Experimenting with Pinecones

Have you ever noticed that pinecones are either tightly closed or wide open? Why?

The pinecone on the right was collected under a non-native black pine (*Pinus nigra*) in early October. All the pinecones that day looked like it.

The pinecone on the left was collected a week later from under the same tree, with the same group of cones as the week before, but now all the cones looked like it. Why?

Then after 3 hours on the kitchen counter, the one on the left look like this. Why?

They were put on the back porch, undercover, and they both changed again. Why?

Then they got wet in a windy, rainy storm. What do you think happened?

Let's find out!

Materials:

- 2 cones of the same kind and about the same size
- 2 clear jars or cups (glass or plastic)
- Water
- Ruler

Directions Part 1: Just for fun, if the cones are open, tap them on a flat, hard surface. Seeds should fall out. See how small seeds at the end are, compared to the "wing."

1. Fill 1 jar with tap water.
2. Take an open cone and place it in the jar of water.
3. Take the other cone and place it in the empty jar about 1 foot away from the other jar.
4. Leave them there overnight.
5. The next day, observe each cone. What happened?

Part 2:

6. Take both cones out of the jar. Set them next to each other.
7. Monitor how long it takes for the two to look the same again.
8. Once they are the same, measure the opening between scales, and record this.
9. Now take them outside but under cover for a day.
10. Check on the cones after a day. Measure the opening between scales. Keep monitoring for a week
11. Do see a pattern? What's it like outside each day? What's going on?

What did you discover?

Change the variables. Try hot water in a jar, or set one out in the rain and the other under cover, etc.

Why do you think conifer cones have adapted to act this way? Hint: remember the "naked seed."

A good STEM question would be, **how** do cones actually accomplish this?

Scientists and engineers think they have figured this out. They are trying to imitate the process and adapt it to solve a need in society. The book, *From Pinecones to Cool Clothing* by Toney Allman, might interest you.