



# Fall Favorites Homeschool Lesson Plan

## Raddish Lesson Plan Road Map

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We design these lessons to be adaptable and flexible to your students and your life. You can do A Little Taste in ~45 minutes, or you can use the extension activities and make the projects and activities listed last over several lessons or even weeks. The lessons are meant to be interdisciplinary, covering many subject areas at once. Students of all ages can use these materials, with learners who are pre-writers able to draw or verbally share responses.

If desired, you could extend these lessons into a project-based learning unit of study, where students tackle a real world problem and create solutions. The learning happens in the process of getting to the presentation of the solution, and students often find it more meaningful when they are investigating a topic of their choice.

For a deeper look at the topic, A Big Bite offers extension ideas for learners who are able to read, write, and think on a higher level.

We always love to see your finished projects! You can share them in our Facebook group, [The Raddish Table](#), or email us [hello@raddishkids.com](mailto:hello@raddishkids.com).

**Driving Questions:** What exactly is a pumpkin, and how does it grow?

## A Little Taste

### Resource List

#### Background Information (also linked within lesson)

- Are Pumpkins a Fruit?! Pumpkin Facts for Kids, video from <https://www.youtube.com/watch?v=vLFtV4RI4Lg>
- 8 Cool Facts About Pumpkins, video from Cooking with Abbey, <https://www.youtube.com/watch?v=pTrriu7ivHI>
- *Pumpkin Jack*, picture book by Will Hubbell, <https://bookshop.org/books/pumpkin-jack/9780807566664>
- *Pumpkin Jack* Fall Books, video read aloud by Toadstools and Fairy Dust, [https://www.youtube.com/watch?v=O7i3d46\\_8xM](https://www.youtube.com/watch?v=O7i3d46_8xM)
- “Giant Pumpkins Grow Fast”, news article from The Milwaukee Journal Sentinel, <https://newsela.com/read/giant-pumpkins/id/5655/>
- How to Grow Pumpkins in Containers from Seed | Easy Planting Guide, video tutorial from Toward Garden, <https://www.youtube.com/watch?v=-5NIFrh5QDI>
- *Life Cycle of a Pumpkin*, picture book by Ron Fridell and Patricia Walsh, <https://www.amazon.com/Pumpkin-Life-Cycle/dp/143292544X>
- *Life Cycle of a Pumpkin*, video read-aloud by TMO Learning Journey, <https://www.youtube.com/watch?v=9xc7I1punaV8>
- Pumpkin Growth Time-Lapse: from the seed to the mature fruit in 108 days and nights, video from Garden for Climate, <https://www.youtube.com/watch?v=ytMpE6fubSQ>

#### Optional Extensions

- Virtual Field Trip: Pumpkin Patch, video from Mrs. Christmas, <https://www.youtube.com/watch?v=jsD7zUzaTZ0>
- Permaculture for Kids, article from Permaculture Northern Beaches, <https://www.permaculturenorthernbeaches.org.au/permaculture-for-kids>
- Children in Permaculture - a CIP short film, video from Children Permaculture, <https://www.youtube.com/watch?v=0gOlaGBNWIk>
- 12 Best Veggies & Herbs to Regrow from Kitchen Scraps, blog post from A Piece of Rainbow, <https://www.apieceofrainbow.com/vegetables-herbs-regrow-kitchen-scraps/>
- *How Many Seeds in a Pumpkin?*, picture book by Margaret McNamara, <https://bookshop.org/books/how-many-seeds-in-a-pumpkin-mr-tiffin-s-classroom-series/9780375840142>

- *How Many Seeds in a Pumpkin?*, video read-aloud

<https://www.rif.org/literacy-central/material/how-many-seeds-pumpkin-read-aloud-video>

*\*Special Supply note: This lesson requires pumpkin seeds, potting soil, and small containers for growing\**

### Conceptual Knowledge - What Do You Want Them to Know?

1. Pumpkins are a fruit that sprout from seeds. They flower, and then the pumpkins grow from the flower.
2. Many things can be started from seeds in your house, then transferred outside so they can grow larger and produce fruit and/or flowers.

### Key Vocabulary

- germinate - to start or cause to grow; to sprout
- carotenoids - pigments in plants that produce bright yellow, red, and orange colors
- fruit - the usually edible part of a plant that contains seeds and is often, but not always, sweet

### Cross-Curricular Links

- English Language Arts, Science, Math

### Project Idea/Scenario

Students will start growing a pumpkin from seed, and track its progress to learn how this fruit grows.

### Plan the Process: What Will the Students Do?

Students will learn how the pumpkin fruit is produced and its different varieties, then test how to best get seeds to sprout. They will use the experience to create a final project that showcases their new knowledge around growing from seeds.

### Warm-up Activity - Activating Background Knowledge

- Ask: What is the difference between a fruit and a vegetable?
- Start by naming fruits and vegetables, and write them down into two columns.
  - Are there any that you are having trouble placing in one column or another?
  - What are the attributes of fruits and vegetables? Try to come up with specific identifying characteristics for the ones on your lists.
  - Do you need to change any of the items on your list now based on these qualities? Or does everything still fit?
  - Have you added pumpkins to your list? Which column would they go into?
- Watch [this video](#) to learn more about the pumpkin, and see if you were right about it being a fruit or a vegetable.
- Based on the definition of fruits (refer to the key vocabulary from the top of the lesson for a concise definition), do you need to change any of your columns one last time?

- For today, we are going to do a deeper exploration of pumpkins, and specifically learn how they grow.

### Sequence/Procedure

1. [Read](#) or [listen to the picture book](#) *Pumpkin Jack*.
  - a. While reading, count how many changes the pumpkin goes through over the course of the story.
  - b. How long do you think it takes for all the changes to take place? What seasons do you see Jack go through?
2. Tim accidentally grew a pumpkin from Jack, but most times people grow something from seeds intentionally. To try this at home, you will need to gather seeds, soil, and small containers.
  - a. You can use seeds from a pack, or seeds from a pumpkin you have purchased and scooped out. If you collect seeds from a pumpkin, you will need to rinse them off and clean them a bit to prepare them for planting.
  - b. You can use disposable cups, leftover plastic planters, or any other small containers for the first planting.
  - c. Soil can be from your own garden or yard if you have one, or, in a pinch, you can also germinate seeds on a damp paper towel.
3. [Read](#) or [watch the video read aloud](#) for the book *Life Cycle of a Pumpkin*, and [browse the article about giant pumpkins](#).
  - a. What size pumpkin do you think might sprout from your seeds? Based on the seed packet or pumpkin where you found your seeds, do you think a pumpkin of the same variety would grow? Do you think you have enough time or space to see it grow from seed to pumpkin?
    - i. For this activity you can sprout a seed inside your house. If you would like to transfer the plant so it can grow larger, make a plan for how and where you can try to do that now.
4. Choose a project idea from the list now. (If you elect to create a photo journal it would likely be helpful to start taking photos of the planting process.)
5. Plant your seeds. [Use this video](#) for tips and an informal guide to get you started. If you have enough seeds, you can also try planting and placing them in different places in your house to compare results.
  - a. Consider trying to find areas that are warmer, more humid, or get more sun. There are also studies that have shown playing music for plants helps them to grow; think about what you would like to test for and position your seeds accordingly.
  - b. If you are testing for different variables, make sure to label your plants (i.e. “Seeds with more sunlight, drier climate” and “Seeds with music, more water”).
6. Make predictions about your pumpkin seeds and growth on the handout, found on page 9 of the lesson plan.
7. Using the handout, track, measure, and record your seeds’ growth over the next week. While you are waiting, [watch this time lapse video](#) showing pumpkins growing, or [this one](#) with additional cool pumpkin facts.

- a. Consider if you can expect similar results based on the environment shown in the video versus the environment where you are growing your seeds.
8. Share the finished project (or whatever stage you might be on that can be shared!) while enjoying any of the recipes from the Fall Favorites kit.

### Possible Creations

1. Make a “how to grow” guide for your region. Write out clear, simple steps so that someone can find pumpkin seeds, decide where to grow them in their house, and what needs to be done everyday to get them to sprout. If you were able to start seeds in your house in multiple locations under different conditions, include the details on the best possible location that is likely to encourage the most growth.
2. Transfer the sprouts outside/test out different amounts of water, sunlight, etc. This project will obviously take much longer to complete, but you can make predictions about the timeline and what you expect to happen at different months and seasons. If you were able to test out different areas of your house for planting seeds, see if you can also transfer these seeds to slightly different areas outside and track the growth of the pumpkin plants in areas that get more or less sun, water, or soil nutrients.
3. Create a photo journal that shows the growth from seed to sprout. Label the photos with measurements including sprout height and what day you noted each stage. Include any details that might be specific to your sprout, like amounts of water given and times of day you checked on it.

### Extensions

1. Pumpkins are grown all around the world (with the exception of Antarctica), but pumpkin patches are largely an American creation. Think about pumpkin patches you have visited, and check out this video of a [virtual field trip to a pumpkin farm](#). What features would you include if you were going to design your own pumpkin patch? Draw a map that identifies all your pumpkin patch elements, including the name of your farm and other important details that visitors would want to know.
2. Permaculture, or the growth of agricultural ecosystems in a self-sufficient and sustainable way, is a concept that many farmers are embracing and using in growing fruits and vegetables today. [Watch this video](#) about introducing kids to permaculture concepts, and also [read about the main principles of permaculture](#). What principles would work with transferring your pumpkin seeds? What things could you plant to grow in tandem with your pumpkins? You can [use kitchen scraps to start some other fruits or vegetables](#), and then transfer them outside to grow as well.
3. [Read](#) or [listen to the picture book](#), *How Many Seeds in a Pumpkin?* Take a close look at the different ways you can count pumpkin seeds. Choose a method from the book (or create your own) for counting seeds in your own pumpkin. Consider the notes from the back of the book to help you make your best educated guess on the number of seeds you will find inside the pumpkin before you begin.

**Driving Questions:** Why do leaves change color? How can we use an understanding of chromatography in our everyday lives?

## A Big Bite

### Resources

- *Why Do Leaves Change Color?*, picture book by Betsy Maestro, <https://bookshop.org/books/why-do-leaves-change-color-9780062382016/9780062382016>
  - *Why Do Leaves Change Color?*, video read aloud from Stories For Kids, <https://www.youtube.com/watch?v=Q5jTTJ9CjNQ>
  - Leaf Chromatography Activity, science experiment guide from Playdough to Plato, <https://www.playdoughtoplato.com/leaf-chromatography/>
  - Fall Leaves - Dates and Destinations 2021, guide from Framers Almanac, <https://www.farmersalmanac.com/fall-leaves-foliage-dates-map>
  - Leaf Color Chromatography - Bite Sci-zed, video tutorial from Alex Dainis, <https://www.youtube.com/watch?v=qH-AJDqsSI>
  - What Tree Is That?, guide from Arbor Day Foundation, <https://www.arborday.org/trees/whattree/>
  - Food Coloring Separation by Paper Chromatography, video tutorial from Sheila Hammon, <https://www.youtube.com/watch?v=uzUfsF8hmqY>
  - iNaturalist or PlantSnap, apps for identifying plants and trees, <https://www.inaturalist.org/> or <https://www.plantsnap.com/>
  - Paper Chromatography: Is Black Ink Really Black?, experiment tutorial from Science Buddies, [https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem\\_p008/chemistry/paper-chromatography?from=Home](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem_p008/chemistry/paper-chromatography?from=Home)
  - Fall Colors, resources from the USDA Forest Service, <https://www.fs.usda.gov/visit/fall-colors>
- \*Special supply note: This lesson requires Isopropyl alcohol, leaves, and coffee filters\**

### Project Idea/Scenario

Using autumn leaves, students will explore the pigments found within and learn why certain leaves change color.

### Sequence/Procedure

1. Discuss what the season of fall means to you.
  - a. What does fall in your region look like? Feel like? Are those things true for most people and this season?
  - b. Why is it called both autumn and fall? Discuss why leaves fall, and also the colors associated with fall.
2. Do you know the science behind leaves changing color? Think about what scientific processes

- might be at work here, and then [read](#) or [listen to the picture book](#), *Why Do Leaves Change Color?*
3. Take a walk outside. What leaves and trees do you see? What types of trees are in your neighborhood?
    - a. Deciduous trees shed leaves annually, while coniferous trees are mostly evergreen and produce cones. Which do you see?
    - b. Gather leaves of various colors that you can find. Make note of what tree they came from.
      - i. If you don't know the names of the trees in your neighborhood, you can use an app like iNaturalist or PlantSnap to check for information.
  4. [Conduct a leaf chromatography experiment](#). [Watch](#) the video, [read](#) about the experiment, gather materials, and conduct your own experiment.
  5. Record your results on your handout, found on page 10 of the lesson plan. Consider:
    - a. What colors/pigments were found in your leaves? If you traveled elsewhere, would you expect to find more color variation or less? What do you think would happen if you repeated this experiment in a month?
    - b. What colors did you find the most in your experiment? Label them either as:
      - i. **Chlorophyll** — green color found mainly in the chloroplasts of plants; it absorbs energy from sunlight to produce carbohydrates during photosynthesis
      - ii. **Carotenoids** — pigments in plants that produce bright yellow, red, and orange colors
      - iii. **Anthocyanins** — blue, red, or purple pigments found in plants, especially flowers, fruits, and tubers
    - c. Would you now be able to explain why leaves change color in the fall, and the components of those pigments that you find? See if you can write this up in a simple fashion in the Conclusion section of the handout.
  6. Select a project idea that will showcase your new knowledge around chromatography, and share your finished product while enjoying any of the recipes from the Fall Favorites kit.

### Possible Creations

1. Extend your study of chromatography a bit farther and conduct a similar experiment with water-soluble markers. [Use the video guide](#) or the [paper chromatography experiment write-up](#), and explore the composition of different colored marker or food dyes. Write up an explanation of what pigments are found in these products compared to the pigments found in leaves, and if the results surprised you in any way.
2. Create a video that explains the process, results, and conclusions of your chromatography experiment using leaves. How could you use chromatography to examine something else to discover its components?
3. Using knowledge of the varieties of fall colors that are possible, map out a fall colors journey to find the best locations for viewing fall foliage. [Use the guide from the Farmers Almanac](#) and plan a route to visit that would have the best colors and varieties of trees to view. Make sure to also [use the USDA guide](#) to include the right dates for traveling to potentially maximize seeing the peak of the fall colors.

### Growing Pumpkins - from Seed to Fruit

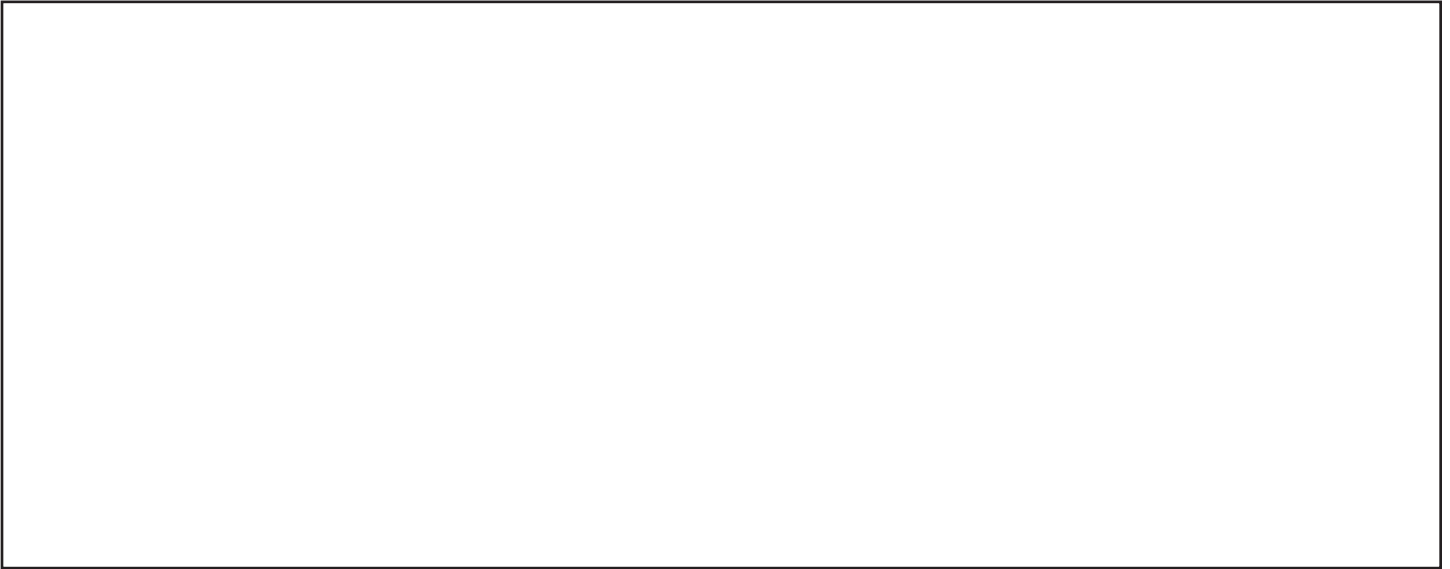
In each square, draw your seed every day. Observe and record any changes you can see. If there is nothing to note, you can draw what you imagine is happening within the soil.

<b>Day 1</b> Any growth? Yes/No	<b>Day 2</b> Any growth? Yes/No
<b>Day 3</b> Any growth? Yes/No	<b>Day 4</b> Any growth? Yes/No
<b>Day 5</b> Any growth? Yes/No	<b>Day 6</b> Any growth? Yes/No
<b>Day 7</b> Any growth? Yes/No	<b>Day 8</b> Any growth? Yes/No



## Leaves and Chromatography

What leaves did you find? Draw the shapes and color them here.



What colors, or separate components, do you think you will see in each leaf? Hypothesis:

While conducting the experiment, watch what happens with the leaves and the filters. Record your observations:

Results:

Conclusion:

How could you use this information from this experiment to test other materials to see what color pigments they contain?