



MISSION POSSIBLE

IMAGINE. DESIGN. CREATE.

LET'S READ

Find a comfortable spot and read! Here are some ideas to get you started:

- *Wind* by Honor Head
- *Into the Wind: Sailboats* by Steven Otfinoski
- *We Need Directions!* by Sarah De Capua
- *Wind and Storms* by Robyn Hardyman

You can download digital copies of these books for free from openlibrary.org. Here is how!

MISSION : Watch the Wind

Your mission is to design and build an instrument that will tell you what direction the wind is blowing!

WHAT YOU'LL NEED

- A compass (phone app, GPS or a physical compass)
- A piece of string, yarn or toilet paper at least 12 inches long
- Recycled material from around your house (paper, straws, sticks, cardboard, string, aluminum foil, cloth, plastic bag or anything else you think will work)
- Tape (scotch tape, duct tape or masking tape)
- Optional: something to write with and paper to draw on



1. Go to openlibrary.org.
2. Click the blue "sign up" button on the top right to create a free account. You will be sent a confirmation email.
3. Sign in.
4. Type the book title and author into the search bar.
5. Find your book and click the blue "borrow" button.
6. Don't forget to return your book when you are finished reading it!



Sam Noble Home



Get Started:

- 1) Pick the area where you are going to work (bathtub, driveway, etc.).
- 1) On a day where there is at least a light wind, go outside and feel the wind blowing for a few minutes. What do you observe?
- 2) Use the compass to determine where north, south, east and west are. (If you need help using a compass, check out this video:
 <https://www.youtube.com/watch?v=LroX6ThIDpw>)
- 3) Hold the string of yarn or toilet paper in the blowing wind and observe how the wind moves it. Use the compass to figure out in which direction the wind is blowing the string.
- 4) Pick the area where you are going to work and gather the supplies.
- 5) Look at the supplies and the compass:

THINK!

- How can your instrument show which way the wind is blowing?
- How can you use the materials you collected to build it?
- How can you use the compass to help show what direction the wind is blowing?
- Where will you place it outside?
- Will you need any other materials?
- Optional: Draw what you want your instrument to look like!

6) Build it!

- 7) Once you have built your instrument, place it where it will be in the wind and see what happens.

WHAT HAPPENED?

- Was the wind strong enough to move your instrument?
- Did your instrument tell you what direction the wind was blowing?
- Did your instrument move in the wind at all?

- 8) Try again! Just because your idea didn't work the first time, doesn't mean you should give up. Think about how you can change your idea to build your instrument in a different way so that it will be able to better move with the wind. Be creative and try as many times as you want. Ask an adult or partner for ideas if you've tried all of yours, or check out the next page if you need some hints.



When you're done, share what you did with someone!

TELL THEM

- Did your instrument work on the first try?
- How did you change your design to better move with the wind?
- How many ideas did you try?
- What was hard about the challenge?
- If they wanted to try this challenge, what should they do?

BONUS CHALLENGE

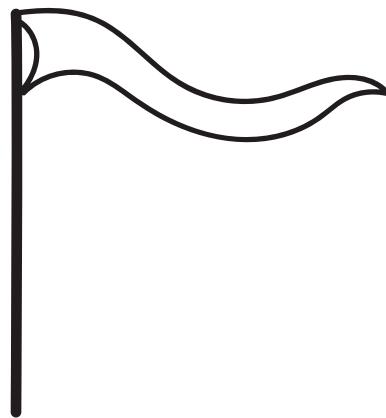
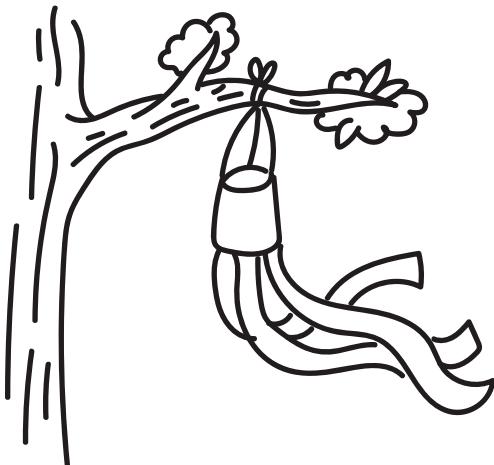
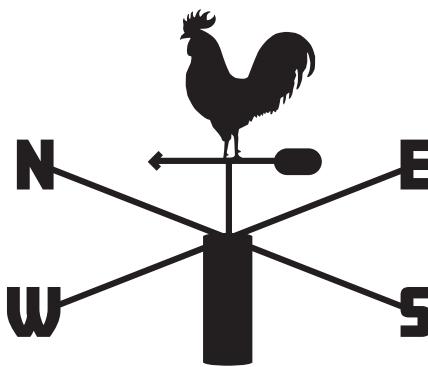
Now that you've built your instrument, see if you can:

- Build an instrument small enough to carry around with you.
- Build an instrument that you can leave outside (it might need to be stronger, larger or even waterproof).
- Use your instrument to track the wind every day for one week. Write down what you observe, and see if you can find any patterns.

Whether it's strong enough to form a tornado or as gentle as a breeze, wind is all around us! Wind, or moving air, is an important part of our everyday lives. Wind is a part of the weather, or the conditions in the atmosphere around the Earth. Scientists can determine what the weather is, or is going to be, by watching the strength and direction of the wind. Strong winds might tell us a storm is coming, while gentle or even no wind can mean it's going to be a clear day.

While we use wind to help us understand the weather, people have also used wind for power and travel. Wind turbines use the wind to turn their blades and make electricity, while sailboats use their large sails to help the wind push or pull them in the right direction. People also put instruments called weathervanes on their homes to tell them which direction the wind is blowing. Turbines, sailboats and weathervanes all have a similar design that helps them use the wind. Each is made of a moveable part (something like a blade, sail or arrow that can move with the wind) connected to a stable (non-moving) part to prevent it from flying off.

If you need some inspiration, check out some design ideas below:



TIPS

- Your instrument needs a part that can move with the wind while still being attached to something, so it won't blow away.
- The part that moves with the wind should be light.
- Not sure where to start? Try pinning a straw into the eraser of a pencil and building your instrument around it.
- Putting the cardinal directions on your instrument may make it easier to tell which direction it is moving. You can attach a piece of paper to the unmoving part of your instrument and label it.
- All wind conditions are important, so don't be discouraged if some days there is only light wind or even no wind at all.

HELPFUL WORDS

Breeze: a gentle wind

Cardinal directions: the directions north, south, east and west

Compass: an instrument that shows something's position in relation to cardinal directions

Direction: the line along which something moves or faces

Gale: a strong wind

Instrument: a tool designed with a specific purpose or job

Natural resource: something from the earth that we can use

Weather: the conditions of the atmosphere (layers of gas) around the Earth

Weathervane: an instrument that shows the direction of the wind

Wind: moving air

Talk like an wind instrument engineer!

1. Engineers design and use instruments like weathervanes and compasses.
2. Weathervanes are instruments that show the direction of the wind.
3. I can use my instrument to see in which cardinal direction the wind is moving.
4. My instrument can help me observe the conditions of the weather.
5. A breeze might move my instrument slightly, while a gale could move it a lot.

Want to learn more about the challenge? Check out the links below:



Where Does Wind Come From? (video)

<https://www.youtube.com/watch?v=0yXC45dgmSs>



Wind Direction and Speed (video)

<https://www.youtube.com/watch?v=SqbTrbxWT1o>



Oklahoma Mesonet:

<http://mesonet.org/>



National Weather Service

<https://forecast.weather.gov>



How Does a Compass Work?

<https://www.livescience.com/32732-how-does-a-compass-work.html>