

Wild Wind

What Is This Activity?

How does wind flow through a city?

Families use bubbles to observe wind speed and direction, and to test how buildings and streets affect wind flow.



pbskids.org/plumlanding/parents

Curriculum Topics

weather, human impact

Activity Type

outdoor (all weather—warm or cold days—as long as there's some wind)

Group Size

whole group, working in pairs, small groups

Activity Time

40–60 minutes

Materials

- Two colorful ribbons or chalk (to mark start and finish lines)
- Timer or watch
- “How Fast Is Today’s Wind?” handout (one per family)
- Bubbles and wand (one per person)
- “Wind Spinner” handout (one per family)
- “Wind Spinner Template” (one per person)
- String (one per person), scissors (shared)
- Wind Spinner for demonstration (see “Wind Spinner” handout)
- Optional: Crayons or markers to decorate Wind Spinners
- Optional: “Explore Weather Around You” handout

Next Generation Science Standards

Disciplinary Core Ideas

ESS2.D: Weather and Climate

ESS2.E: Biogeology

ESS3.C: Human Impacts on Earth Systems

Science and Engineering Practices

Asking Questions and Defining Problems
Using Mathematics and Computational Thinking
Planning and Carrying Out Investigations
Obtaining, Evaluating, and Communicating Information
Analyzing and Interpreting Data
Constructing Explanations and Designing Solutions

Crosscutting Concepts

Patterns

Cause and Effect: Mechanism and Prediction

Scale, Proportion, and Quantity

Learning Goals

Big Science Idea:

- City structures change the direction and speed of wind. We can observe wind direction and speed by the wind’s impact on bubbles, leaves, and other objects.

Skills kids will use to investigate it:

- Predict, observe, measure, and discuss wind speed and direction and its impact on objects
- Use observations to make a decision about the best place to hold a bubble contest
- Observe and communicate how city structures block wind, channel it, or create drafts

How Do You Get Ready?

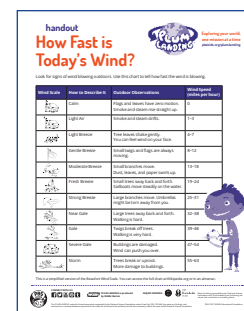
- Read the activity and gather the materials.
- Make at least one Wind Spinner using the “Wind Spinner Template” and following the directions on the “Wind Spinner” handout.
- Print copies of the “How Fast Is Today’s Wind” handout and “Wind Spinner” handout and template for families. You may want to make extra copies of the template for families take home.
- Scout out a suitable open area near buildings: a park, schoolyard, or basketball court, for example.
- Mark off a distance of 10 meters (about 30 feet) in your outdoor space (for the warm-up) with the ribbons or chalk.
- Troubleshoot safety concerns (traffic, poison ivy, sharp objects, etc.).
- If you don’t plan to show “The Manta Ray Mystery” video that is paired with this activity on the website, watch it ahead of time and jot down concepts to share with families during the activity

Warm-up (8-10 minutes)

(Science Skills: Predict, observe, measure, and discuss wind speed and its impact on objects)

Run Like the Wind?

- 1. Discuss:** Can you run faster than the wind can blow? Can the world's fastest person?
- 2. Time kids and adults as they race the 10-meter distance you marked.**
- 3. Explain** that the world's fastest runners cover that distance in less than one second! How do the times of kids and their families compare? (Two seconds for the kids would be excellent. Very fast kids run roughly 8 to 12 miles per hour.) Olympic record holders run nearly 28 mph.
- 4. Ask:** Can the wind blow faster than 28 mph? **Have the families predict:** What's the fastest that wind can blow? What would a super-fast wind feel like? What could it do to objects? Tell families they will revisit their predictions later.
- 5. Hand out the chart "How Fast Is Today's Wind?" Review the art on the handout or read it aloud to families. Ask:** What kind of wind blows 28 mph? What can a "strong breeze" do to a tree? (Move large branches.)
- 6. Encourage everyone to look for and point out signs of wind flow:** Moving leaves, swaying branches, a waving flag, rattling street signs, blowing hair, swirling dust or papers, etc. Have families use those observations and the chart to tell how fast the wind is blowing today.



Activity

Follow the Wind (15-20 minutes)

(Science Skills: Predict, observe, and compare the speed and direction of wind and its impact on objects; use observations to make a decision)

- 1. Ask:** Wind is invisible, so how do you know it's there?
- 2. Have everyone copy your actions as you turn around slowly in place. Ask:** Can you feel wind on your face? Can you tell which direction it is blowing?
- 3. Hand out the bubbles to families. Ask kids to predict:** How far and in what direction will the bubbles travel? Why do you think so? Make sure they give reasons for their predictions, such as: "There's almost no wind, so the bubbles won't go far."
- 4. Give families five to 10 minutes to openly explore how and where the wind blows the bubbles.** Have families blow bubbles in all directions: Downwind, upwind, crosswind, straight up, and any other way they can think of! Tell them to just let the bubbles drift and not to pop them.
- 5. As they explore, ask the kids:** Is wind blowing in the same direction everywhere? At the same speed? Where's the windiest spot?
- 6. Ask:** Which locations will make the bubbles travel the farthest if we have a bubble contest?
- 7. Hold the bubble contest:**
 - Choose a suggested location.

- Ask participants to find a partner and pair up.
 - Have all pairs line up behind a starting line.
 - One member of the pair blows the bubbles while the other member runs alongside the bubbles and stands where the farthest bubble lands or pops.
- 8. The winner is the pair that is farthest apart. Ask:** *Is there a better starting spot, with stronger or steadier wind?* Have families choose their own starting places and repeat the bubble race.

Repeat as many times as desired.

For older or more mature children: Add tougher contest challenges, such as keeping a bubble from hitting the ground as long as possible or landing a bubble on a target spot by choosing a strategic launch point and then waving arms and blowing to steer it.

Windy City (15–20 minutes)

(Science Skills: Observe how city structures block wind, channel it, or create drafts)

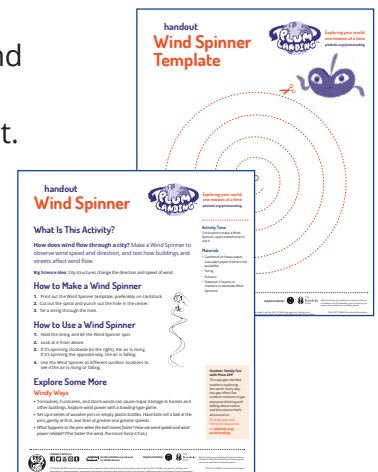
- 1. Ask kids to share their experiences with wind.**
- 2. Explain that buildings block the wind, but they can also channel it or make it flow faster down a narrow street.** Kids might have observed this change in speed in a stream or river, where narrow parts move faster and wider parts move slower.
- 3. Discuss:** *Have you seen paper or leaves rise up into the air on a hot day? What might cause that?* Explain that when a street heats up, the hot air rises rapidly. That's called an updraft. (Look for birds circling high above—gliding on updrafts to save energy.) A downdraft is cooler air that is falling.
- 4. Demonstrate how to use the Wind Spinner.** Have a volunteer **look at the spinner from above.** Which way is it twirling? If clockwise (to the right), the air is rising; if counterclockwise, it is falling.
- 5. Give families copies of the Wind Spinner handout** (one for each person) and review it with them. Give them scissors and have them make spinners. If you have time, have families decorate their Wind Spinners before cutting them out.
- 6. Encourage them to search for updrafts and downdrafts** near buildings and water fountains, over hot pavement, in shaded areas, etc.
- 7. Move from family to family and offer support and encouragement.**

Updrafts are currents of fast-rising hot air. They are common in cities with tall buildings and narrow streets.

Wrap-up (5–10 minutes)

(Science Skills: Communicate how city structures block wind, channel it, or create drafts.)

- **Wonder aloud:** *How fast was the wind today? How fast can wind blow? Is there a “top speed”? What kind of damage could super-fast wind do?* Revisit kids' speed predictions if you did the warm-up. (Tornadoes generate the fastest measured wind speeds, at just over 300 miles per hour, and can lift locomotives off of train tracks, for example.)
- **For fun,** have everyone pretend that they are trying to walk in the face of a super-fast wind.
- **Ask:** *What are ways that buildings affect wind flow in a city?* (Block it, channel it, create updrafts and downdrafts, make wind swirl in circles.) Explain that the wind can make very tall buildings sway like trees!



- Give families additional copies of the “Wind Spinner” template to repeat the activity in their neighborhoods. Encourage them to take home the “How Fast Is the Wind?” handout to check the wind speed every day. Finally, give them the “Explore Weather Around You” handout to provide them with more ideas on how to continue investigating weather together.

Explore Some More

DIY Wind Scale (Beaufort)

Think about wind as a group to come up with a “Wind Feel Scale” from 1 to 10. For example, a “1” could mean you feel no wind at all, a “2” could mean a soft touch on your skin, a “3” could mean your hair moves, and so on. How would families describe the strongest winds on the scale?

VISIT pbskids.org/plumlanding/parents to find more activities, games, and videos.



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handout

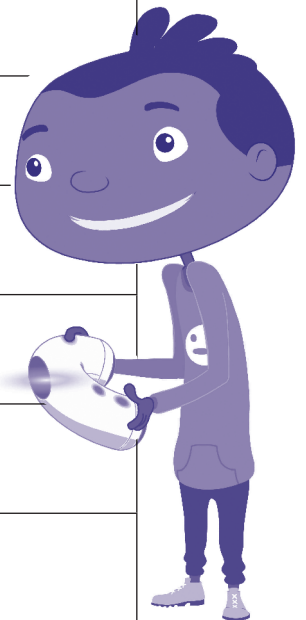
How Fast is Today's Wind?



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Look for signs of wind blowing outdoors. Use this chart to tell how fast the wind is blowing.

Wind Scale	How to Describe It	Outdoor Observations	Wind Speed (miles per hour)
	Calm	Flags and leaves have zero motion. Smoke and steam rise straight up.	0
	Light Air	Smoke and steam drifts.	1-3
	Light Breeze	Tree leaves shake gently. You can feel wind on your face.	4-7
	Gentle Breeze	Small twigs and flags are always moving.	8-12
	Moderate Breeze	Small branches move. Dust, leaves, and paper swirl up.	13-18
	Fresh Breeze	Small trees sway back and forth. Sailboats move steadily on the water.	19-24
	Strong Breeze	Large branches move. Umbrellas might be torn away from you.	25-31
	Near Gale	Large trees sway back and forth. Walking is hard.	32-38
	Gale	Twigs break off trees. Walking is very hard.	39-46
	Severe Gale	Buildings are damaged. Wind can push you over.	47-54
	Storm	Trees break or uproot. More damage to buildings.	55-63



This is a simplified version of the Beaufort Wind Scale. You can access the full chart at Wikipedia.org or in an almanac.



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Wind Spinner



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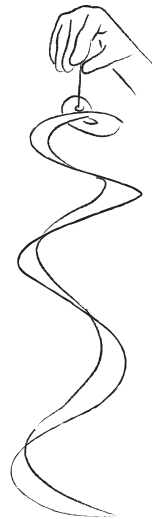
What Is This Activity?

How does wind flow through a city? Make a Wind Spinner to observe wind speed and direction, and test how buildings and streets affect wind flow.

Big Science Idea: City structures change the direction and speed of wind.

How to Make a Wind Spinner

1. Print out the Wind Spinner template, preferably on cardstock.
2. Cut out the spiral and punch out the hole in the center.
3. Tie a string through the hole.



How to Use a Wind Spinner

1. Hold the string and let the Wind Spinner spin.
2. Look at it from above.
3. If it's spinning clockwise (to the right), the air is rising. If it's spinning the opposite way, the air is falling.
4. Use the Wind Spinner at different outdoor locations to see if the air is rising or falling.

Explore Some More

Windy Ways

- Tornadoes, hurricanes, and storm winds can cause major damage to homes and other buildings. Explore wind power with a bowling-type game.
- Set up a series of wooden pins or empty plastic bottles. Have kids roll a ball at the pins, gently at first, and then at greater and greater speeds.
- *What happens to the pins when the ball moves faster? How are wind speed and wind power related?* (The faster the wind, the more force it has.)

Activity Time

5 minutes to make a Wind Spinner, open-ended time to use it

Materials

- Cardstock or heavy paper (use plain paper if others not available)
- String
- Scissors
- Optional: Crayons or markers to decorate Wind Spinners

Outdoor Family Fun with Plum APP

This app gets families outdoors exploring the world. Every day, the app offers five outdoor missions to get everyone thinking and talking about nature and the science that's all around us.

Find the app and more fun resources on pbskids.org/plumlanding.



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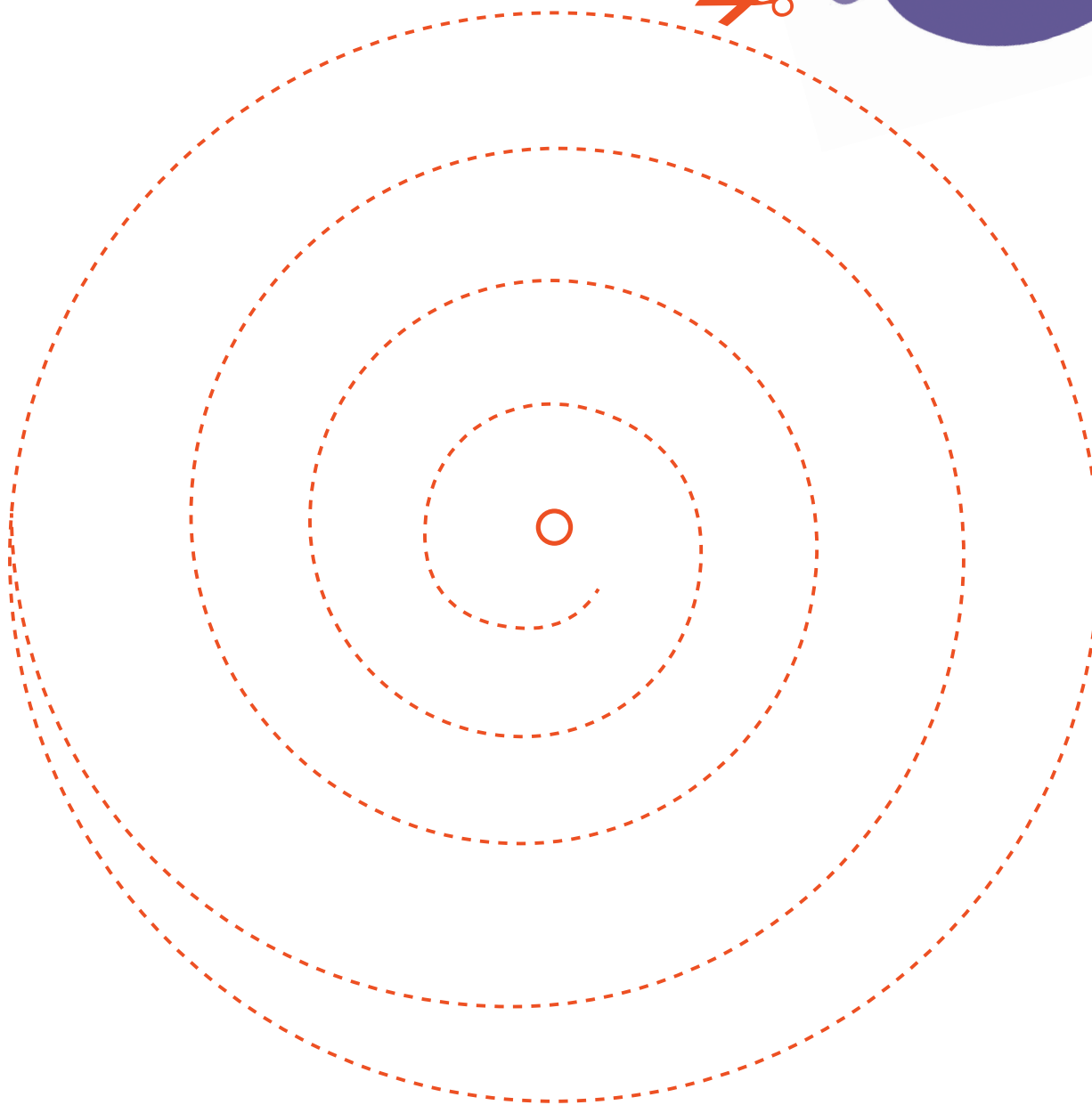
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Wind Spinner Template



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¿A qué velocidad sopla el viento hoy?



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Busquen los indicios del viento al aire libre. Usen la tabla siguiente para describir la velocidad del viento.

Escala de viento	Cómo describirlo	Observaciones al aire libre	Velocidad (millas por hora)
	Calma	Las banderas y las hojas de los árboles tienen cero movimiento. El humo y el vapor suben en dirección perfectamente vertical.	0
	Aire leve	El humo y el vapor se desplazan a la deriva.	1 a 3
	Brisa leve	Las hojas del árbol se agitan levemente. El viento se siente en la cara.	4 a 7
	Brisa suave	Las ramitas más pequeñas se mueven en todo momento.	8 a 12
	Brisa moderada	Las ramas más pequeñas se mueven. El polvo y los papeles se arremolinan.	13 a 18
	Brisa fresca	Los árboles más pequeños se mecen.	19 a 24
	Brisa fuerte	Se mueven las ramas más grandes.	25 a 31
	Conato de vendaval	Los árboles más grandes se mecen. Es difícil caminar.	32 a 38
	Vendaval	Las ramitas se desprenden del árbol. Es muy difícil caminar.	39 a 46
	Vendaval fuerte	Los edificios quedan dañados. El viento puede hacerte caer.	47 a 54
	Tormenta	Los árboles se quiebran o sus raíces se desprenden de la tierra. Más daños a los edificios.	55 a 63



Esta es una versión simplificada de la escala Beaufort de la velocidad del viento. Se puede acceder al cuadro completo en Wikipedia.org o en un almanaque.



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Girador eólico



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¿De qué trata esta actividad?

¿Cómo sopla el viento por la ciudad? Hagan un Girador eólico (impulsado por el viento) para observar la velocidad y dirección del viento, y para ver cómo los edificios y las calles afectan el viento.

Megaconcepto científico: Las estructuras de la ciudad cambian la dirección y la velocidad del viento.

Cómo se hace un Girador eólico

1. Imprima la plantilla para el Girador eólico preferiblemente en cartulina.
2. Recorte el espiral y perforo un agujero en el centro.
3. Pase el hilo por el agujero perforado y hágale un nudo.

Cómo se usa el Girador eólico

1. Sujete el hilo y deje que el Girador gire.
2. Obsérvelo desde arriba.
3. Si gira como las manecillas del reloj (hacia la derecha), el aire está en ascenso. Si gira en el sentido opuesto, el aire está cayendo.
4. Use el Girador eólico en diferentes lugares al aire libre para ver si el aire está ascendiendo (subiendo) o descendiendo (bajando).



Exploremos más

Vientos imparables

- Los tornados, huracanes y vendavales pueden causar daños enormes a hogares y otros edificios. Explore la potencia del viento con un juego parecido al boliche.
- Coloquen una serie de palos de madera o botellas plásticas. Pídale a los niños que rueden una pelota hacia ellos, primero suavemente, y luego a mayores y mayores velocidades.
- *¿Qué pasa con los palos cuando la bola se desplaza más rápidamente? ¿Qué relación hay entre la velocidad del viento y su potencia? (Cuánto más rápido el viento, mayor su fuerza).*

Duración de la actividad

5 minutos para hacer el Girador eólico, el tiempo que se quiera dedicar a usarlo

Materiales

- Cartulina o papel grueso (si no lo hay, usen papel común y corriente)
- Hilo
- Tijeras
- Opcional: Crayolas o marcadores para decorar los Giradores eólicos

Diversiones familiares al aire libre con el app de Plum

Este app invita a las familias a salir al aire libre a explorar el mundo. Cada día, el app ofrece cinco misiones al aire libre que ponen a todos a pensar sobre la naturaleza y las ciencias que tenemos a nuestro alrededor. Disponible en inglés solamente.

Encuentren el app y más recursos divertidos en:
pbskids.org/plum.



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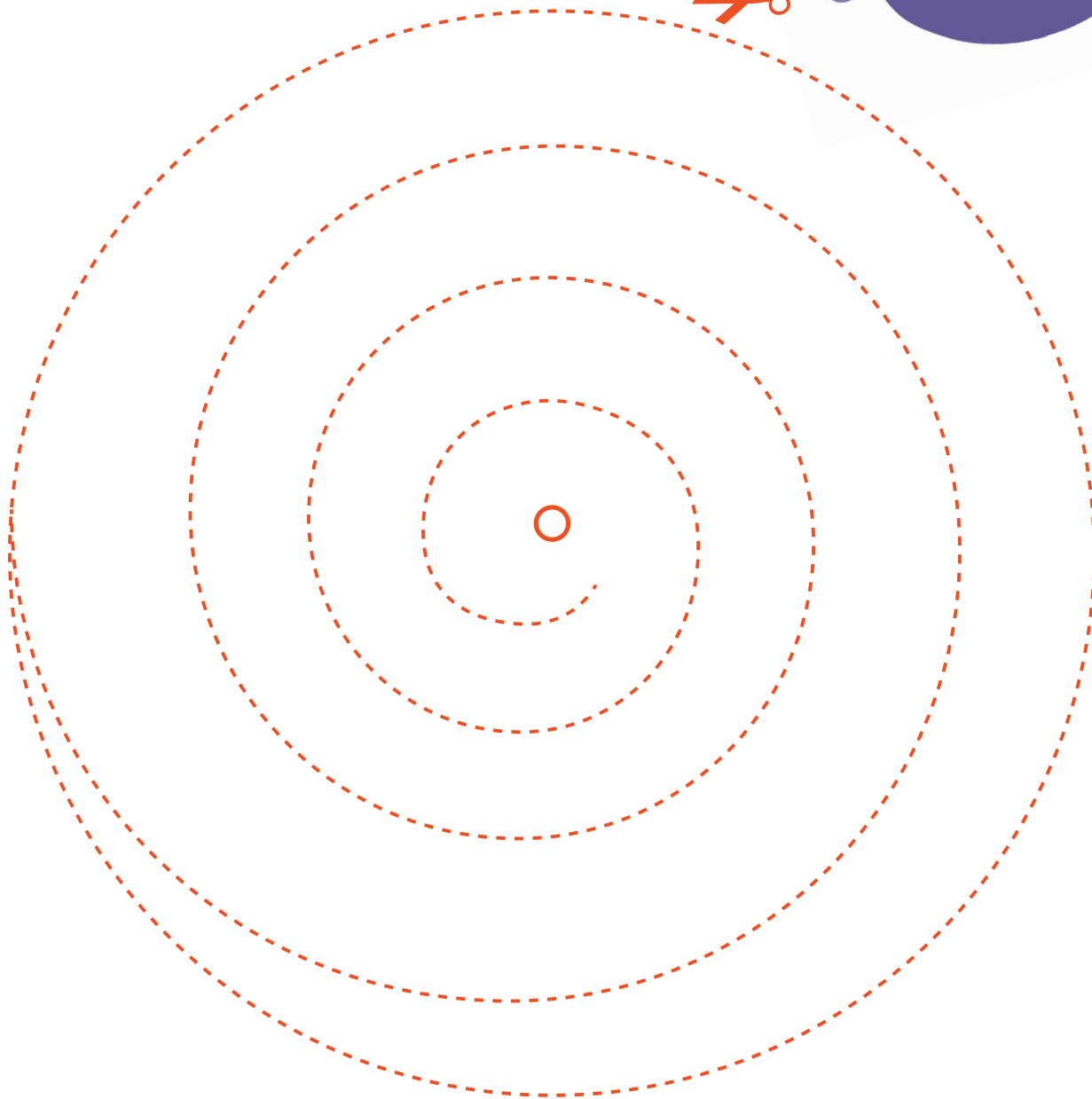
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Plantilla para hacer un Girador eólico



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