National Science Education Standards

Grades K-4

Earth and Space Science - Content Standard D

Changes in the Earth and Sky

- Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.

Science and Technology – Content Standard E

Understandings About Science and Technology

- Tools help scientists make better observations, measurements, and equipment for investigations. They help scientists see, measure, and do things that they could not otherwise see, measure, and do.

Extensions

If desired, expand this activity to include other weather tools. Find instructions and materials lists at websites such as:

- **Rain Gauge**, National Wildlife Federation
www.nwf.org/Kids/Your-Big-Backyard/Fun/Outdoors/Science/Rain-Gauge.aspx

Explore wind even further through projects such as:

- **Wind Turbine Tech Challenge**, STAR_Net
<http://community.starnetlibraries.org/resources>
Participants build a model wind turbine, then explore and test common materials to identify a modification that would enable their model to better catch the wind.
- **4-H Grab and Go: Kites**, University of Illinois
<http://howtosmile.org/record/3442>
This instruction sheet describes how to fold a kite and then modify the design to help the kite fly better. For younger children, provide pre-folded kites for them to decorate and fly.

References

Make a Wind Streamer, Miami Museum of Science

“Weather Unit,” American Geological Institute

www.k5geosource.org/2activities/1invest/weather/index.html#wcll

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Brief Facilitation Outline

1. Share ideas and knowledge.

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- Frame the activity with the main message: Weather on Earth is always changing, but scientists — and children — can watch and note the different types of weather.
- Invite the children to talk about what they already know about weather, what they've experienced at home and their ideas for how they might detect or measure it. Use open-ended questions and invite the children to talk with you and each other.

2. Guide the children in building a wind streamer. Explain that they will be making one kind of instrument, a wind streamer, for detecting the wind's direction. Have the children follow these steps:

- a. Color the wind graphic and cut it out along the black circle.
- b. Prepare the plate, **starting with the bottom, flat side:**
 - i. Draw a large, straight cross through the center of the bottom side of the plate.
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4. Conclude. Summarize that we can detect and measure the ever-changing weather with weather instruments. Encourage the children to take their creations home with them and use them to note changes in weather over the course of a day, a week, or a season. Invite them to return to share their findings with you.

Activity Materials to Print

Point this side toward the north



Hold here

Measure the Wind's Direction!

1. Go outside on a breezy day.
2. Hold the wind streamer out flat in front of you.
3. Hold the edge of the plate near the letter "S" and turn to face north so that the "N" on the wind streamer is pointing to the north.
4. Watch the wind push the streamers! Note the cardinal direction that is opposite the direction that the streamers are pointing. For example, a wind blowing *from* the north blows the streamers to the south.

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