OKC Beautiful

OKC HARVEST

LESSON 2: SEEDS & FALL PLANTING

2ND GRADE

INTRO VIDEO

bit.ly/Harvest-Seeds

The video introduces the concepts for this lesson and poses the following questions:

- What do seeds need to grow into plants?
- Can you keep vegetable crops alive in the cold?
- Based on how seeds look, can we guess how fast or slow they will germinate?

OBJECTIVES

- Students understand cool season crops are planted in late summer to grow as the seasons change to fall & winter.
- Students experience seed germination first-hand.

CONCEPTS

- Day length and temperature changes affect plant growth.
- Seeds are a step in many plant life cycles.
- Parts of a seed
- Germination process

VOCABULARY

- **Seedling –** a young plant.
- **Seed -** a small round or flat package containing a baby plant.
- **Germination –** the process of a seed sprouting and becoming a plant.
- **Seed coat –** the hard-protective shell which every seed has.
- **Root -** the part of the plant that grows downward from the seed. Roots absorb water and nutrients from within the soil.
- **Shoot –** the part of the plant that grows upward from the seed toward the sun.
- **Leaves –** Provide food for the plant once it has germinated.
- **Embryo** – the baby plant inside a seed.
- **Endosperm** - food stored within a seed for the developing plant embryo.
- **Cotyledon** - the first leaves which are inside the seed.

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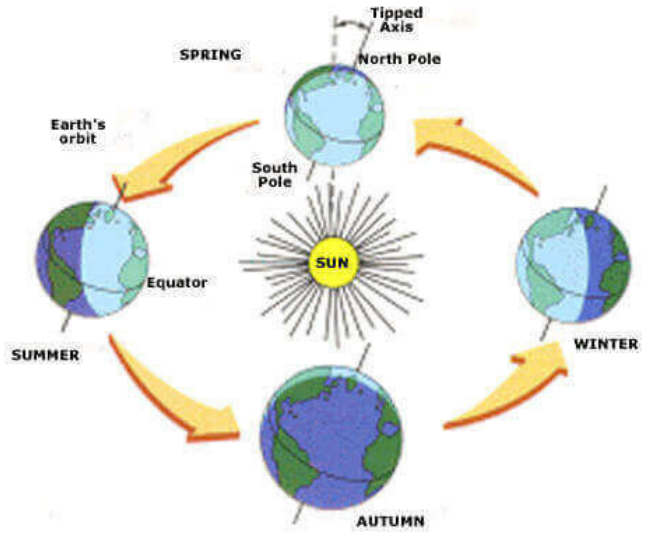
SELECTING FALL CROPS:

We plant hardy, cool season crops in the late summer and early fall so that they have time to get big before the cool weather arrives. Once it gets cold, as long as they are already nice and big, they will survive just fine.

Even though cool season crops can withstand the cold temperatures they may not grow a whole lot because plants grow more slowly in the cold and when the days are shorter.

WHAT CAUSES THE SEASONS?

During winter in the northern hemisphere, the earth is tilted away from the sun and our days are much shorter and colder. The result is slower growth of plants in the winter. The opposite happens in the summer!



OKLAHOMA GROWING SEASONS

WARM - April through late October
COOL - October through March

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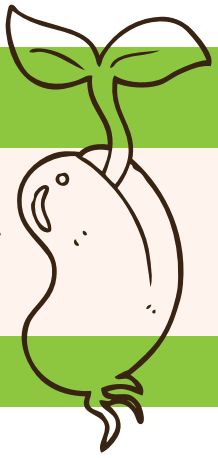
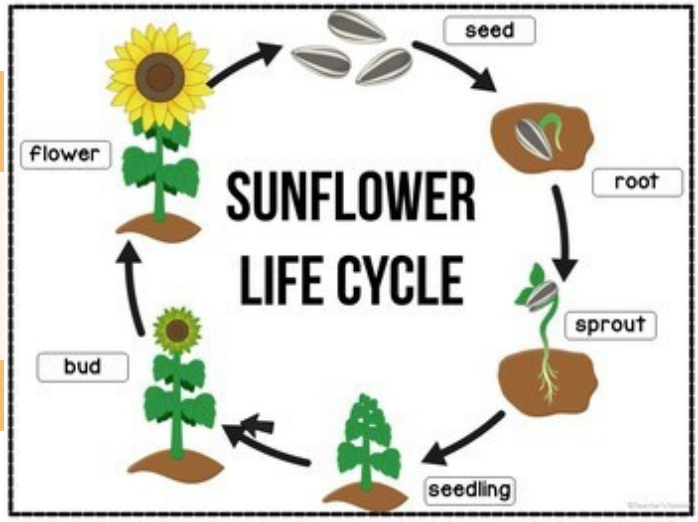
SEEDS

Seeds are the way plants produce babies, or new plants. Most of the veggies and fruits we grow in the garden produce seeds. Some plants produce hundreds per plant! Once given the right conditions, each seed becomes a brand-new plant.



PLANT LIFE CYCLE

Seeds are an important step in the lifecycle of many plants. For a seed to become a plant, very special conditions must be right.

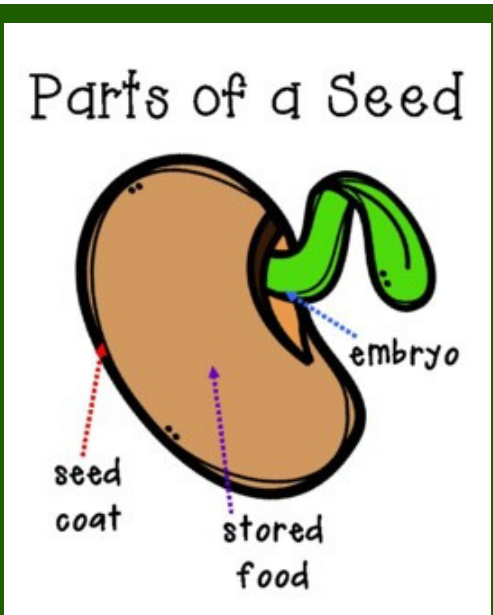


SEED PARTS

Seeds wear a jacket, called a **seed coat**. The seed coat protects the seed and prevents the seed from trying to grow in the wrong conditions.

Inside the seed is the **embryo**, which is the beginning of a new plant.

The seed contains stored food or energy that gives the seed the boost it needs to begin to grow. This is also called "**endosperm**."



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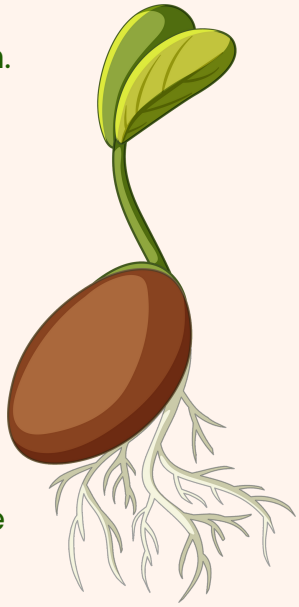
GERMINATION

When a seed comes in contact with warm, wet soil the seed coat softens and weakens. Once it cracks open, the baby plant inside the seed begins to emerge.

The process of a seed becoming a plant is **germination**.



Germination requires that:

1. The seed has contact with soil.
2. The soil is warmed by the sun.
3. The soil is damp. (slightly wet)

Once the seed opens and the embryo begins to grow, down goes the root and up goes the shoot. Once the shoot reaches the surface it unfurls its leaves.

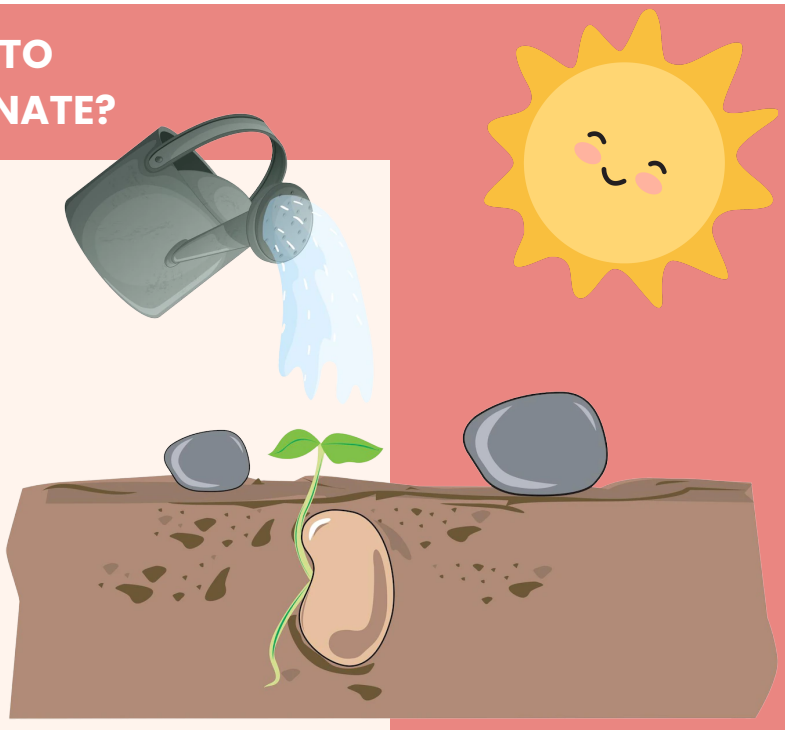
Without the correct conditions, our seeds would not germinate. We must be careful to plant at the right time so that the seeds get what they need.

WHAT DO SEEDS NEED TO SUCCESSFULLY GERMINATE?

Water

Room to Grow

Warmth



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PLANTING SEEDS

Gardeners plant seeds in the soil by making a little hole and placing the seed in the dirt. The bigger the seed, the deeper a gardener must plant the seed. Why? Because the roots need to be deep enough to hold the plant in place. Be careful not to plant the seeds too deep though. We don't want the seedling to run out of energy before it reaches the surface.

Each seed and type of plant has a different depth it needs to be planted.

When gardeners plant, they use rulers. We measure how deeply we plant a seed. We also measure how far apart we plant seeds. Sometimes for that we use a tape measure or a ruler.

Gardeners will often measure an inch on their fingers to have a "handy" unit of measure at all times.

MEASUREMENTS

We measure using different kinds of **units,** which is a different form of measurement. When measuring length, we often use units like millimeters, centimeters, inches, feet, and yards.

This ruler is showing us length in inches and centimeters, which are two units of length we frequently use.

APPLYING LESSON CONCEPTS

Garden Walk:
If you have a school garden or growing operation, conduct a garden walk and have students document their observations about the garden.

Journal Prompts:
- Can you find any seeds produced on the plants in our garden? Describe what they look like.
- Use your journal to draw the parts of a seed, including the seed coat, embryo, and food storage.

Observing Differences in Seeds:
Assemble a seed tray with cups of different kinds of seeds. Have students touch and observe the different sizes, textures, and colors of each seed.

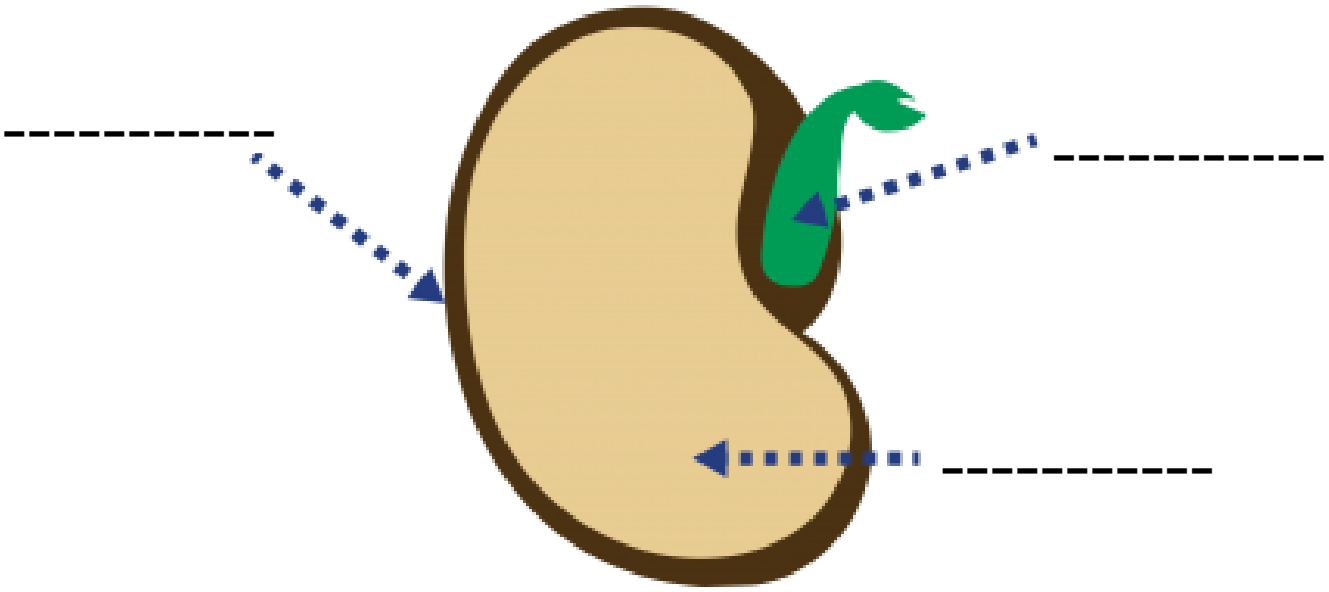
Seed Planting Activity:
If you have a school garden, you can do this activity outdoors. If not, you can use potting cups indoors to show the germination process.

Have students plant a few different types of seeds, using measuring tools to plant the correct depth and distance between.

LABEL THE PARTS OF A SEED

Using the words from the word bank, fill in the blanks below!

seed coat	endosperm	warmth
water	room	embryo



Seeds need _____ and _____ and

_____ to grow in order to germinate!

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APPLICABLE 2ND GRADE ACADEMIC STANDARDS

Science Standards

- 2.LS2.1 Plan and conduct an investigation to determine if plants need sunlight and water to grow. Plants depend on water and light to grow.
- 2.PS1.4 Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.

Math Standards

- 2.GM.2 Understand length as a measurable attribute and explore capacity.
- 2.GM.2.2 Explain the relationship between length and the numbers on a ruler by using a ruler to measure lengths to the nearest whole unit.
- 2.D.1 Collect, organize, and interpret data.
- 2.D.1.2 Organize a collection of data with up to four categories using pictographs and bar graphs with intervals of 1s, 2s, 5s or 10s

Language Standards

- 2.2.PC Students will correctly form letters in print and use appropriate spacing for letters, words, and sentences.
- 2.2.W.3 Students will correctly spell grade-appropriate words while editing.
- 2.2.W.4 Students will use resources to find correct spellings of words (e.g., word wall, vocabulary notebook, dictionaries).
- 2.4.R.1 Students will acquire new academic, content-specific, grade-level vocabulary, relate new words to prior knowledge, and apply vocabulary in new situations.
- 2.6.W.2 Students will organize information found during group or individual research, using graphic organizers or other aids.
- 2.7.R.1 Students will locate and use print and digital resources with guidance and support.