

# The Art of Growing Things

## Grades 3-5

Subject Areas - English Language Arts, Science, Visual Arts



### Objectives

Students will use seeds and plants to increase their vocabulary, conduct research, create a timeline and make presentations. They will observe plant growth habits in different locations in classroom and report their findings. Students will design and illustrate their own seed packets.

### Vocabulary

**barter**—exchange of goods or services without using money

**certified seed**—seeds which meet standards of genetic identity and purity

**fungus**—organisms which feed on living things, including yeasts, molds, and mushrooms

**genetic identity**—the proportion of genes which are identical in two similar populations

**plant hardiness zones**—a map which shows average low temperatures divided by 10°F increments

**in bulk**—method of buying and selling products which are not pre-packaged

**Shakers**—a religious group originating in England in 1747, which practices communal living

### Background

The Pilgrims carried seeds from England to help them start their first crops in the Massachusetts colony. Later immigrants, arriving from distant lands, carried their precious seeds in their pockets and sewn into the linings of their clothes and suitcases.

There were no stores where early settlers could go to buy seed. Those who had not brought seeds with them or saved them from the last year's crop had to order them from England. This could be a huge expense for a struggling frontier family.

For frontier families, saving seed for the next year's crop was as important as getting the crop planted. They became highly skilled at choosing the largest, best-looking seeds to use for the next planting season. Seeds were sometimes used for **barter** or as payment for services.

As the country became more settled, general stores opened and began selling seed in bulk. Seeds sold in bulk are stored in large containers, like wooden barrels or bins. The customer tells the clerk how much he or she needs, usually according to weight, and the clerk measures it out.

Some seed and feed stores still offer garden seeds and other grain crops to be purchased **in bulk**. These are usually seeds which grow well in the local climate and have proven to be popular with the public. Most garden seed is sold by the ounce, because most home gardens are small.

Farmers buy bulk seeds for field crops by the bushel. Sometimes they buy **certified seed** in 50-pound bags. In order to be certified, seeds must be approved by a certifying agency. Seeds are certified based on a certain set of standards designed to maintain a satisfactory level of **genetic identity** and purity.

## The Art of Growing Things (continued)

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Farmers may also save seeds from crops that produce particularly well. In that case, the farmer can hire someone to clean twigs and insect parts from the seeds, and then store the seed until it is time to replant. Stored seeds for crops must be dry and are often treated with chemicals to control **fungus** and keep insects from eating them. Big round metal bins with concrete floors and air blowers keep the seed grain safe and dry until the farmer is ready to plant the new crop.

The **Shakers**, a religious group in New York, started one of the first commercial seed nursery in the US. They placed their seeds in small paper packets called “papers.” Most garden seeds today are still sold in packages very similar to those first papers.

Early seed packets were decorated with beautiful line drawings. Today, seed packets sold in stores are usually decorated with photographs of the plants the seeds will produce. Besides the common name and sometimes the scientific name of the plant, the seed packet will also include information about suggested planting depth, spacing between plants and other information about care and use. Most seed packets also include a map of the United States showing the **plant hardiness zones**.

### Additional Reading

Aston, Diana, *A Seed is Sleepy*, Chronicle Books, 2014

Bairy Rattini, Kristin, *National Geographic Readers: Seed to Plant*, National Geographic, 2014

Carle, Eric, *The Tiny Seed*, Little Simon, 2009

Macken, JoAnn Early, *Flip, Float, Fly: Seeds on the Move*, Scholastic, 2008

Messner, Kate, *Up in the Garden, Down in the Dirt*, Chronicle Books, 2017

Robbins, Ken, *Seeds*, Atheneum, 2005

### Websites

<https://planthardiness.ars.usda.gov/PHZMWeb/>

<http://okcrop.okstate.edu/>

<https://www.noble.org/news/publications/ag-news-and-views/2020/april/seed-certification-what-is-it-and-what-does-it-mean-for-you/>

<https://seedstory.wordpress.com/a-brief-history-of-the-seed-industry/>

<https://connecticuthistory.org/shakers-revolutionize-seed-packaging-who-knew/>

<http://americangardening.net/did-you-know-the-seed-packet-originated-with-the-shakers/>

# The Art of Growing Things

## Activity 1

Grades 3-5 Teacher Resources and Standards

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### Activity 1: All About Seeds, (English Language Arts) 3-4 50 minute class periods

Students will use seeds and plants to increase their vocabulary, conduct research, create a timeline and make presentations.

#### Oklahoma Academic Standards

##### Activity 1: All About Seeds (English Language Arts)

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|----------------------------------|---|
| 3. 4.R.3<br>4. 4.R.3<br>5. 4.R.3 | Students will use context clues to determine the meaning of words or distinguish among multiple-meaning words.  |
| 3. 4.R.5<br>4. 4.R.5<br>5. 4.R.5 | Students will use a dictionary, glossary or thesaurus (print and/or electronic) to determine or clarify the meanings, syllabication, and pronunciation of words.  |
| 3.6.R.2<br>4.6.R.2               | Students will use graphic features including photos, illustrations, captions, titles, labels, headings, subheadings, italics, sidebars, charts, graphs, and legends to define a text.   |
| 3.6.R.4<br>4.6.R.3<br>5.6.R.3    | Students will determine the relevance and reliability of the information of the information gathered  |
| 3.7.R.1<br>4.7.R.1<br>5.7.R.1    | Students will locate, organize, and use information from a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal and interpretive questions and to create new understandings. |
| 3.7.R.2<br>4.7.R.2<br>5.7.R.2    | Students will compare and contrast how ideas and topics are depicted in a variety of media and formats.   |
| 3.7.W.2<br>4.7.W.1<br>5.7.W.2    | Students will create multimodal content that effectively communicates an idea using technology or appropriate media.  |
| 3.7.W.2<br>4.7.W.2               | Students will create presentations using video, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings  |
| 5.7.W.2                          | Students will create presentations that integrate visual displays and other multimedia to enrich the presentation.  |

# The Art of Growing Things

## Materials:

- Activity 1 Reading Page 1 “**All About Seeds**”
- Activity 1 Worksheet 1 “**Seeds and Packaging**”
- assorted seed packets
- seed catalogs
- gardening books
- scissors
- crayons
- glue
- markers
- packaging—two or three examples (brands) of same product

## Procedures

1. Read and discuss background.
2. Hand out Activity 1 Reading Page 1 “**All About Seeds.**”  
—Students will read the passage in pairs and create a list of words from the passage which are unfamiliar to them.  
—Students will use online resources or classroom dictionaries to find definitions of the words on their lists.
3. Hand out Activity 1 Worksheet 1 “**Seeds and Packaging.**”  
—Students will answer the questions.
4. Provide a variety of seed packets for students to view and handle.
5. —Students will list the kinds of information they find on the packets as you write their observations on the board.  
—Students will explain why each kind of information would be important to a gardener.
6. Each student will select a fruit or vegetable to research.  
—The student will use seed packets, seed catalogs, gardening books, encyclopedia, and online resources to research the selected fruit or vegetable.  
—The student will write a time-lapse diary, relating the experiences of the fruit or vegetable during its lifespan.  
—The student will produce a written version for the teacher and give a dramatic reading to the class.  
—The oral presentation will be videotaped for analysis and critique.
7. Lead a discussion about the impact of packaging on consumer choices.  
—Bring in examples of two or three brands of the same product.  
—Students will choose one brand over another, based on packaging.  
—Students will explain their choices.  
—Students will answer the following questions: Do advertisers use certain colors and shapes more often than others? Why?
8. Provide an assortment of old magazines.  
—Students will view advertising for common brands of products and note changes in packaging between then and now.  
—Students will discuss possible reasons for changes in advertising.
9. Provide samples of old packaging for students to compare with new packaging

The Pilgrims carried seeds from England to help them start their first crops. Later immigrants from distant lands carried seeds in their pockets. Some sewed them into the linings of their clothes and suitcases. There were no stores where early settlers could go to buy seed. When they needed to buy seeds, they had to order them from England. This could be a huge expense for a struggling frontier family.

For these families, saving seed for the next year's crop was as important as harvesting the crop. They would choose the largest, best-looking seeds to use for the next planting season. Seeds were sometimes used for barter.



As our country became more settled, general stores opened and began selling seed in bulk. Seeds sold in bulk are stored in large containers, like wooden barrels or bins. The customer tells the clerk how many pounds or ounces he or she needs, and the clerk measures it out.

Some seed and feed stores still offer seeds for sale in bulk. Most garden seed is sold by the ounce, because most home gardens are small.

Farmers buy seeds in bulk, by the bushel. Sometimes they buy seeds in 50-pound bags. Thousands of pounds of seed are needed to plant a crop like Oklahoma's number one cash crop, hard red winter wheat.

Sometimes farmers save seeds from crops that produce well. In that case, the farmer can hire someone to clean twigs and insect parts from the seeds. Then the seed will be stored until it is time to replant. Stored seeds for crops must be dry. Sometimes they are treated with chemicals to control fungus and keep insects from eating them. Big round metal bins with concrete floors and air blowers keep the seed safe and dry until the farmer is ready to plant.

The Shakers, a religious group in New York, started one of the first commercial seed nurseries in the US. They placed their seeds in small paper packets called "papers." Most garden seeds today are still sold in packages very similar to those first papers.

Early seed packets were decorated with beautiful line drawings. Today, seed packets sold in stores are usually decorated with photographs of the plants the seeds will produce. The seed packet will include information about suggested planting depth, spacing between plants, and other information about care and use. Most seed packets also include a map of the US showing the different USDA Hardiness Zones.

# The Art of Growing Things

## Activity 1 Worksheet 1: Seeds and Packaging



Name: \_\_\_\_\_ Date: \_\_\_\_\_

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1. Why did early settlers and immigrants carry seeds with them when they came to the New World?

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2. After our country was more settled, farmers could buy their seed from the

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3. Garden seeds are sold by the \_\_\_\_\_. Seeds for crops are sold by the \_\_\_\_\_ or the \_\_\_\_\_.

4. How is buying in bulk different from buying in packages?

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5. Name the religious group that first started selling seeds in packages?

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6. What information is usually included on a seed packet?

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7. Why would it be better to buy seed in bulk?

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8. Why would it be better to buy seed in packages?

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# The Art of Growing Things

## Activity 1 Worksheet 1: Seeds and Packaging

### ANSWER KEY



Name: \_\_\_\_\_ Date: \_\_\_\_\_

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1. Why did early settlers and immigrants carry seeds with them when they came to the New World?

There were no stores to buy seeds and ordering seed from England was expensive

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2. After our country was more settled, farmers could buy their seed from

the general stores

3. Garden seeds are sold by the ounce. Seeds for crops are sold by

the pound or the bushel.

4. How is buying in bulk different from buying in packages?

When you buy in bulk, you tell the clerk how much you want and the clerk measures it

out. When you buy in packages, the amount is already in the package.

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5. Name the religious group that first started selling seeds in packages?

Shakers

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6. What information is usually included on a seed packet?

Suggested planting depth, spacing between plants and other information about care or use.

Most seed packets also include a map of the US showing the different growing zones.

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7. Why would it be better to buy in bulk?

Possible answers - You can get as much or as little as you need, so there is no waste.

Sometimes it is cheaper because you don't have to pay for packaging or advertising.

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8. Why would it be better to buy in packages?

Packages have the information to tell you how to plant and pictures of the plant, so you

know what you are getting and can remember what kind of seeds they are.

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# The Art of Growing Things

## Activity 2

## Grades 3-5 Teacher Resources and Standards

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### Activity 2: What Plants Need, (Science)

1-2 50 minute class periods

Students will observe growth of plants under different conditions, graph their results and make oral presentations about their observations

### Oklahoma Academic Standards

#### Activity 2: What Plants Need (Science)

- 3.LS1.1            Develop and use models to describe that organisms have unique and diverse life cycles but all have a common pattern of birth, growth, reproduction, and death.
- 3.LS3.2            Use evidence to support the explanation that traits can be influenced by the environment.
- 3.LS4.3            Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 4.LS.1.1           Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 5.LS1.1            Support an argument that plants get the materials they need for growth chiefly from air and water.

#### Materials:

- seed/garden catalogs
- glass jars
- cucumber seeds, sunflower seeds and assorted other seeds
- paper towels

#### Procedures

1. Students will use seed catalogs or web sites to research to find five garden vegetables that will tolerate cool weather and five vegetables that must have warm weather to grow.
2. Students will line the insides of glass jars with damp paper towels and proceed as follows
  - Insert dry cucumber seeds between the towel and glass.
  - Place jars around the classroom in varying amounts of sunlight.
  - Record hypotheses regarding projected growth results.
  - Observe growth, measure, record and use data to develop line and bar graphs.
  - Students will give oral reports on their activities, with a representative of each group reporting after each observation.
  - Students will try the same experiment with sunflower seeds and then with a seed of their choice and compare results.
  - Students will create data tables to show the results from each seed and compare and contrast their findings.



# The Art of Growing Things

## Activity 3

## Grades 3-5 Teacher Resources and Standards

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### Activity 3: Design a Seed Packet, (Visual Arts)

1 50 minute class period

Students will research information that would generally appear on a seed packet and then design a seed packet for a plant they have selected.

### Oklahoma Academic Standards

#### Activity 3: Design a Seed Packet (Visual Arts)

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|-------------|---|
| 3.VA.CP.3.1 | Elaborate and revise artwork on the basis of insights gained through reflection and/or discussion.  |
| 4.VA.CP.4.1 |   |
| 5.VA.CP.5.1 |   |
| 3.VA.P.1.1  | Investigate, discuss and apply diverse resources and media (materials) in creating works of art using a variety of subject matter for creating themed works of art. |
| 4.VA.P.1.1  |   |
| 5.VA.P.1.1  |   |
| 3.VA.P.1.2  | Individually or collaboratively create works which represent places or objects that are part of everyday life.  |
| 4.VA.P.1.2  |   |
| 5.VA.P.1.2  | Design, redesign, or visually document places or everyday objects.  |

#### Materials:

- Seed catalogs and/or gardening books
- OSU Extension Fact Sheet HLA 6004 “Oklahoma Garden Planning Guide”  
<https://extension.okstate.edu/fact-sheets/oklahoma-garden-planning-guide.html>
- Crayons, colored pencils or markers
- Plain paper
- Activity 3 “**Seed Packet Template**”

#### Procedures

1. Provide seed catalogs and gardening books for students to use as resources.  
—Each student will choose a plant and create a seed packet design that would represent that plant using the Activity 3 “**Seed Packet Template**”  
—Students research and write the general information that would appear on the back of the seed packet.  
—Once the preliminary designs have been created, students will transfer artwork and information to the seed packet pattern on the student worksheet. Colors and extra details may be added at this time.
2. Designs will be displayed on a bulletin board under the lesson’s title, “The Art of Growing Things.”

