**Tree Seeds**

*Prepared by Julietta Sorensen Kass* | 60-70 min |

**OVERVIEW**

**Description**

Participants will listen to a story about a magical woman who cares for the seeds of all the trees. Participants will also learn about how trees grow from seeds to adults and look for examples of trees at different ages in their area.

**Learning Outcomes**

* Recognize trees as living individuals, rather than inanimate objects
* Learn about the growth of trees and how it compares with human growth

**Outline**

1. Outdoor Story Time (5-10 min)
	1. Read “Miss Maple’s Seeds”, by Eliza Wheeler
2. Reflect (5 min)
	1. What are seeds? What do they grow into?
3. Match the seed. Activity (15-20 min)
4. How seeds wake-up. Activity (10 min)
5. How old do they get? Activity (10-15 min)

**MATERIALS**

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| **Item** | **Quantity per participant** |
|  Book, Miss Maple’s Seeds (Eliza Wheeler) | 1 book for group |
| Sample seeds(e.g. oak acorns, maple racemes, horse chestnuts, birch catkins, pinecones) | 4+ different seed examples for group |
| Magnifying glasses  | 1 (or 1 per pair) |
| Pens AND pencils | 1 pen/pencil |
| Tree cookies / tree slices | 8-12 tree slices for group |
| Rulers | 1(or 1 per pair) |

\*NOTE!\* Do NOT let participants eat the seeds. Horse chestnuts can make you sick!

**KEY INFORMATION**

* Become familiar with the identification of trees in the area to the genus level. Use Appendix A to correctly match the seeds with their trees. Make sure your location has at least some of the trees listed on the “Matching Tree Seeds” pages in the journal (pages 6-8 and 21-23)
* Procure tree cookies/disks ahead of time. Some companies will give rough and unevenly-cut slices away for free (local arborists, for example). If this does not work, you can easily purchase several disks for under 30$ online.

**LESSON PLAN & PROCEDURE**

**Outline**

1. Outdoor Story Time (15 min)
2. Read “Miss Maple’s Seeds”, by Eliza Wheeler
	* Make a circle somewhere outdoors, near trees
	* Before reading, show participants the story cover
	* Ask participants to guess what the story is about, based on the title and cover
	* Read the story out loud to the group
3. Reflect (5 min)
	1. Discuss as a group
	* Were there any seeds in the story they recognized? Which ones, where have you seen them before? If you found a lost seed, where would you plant it?
4. Match the seed game (15-20 min)
	1. Explanation (2-5 min)
	* What the activity will be, where the boundary is, where we can get clues to answer the question
	* See explanation below
	1. Game (10-15 min)
	* Tree tour and guessing
	* Answers
5. How seeds wake-up. Active demonstration (10 min)
	1. Explain the activity, see explanation below
	2. Act it out! Repeat if desired (See directions below)
6. How old do they get? (20 min)
	1. Background information (See explanation below)
	* Discuss how trees grow differently than people
	1. Tree-cookie activity

**ACTIVITIES**

**3. Match the seed**

\*\*Situate your group in an area which has most of the trees shown in the journal document (pages 21-23)\*\*

Participants will try to find trees in the area whose seeds match the ones shown in the journal. A few seeds have the names written under them in Miss Maple’s Seeds book, so participants can use that as a springboard. Encourage them to look for clues. What kind of seeds do coniferous trees usually have? Are there seeds you often see in your backyard? What kind of tree was it from?

Participants can work in small groups or alone, to fill in the names of the trees that match the seeds in their journal. Lead participants to different trees in the area. Focus on genus rather than specific species. It may not be possible to find examples of trees in each of the genera, but try to hit as many of the following as possible:

Maple

Linden

Chestnut

Oak

Pine

Ash

Spruce

Birch

At each tree, indicate which genus it is in. Participants then write in pencil, the tree-name beside the seed-picture they think matches it (page 6-8). Spend some time making observations of the tree and discussing why participants matched seeds with certain trees. Check the branches of each tree, and around it on the ground, for signs of seeds. Do all trees produce their seeds at the same time of year? (No!) Why not? (Predator avoidance, some species need to hibernate over the winter and will sprout next spring, some trees make fewer larger seeds and have to invest more eagerly into them, some only release seeds following a fire etc.) Who might eat these seeds? Look at the size of the seed for clues!

Spend a few minutes at the end showing participants which seeds actually come from which tree. There are answers near the back of the journal (page 21-23). Give them a chance to correct their answers and now write them in pen. Were they surprised? How on earth did the trees grow from such small seeds?

**4. How seeds wake up**

We are going to transform and become a seed, all of us together. Before starting, refer to the “How Seeds Sprout” page in their journals (page 5). Depending on the number of participants in your group, assign participants to the following roles:

Seed coat (3+)

Stored food (1+)

Cotyledon (baby leaf) (2)

Shoot (stem) (2+)

Roots (1+)

Start with the two baby-leaf participants. Have them stand, in the “middle” of the group. They will each put one hand on a shoulder of the first stem-person, who stands in front of them, to create an open triangle. Then call up the first root-person. They will step into the triangle with their back to the first stem-person. The stem person will then link arms with another stem person (or more!), creating a chain leading away from the leaves. On either side of the stem chain, have one or more stored-food people join in. The stand with their back to the stem-chain, holding their arms out in a circle shape, to show all the food they store. We’re getting there! Now go back to the middle again. Ask the first root-person to link arms with any other root-people. Everyone needs to be nice and snug together. Lastly, have the seed-coat-people hold hands and form a circle around the rest of the participants. We now have a seed! Everyone close and comfy!?!

Next, act out pouring water on the seed and pretend to be a warm ray of sunshine. Have fun with it. Be theatrical! With this new water and sun, the seed-coat people will create an opening (by releasing a set of hands) near the last stem-person. Now it gets tricky. The stem people need to pull the leaf people out of the seed, without detaching themselves! What you’ll do then, is the last stem-person will hold onto a seedcoat-person, and all the other stem-people will grow (walk) out of the seed, pulling the leaf-people with them. You’ll notice that this creates a sort of hook shape coming out of the seed. That’s exactly how little sprouts start, with hooks!

Now the roots can come out! It’s easier for them. They just extend their arms and pass through another opening, created by the seedcoat-people, and stretch out as far as they can without letting go of anyone. But wait there’s more! Al this activity has required energy and FOOD. So the stored-food people should now shrink down or squat to show that they are small now. Why? Because their resources are used up as the seed grows! Once the baby leaves are out of the seed-coat, help the stem-people stretch out tall and encourage the baby-leaf-people to unfold and collect the sun.

This is how a seed wakes up! More complicated than you thought? Join the club!

**5. How old do they get?**

“Trees grow differently than people. While we grow a lot when we are young, after a while, we stop. Otherwise your parents would keep getting taller and taller, and your grandparents would be huge! Trees on the other hand, grow a little bit every year. That’s why we can see how old they are by looking at tree cookies. A tree cookie is a section of a tree taken from the trunk, that shows you the growth rings from its entire life. The circle in the middle is from it’s very first year. Every year around it is another year of growth.

 How can you tell how old a tree is? Can you look at a big tree and guess its age? Can you measure how tall it is? Nope, the only way to know for sure is to look at tree rings. If you don’t want to cut down the tree, another thing you could do is take a core sample. This is where you drill a small hole into the tree, the size of a straw, and pull out a long tube of wood. Then you count the rings along the tube. You only have to drill to the middle of the tree, because the other side is the same!

Today we’ll be looking at tree cookies. Pass out the wooden discs so that each set of partners has one. Each pair should also have a magnifying glass. “Are all the rings the same size?” Participants should notice that the rings are not perfect, some are skinny, and some are much thicker. Though it is possible for them to all be about the same size, it is not at all likely. “Why do they think that is? Trees grow as much as they can with what they are given. They can’t move to find more water or sunlight, or to get away from plants that might be competing for minerals and nutrients in the soil. They’re stuck. So, if it is a dry year, or there are lots of trees growing together, or a new tree is planted beside it and shades our tree, it will have thin rings. That’s a rough year. But if it gets more water, or there is no competition, or a big shade-tree falls or is cut down, our tree will have thick rings. Are older trees always bigger? Let’s find out!”

Invite participants to measure the width across the centre of their disk (the diameter), and then use the magnifying glass to find out how old it is. They can record this information in their journal on the “Measuring Tree Cookies” page (page 10). Have them repeat this several times, with new cookies. At the end, ask the question again, are older trees always bigger? The answer is no, but whether they come to this conclusion will depend on the unique tree cookies you have.. A tree living in poor conditions can grow for a very long time but will not be very large. Ask around for who has the oldest tree, and who has the youngest.

“What is the oldest tree in the world? We actually don’t know for sure, because we have never tested all the trees in the world! But we have found some that are pretty darn old. What do you think the oldest one was? One hundred years old? Three hundred? Well, one tree named “Methuselah” is almost 5000 years old! And still growing!!! It is a Bristlecone Pine, a tree known for growing very slowly but living a long time. Trees like this don’t really get *old* the way we do. Unless a parasite or disease attacks it, or it is damaged in some way, the tree will just keep growing. And we have no idea how long that could be for.

**Debrief**

● Now that we’ve seen the beginning and end of a tree’s life, you may be wondering *how* the tree made all those rings. Don’t worry, we’ll cover that in another lesson (“How Trees Grow”). But it’s amazing to think that every tree you see started from one of these tiny seeds.

**REFERENCES & RESOURCES**

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