



The Seedy Side of Plants

Grade: K

Subject Areas:
Life Science,
Mathematics, Language
Arts

Skills: classifying,
sorting, observing,
predicting, counting,
reading

Duration: 1 hour

Connections:
plant science, ecology,
dexterity, math

Vocabulary

embryo

seed

seed coat

seed food

fruit

germination

sprout

burrs

dispersed

Objective:

Students will investigate the wonders of seeds through observing, collecting, describing and story telling.

Materials

- masking tape
- extra pairs of socks
- magnifying glasses
- examples of seeds
- fruit of the season (apples, squash, pumpkin, etc.)
- 10 large seeds per student
- The book *From Seed to Pumpkin* by Wendy Pfeffer

Standards

Strands: Excellence in Environmental Education Guidelines

Strand 1 — Questioning and Analysis Skills: B) Designing investigations: Learners are able to design simple investigations. **E)**

Organizing information: Learners are able to describe data and organize information to search for relationships and patterns concerning the environment and environmental topics.

Strand 2.2 —The Living Environment: B) Heredity and evolution:

Learners understand that plants and animals have different characteristics and that many of the characteristics are inherited.

California State Educational Standards:

Life Science 1b: Students know stories sometimes give plants and animals attributes they do not really have.

Life Science 1c: Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

Investigation and Experimentation (I and E) 4a: Students will observe common objects by using the five sense.

I and E 4b: Students will describe the properties of common objects.

I and E 4d: Students will compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).

Background

From Seed to Plant

Most children understand that puppies come from adult dogs and kittens come from adult cats and so on. By our nature, humans tend to have an inherent connection to animals. Animals, like us, have emotions and most of them can communicate on some level. They have eyes, a nose and ears. Animals are active and can move and play. Plants, on the other hand, are passive or inactive. They sit quietly and don't interact much with humans. Many times, changes in plants like growth or movement, go unnoticed by humans. Plants, however, have many things in common with animals.

Both plants and animals, like other living things have similar needs. At the very least, they need air, water, food, and space. Animals get their energy by eating other things, like plants. Plants get their energy by absorbing sunlight. Sometimes plants need animals to help them pollinate or disperse their seeds. Animals can also fertilize plants. Both plants and animals reproduce and have life cycles. A female dog usually gets pregnant after mating with a male dog. Fertilization happens when an egg and sperm unite. A fertilized egg develops into an embryo and later a fetus. An **embryo** is an underdeveloped offspring. In the plant world, there are male and female parts too. Plants can have both male and female parts on the same plant or sometimes plants are of different sexes; just like animals. The embryo in a plant is found inside a seed. **Seeds** are produced from the female portion of a flower. Once a flower gets pollinated the egg becomes fertilized.

This fertilized egg develops into a seed.

Plants vary widely in their form and function. Not all plants, for example, ferns develop seeds. A seed is a plant embryo that is dormant, protected inside a seed coat, waiting for the right conditions. A seed comes equipped with everything it needs to grow if given the right environment. Inside the **seed coat** is a source of food called endosperm, however, young children may want to call this layer, **seed food**. Seeds come in a variety of shapes and sizes, and each type of seed will grow into a different type of plant. Seed plants provide humans with

most of our food. The most popular human foods come from plants like corn, rice, wheat, fruit and vegetables. Sometimes seeds develop inside fleshy fruit like watermelons, apples, pumpkins and squash. These types of plants are called fruit. **Fruit** develop flesh around their seeds. The seeds inside fruit such as tomatoes and berries are much harder to see because they are tiny. Some seeds are easier to see because they are not encased in thick fruit like seeds inside a pea pod or on the head of a grass plant. Vegetables produce seeds too, but usually people harvest these food plants before they go to seed. Beans,

Local Connection

The University of California Extension program offers many services, one of which is the Humboldt County 4-H program. 4-H is the Youth Development Program associated with UC Davis. It is involved in many youth oriented civic engagement and natural resources projects. Once a student enters kindergarten, he or she is eligible to join in the fun. Learning opportunities for youth ages 5-19, include summer camps, service projects, and after school programs, as well as ongoing membership.

When young people get involved in 4-H they are encouraged to discover and develop their full potential. Through participation, 4-H endeavors students to develop leadership skills, initiate and assume responsibility and develop a positive self image. One of the more valuable programs gets students involved in a community project. In the Southern Humboldt area, 4-H continues to be a part of several gardening projects which are mostly after school programs. Gardening projects have been instituted at Redway, Whitethorn, Mattole and Petrolia schools.

Many subjects including technology, forestry, gardening, natural resources, livestock and agriculture are embedded in their ever expanding library of resources. Curriculum resources in these areas are available for teachers and other informal educators by grade level. Resources include pamphlets, books, videos and on loan teaching kits. For more information check out the website:

www.cehumboldt.ucdavis.edu or contact
Sandy Sathrum, sksathrum@ucdavis.edu
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peas, rice, and nuts are all different types of seeds.

Seeds Needs

Seeds need soil, water and light to germinate. **Germination** gets a seed to sprout. A **sprout** is an immature plant that if given the proper environment, will slowly grow into a new plant. Sometimes plants take a long time to grow and can grow to be very old. Redwood trees are like this. Redwoods have tiny little seeds and if one survives, it can grow to be 2,000 years old. Because plants don't move, their seeds need to travel instead. Plants may be more successful if they can transport their seeds to a new place. Conditions where plants grow change over time. Sometimes, plants get shaded out by larger plants, like trees. In order to survive, they need to get their seeds to a sunnier location.

There are lots of ways seeds can travel. Many seeds are very light weight and are spread by the wind. Some seeds hitch a ride on animals. Seeds have ways of clinging to the fur or feathers of animals, and sometimes they will even hitch a ride on the legs of people. If seeds are eaten by animals they can turn up in a pile of poop. The poop fertilizes the seed. Many seeds are spread by birds this way. Livestock like cows and goats have accidentally spread seeds to new places after sticking to their legs. Seeds that stick are called **burrs**. Some burrs even have hooks. Occasionally plants can fling their seeds far away by a variety of methods, including having coiled springs. Other seeds have wings so they can fly. When seeds travel they are being **dispersed**.

Some seed coats are very hard and thick and won't grow if they are placed in the ground. Many of these types of seeds need the help of fire. Fire can

break open hard seeds or tough cones. People sometimes use nut crackers or hammers to open up tough seeds like walnuts or pine nuts. Some birds and squirrels have been known to drop seeds onto rocks to crack open tough ones.

Seeds are a part of a plant's life cycle. They come from a fertilized flower and are equipped with what they need to grow inside a seed coat. Different plants have different seeds and each one needs just the right environment to grow successfully. By observing these environments, people can learn more about plants and may even be able to save the occasional rare one.

Activity 1: Counting and Observing Seeds

Preparation

Seek out a place on or near campus ahead of time that has seeds. This might be an unmowed field. To save time, have 10 seeds in little cups ready to pass out to the students when the time comes.

Procedure

1. Gather the students around and tell them they are going to learn about seeds. At this young age, students will want to share their stories and will make many things up. To save time and to keep them focused, tell them that only one person can give an answer at one time. Ask them some questions about seeds. To start, you may want to ask them what letter the word seed starts with. Write the word “seed” on the board. Tell them that there is a word that begins with the letter “s” and means quiet. Ask them if they know what this word is (the word is silent). If the group gets too loud, have them all say s-s-s-s-s to say “silent”. Another incentive to use is to tell them that they may be able to go outside if they are good. Remind the students that only one person can respond to a question.

2. Next, sing a song together. Hand out 10 sunflower seeds to every student. Tell them they are going to sing a song called “Ten Little Apple Seeds”. The song goes like this:

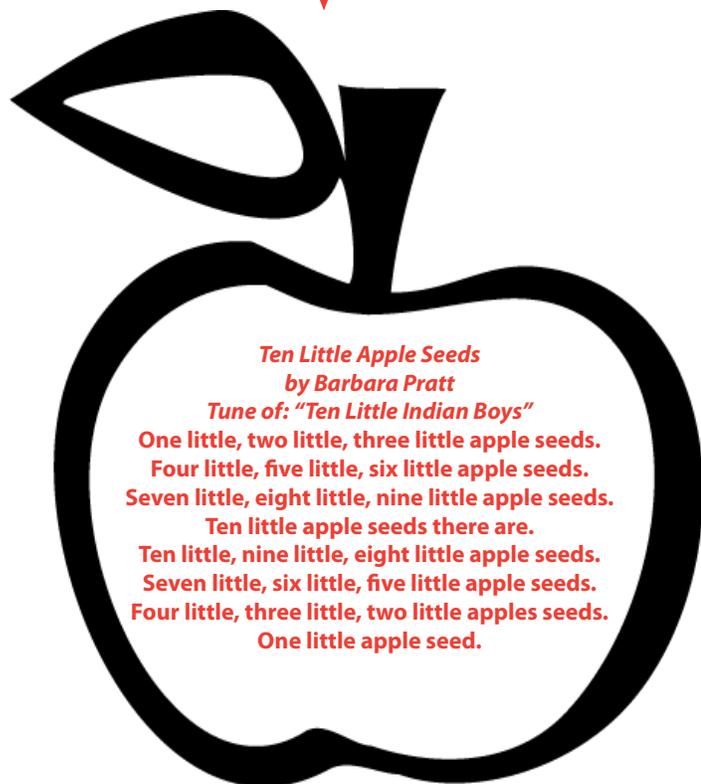
3. As they sing the first verse, the students should have all of the seeds in their hand. They will place one seed down at a time onto a table or a rug with the rhythm of the song. You may want to start singing the song very slowly until they get the knack of it. As they sing the second verse, they should pick the seeds up one at a time. An option is to use a felt board and have ten brown pieces of felt cut out to use as they sing the song.

Materials

- masking tape
- extra pairs of socks
- magnifying glasses
- examples of seeds
- fruit of the season (apples, squash, pumpkin, etc.)
- 10 large seeds per student

Hold up some seeds and ask:

- What do we call this? Or this? (hold up another seed)
- If I were looking for a seed in this room, where could I find one? (the fruit)
- Where do seeds come from?
- What does a seed need to survive? (soil, water, light)
- Do we eat seeds?
- What else might eat a seed?
- If I cut open this “apple” (for example) how many seeds do you think there will be? (cut open the apple and count the seeds with the class)



Activity 1 continued...

4. Next, have the students line up. Tell them they are going to collect seeds outside a special way. They are going to try and find seeds that stick to them. Have them roll up their pant legs and begin to wrap tape around one of their hands. The sticky side of the tape needs to be faced outwards. *Note: not all students need to have both socks and sticky tape. Hopefully, most are wearing socks, but if not have them put on some spare socks.* Before they go outside, ask them where they think they can find seeds outside (under trees, in grass, etc.). Give everyone a sticky bracelet that wants one.

5. Lead the students on a walk. As they walk around, have them stick out their hands and see if they can catch seeds. It is okay to pick seeds off the ground too, but don't let too many of them do this. After most students have a few seeds in their socks or on their sticky tape, look at the seeds back in the classroom using magnifying glasses. Keep in mind that some students may never have used magnifying glasses and may need assistance. This observation is sure to turn up things to talk about. Students can sort seeds by color, shape or sticky-ness.

6. After they have had adequate time exploring, have them sit down again. Ask them why they think seeds might want to stick to them.

Activity 2: What a Seed Needs to Grow

Procedure

1. Gather the students onto a rug and quiet them down by reading them a story about seeds.

Materials

- The book *From Seed to Pumpkin* by Wendy Pfeffer (or another book about seeds)



Extensions

- Grow a garden on campus. Watch how the garden changes with the seasons.
- Have students sort seeds based on size, shape, and color.
- Use seeds for art projects
- Crack open whole walnuts, pecans and almonds so kids can see the seeds in side. (no peanuts)
- Make a bean buddy necklace. Students sprout a seed in plastic bag that they can wear around their neck throughout the day.
- Grow seeds in different environments to see which ones sprout.

References

Have Seeds Will Travel, Tree Factory, Project Learning Tree Environmental Education Activity Guide PreK-8, 2nd Edition, pgs. 139-141, American Forest Foundation, 1994

Pfeffer, Wendy, From Seed to Pumpkin, Harper Collins Publisher, 2004

Plant Life Cycles, http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp_plantcycle/, 2011

Post, Amanda, Inside a Seed, <http://www.atozteacherstuff.com/pages/343.shtml>, 2011

Pratt, Barbara, How Many Apple Seeds? , <http://www.fastq.com/~jbpratt/education/mypages/howmanyapple-seeds.html>, 2002

The Seedy Side of Plants, <http://www.pbs.org/wnet/nature/plants/adaptable.html>, 1999

FOSS Connection

Grade K
Earth Science: Trees
Life Science: Trees

Diagram of a Seed

