

Conifer Conundrum

Discover the hidden talents of pine cone scales

Collect

- Three pine cones
- Permanent marker
- String
- Ruler
- Paper and pencil
- Oven
- Baking tray
- Aluminum foil
- Bowl
- Water
- Ice



Set up the experiment.

1. With adult supervision, preheat the oven to 250 degrees Fahrenheit.
2. Label each pine cone with a permanent marker: cone A, B, and C.
3. Measure the length of the cones by using the string to measure from the bottom to the top of each. Hold the section of string against the ruler. Record your results.
4. Measure the circumference of the cones by using the string to measure around the widest part of each pine cone. Hold the measurement against the ruler. Record your results.

Experiment time!

5. Cover the baking tray with aluminum foil. Place pine cone A on the tray.
6. Place the tray in the oven and heat for 45 minutes, checking every ten minutes to make sure that the cone isn't burning.
7. While pine cone A is in the oven, fill a bowl with water and a handful of ice cubes. Place pine cone B in the bowl of water.
8. Allow pine cone C to sit in the open air. This will be your control.

Did they change?

9. After 45 minutes, carefully remove the pine cone from the oven and from the bowl of icy water.
10. Take length and circumference measurements for the three pine cones.
11. Which pine cone changed the most? Which one changed the least?

How does it work?

Pine cones are filled with small seeds. The cone's scales act like armor to protect the seeds inside from cold and damp winters. When the temperature drops or when rain starts to fall, the scales of the pine cones close up tight, keeping the seeds safe and dry inside. When the weather is warm and perfect for the seeds to grow, the scales open up and allow the dry seeds to fly away on the wind to grow into new pine trees.

Even if the pine cone has already released its seeds, it still opens and closes its scales depending on the temperature and humidity around it. Dry weather makes the outer half of each scale shrink more than the inside of the scale. When wet, the scales will swell and shut again even if it no longer has seeds to protect.

Take it further

- Switch places! Place pine cone A into the bath of icy water and pine cone B in the oven. What changes do you observe?
- What other environments can you think of? Try placing a pine cone in a bathroom after a steamy shower or bath to test warm wet environments, or in a freezer to test what happens in cold air.