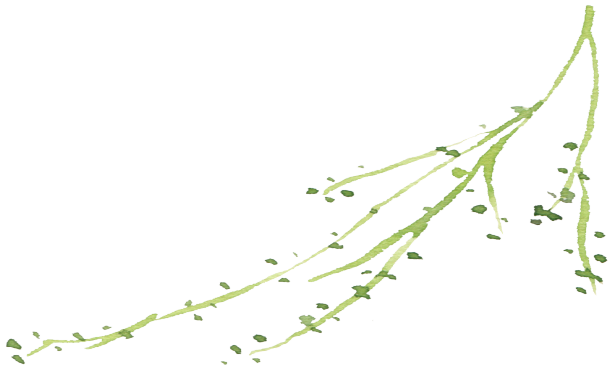
The Secrets of the Pine Cone Activity

For this week's Learning Together Tuesday we'll be finding out all about how pine cones work! Pine cones are really great for dog toys and for decorating, but they have other uses too! Have you ever observed a pine cone on a rainy day and then seen the same pine cone on a sunny day? Here's a hint…they don't look the same!



What are "Pine Cones"?

Let's start off by talking about two types of trees: Angiosperms and Gymnosperms. **Angiosperms** are trees that have seeds that grow in fruit. Anything that does not have fruit is called a **Gymnosperm**. Gymnosperms have "naked" seeds or seeds that are exposed. Some gymnosperm trees have cones which help protect the naked seeds. These trees are known as **conifers**.

We tend to call all tree cones "pine cones," but pine cones are only those that come from pine trees! Tree cones or conifer cones include pine cones, spruce cones, fir cones, and many more cones from conifer trees!

Today, we'll be working with pine cones. Pine cones are an important part of an **ecosystem** as they provide food for lots of animals, such as squirrels, woodpeckers and, millions of years ago, maybe even dinosaurs! But the main role of a cone is to help the tree **reproduce**! Did you know that some pine cones are female, and others are male? They both have different roles: **Female pine cones** produce and protect the seeds of the tree. They are the ones that we think of when we hear the word "pine cone"; they are big, brown, and scaley. You may never have even noticed male pine cones! They are softer, smaller and less distinctive; the **male pine cones** produce **pollen** (the substance that causes plants to form seeds). The pine cones that we will be experimenting with are female pine cones. Female pine cones are not alive but they can still move! The scales of the female pine cone open and close based on different environmental conditions, and today we will be finding out why! Let's get started!

Why do Pine Cones Open and Close?

For the best results, perform this experiment on a **warm sunny day**.

Materials**:**

- 3 glass containers (glass is not essential, but the containers must be transparent)
- 3 pine cones that are opened (their "scales" should be spread out, not tightly wrapped shut)
- Hot and cold water

Method:

1. Start by putting your three glasses on a table or another flat surface. Fill one glass with cold water, one glass with hot water, and leave the last one empty.
2. Put a pine cone in each glass and observe what happens (the process happens **slowly** but within an hour, you should start to see some change).
3. After you notice a change, you can switch around what pine cone you put in each glass to see how that affects the pine cones.

Discussion:

Observe your pine cones. What seems to be happening? Your pine cones should be changing shape! The pine cones in the cold water should be **contracting** (tightly closing their scales). The pine cones in the hot water should be contracting as well but not as quickly, and those in the container of air should be **expanding** (opening their scales) as they dry off. Why do you think this is happening?

Remember, we said that female pine cones, such as the ones we are using, protect their seeds. Well, the pine cones will close and open based on the humidity and temperature outside! In cold or damp weather, pine cones contract and fold their scales to *prevent* seeds from spreading. In dry or warm weather, the seeds have a better chance of being dispersed and surviving, so the pine cones expand and open their scales at the *best time* for the seeds to be dispersed! Isn't it cool that pine cones know to spread their seeds only in the best environmental conditions? We humans aren't the only ones who like sunny days!

Take a look at the results we had from placing a pine cone outside in the sun versus in cold water!

We hope you enjoyed this week's activity! Share your results with us on Facebook or email! Until next week, stay curious!