



Duration

Location

Supplies

Standards

PLANTING FOR POLLINATORS

OBJECTIVE

Students will:

- Understand the components of healthy soil and its importance to plants.
- Learn about the global decline of pollinators and recognize the connection of pollination to fruit production.
- Plant flowers to help pollinators (bees and butterflies) find food.

S.O.I.L.

The presenter/farmer informs students that we are going to spell a “mystery” word and it is a very important thing that farmers take care of.



- We take out a large jar with the letter **S** on it. Each Jar has an ingredient in it and is all part of the mystery word we are spelling. Ask questions, what letter is this? What sound does it make? Do you see any words that start with S? We reach into the S jar and pull out a variety of **STONES** (or Rocks). Rocks break down into SAND, SILT and clay particles. We have a hammer and goggles in the jar to break apart some rocks to simulate the **weathering** process. Rocks break down in nature during the rock cycle. Are all my rocks the same? (No)- There are three major groups of rocks: igneous, sedimentary and metamorphic. Are rocks alive? (No) Were they ever alive? (No) This is the non-living part of the word we are spelling today.

- The **O** jar has **Organic matter**-leaves, grass, and newspaper (made from trees). Plant parts that were alive and growing but now they are decomposing. (We all cheer...Root for Rot)
- The **L** jar has **Living Organisms**- worms, centipedes, fungi and bacteria are all alive and they are all part of the word we are spelling
- **I** is for **Important Information**. Inside this jar are fruits and vegetables that we might eat. These fruits and vegetables are important for us to eat and grow good, strong, healthy bodies.

The word we spelled is **SOIL**...it is not dirt! **Soil is essential to all life** and farmers work hard to keep the soil healthy so the plants will grow.

We investigate further (with a magnifying glass) into the **I** jar to find a flower inside with **Important Information!** Every fruit used to be a flower that a bee pollinated. A bee visits a flower and collects dust (pollen), when the bee travels to the next flower **pollen** is left behind...the process is called pollination and that's how we get fruit! About 75 percent of all flowering plants on Earth rely on animals to transfer their pollen. About one in every three bites of food you eat depends on pollinators



SCIENTISTS NOTICE BEE POPULATIONS ARE DECLINING

Due to a number of factors such as disease, habitat loss, and pesticides, bee colonies and other pollinators are currently on the decline. Once students learn that the world's bees are in trouble, we let them know that they can do something to help. We can plant flowers and spread the message for people to be nice to bees!

PLANTING FOR POLLINATORS

Bees, butterflies, and other pollinators need access to abundant nectar and pollen resources throughout the growing season. We can plant flowers to help! The flowers we are planting today will provide food for butterflies, honey bees and native bees.

- Students will each be given a Cow Pot to decorate with markers. They should put their name on the pot along with a bee friendly message of their choice. Cow Pots are made from cow manure. They are 100%



biodegradable and the plants love them. Cow Pots are a great replacement for plastic pots. Plastic is not so fantastic for the earth.

- Measuring Soil- each student will fill their pot 2/3 filled with soil
- Count the sunflower seeds. Add 10 seeds to your Cow pot and cover the seeds with more soil...fill it to the top.
- Create a marker for your pot and spread the message to BE NICE TO BEES!
- Students can plant the pots in a sunny part of their yard. Be an entomologist and watch for honey or native bumble bees in your yard. Be a scientist and record daily temperature, measure plant growth and document insect observations. Scientists are looking for the rusty patch bumble bee. Because of global bee decline they think it is extinct...but if you spot one during your observations, they want to know about it to help them recover.



EXTENSIONS

Native bees

There are 4,000 species of native bees in the United States.

Native bees come in a wide array of sizes, shapes, and colors. They are also varied in their life styles, the places they frequent, the nests they build, the flowers they visit, and their season of activity. Your students will be fascinated by diversity of bee species, squash bees, bumble bees, carpenter bees, southeastern blueberry bees, cuckoo bees and more. They provide an invaluable ecosystem service, pollination to 80 percent of flowering plants.

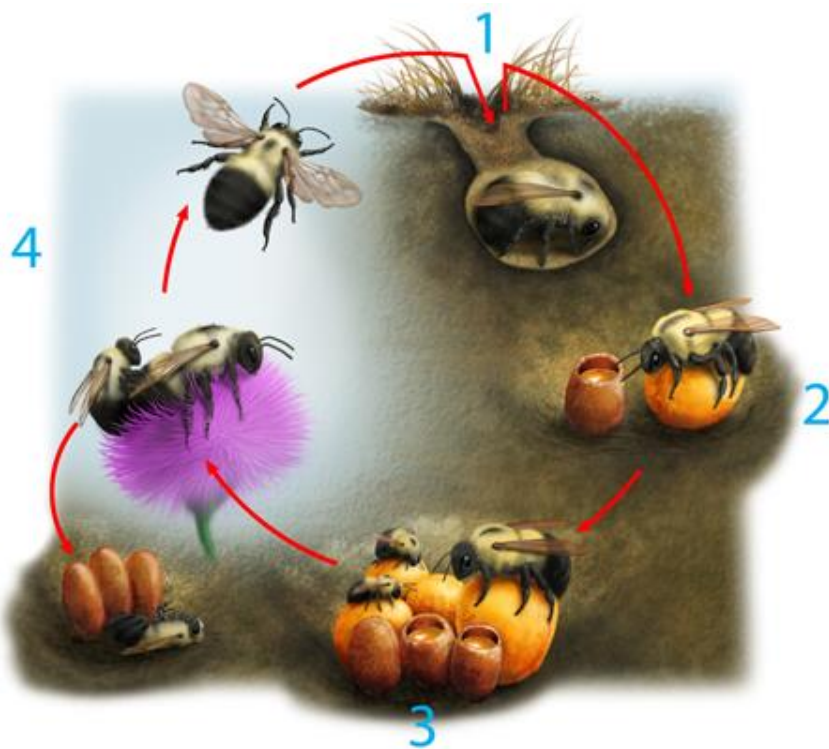


Bumble bees

There are about 50 species of North American bumble bees. Bumble bees have some things in common with honey bees; they are more sociable than most other native bees, forming colonies with one queen and many workers. Bumble bees are commonly found in greenhouses pollinating tomatoes and other agricultural crops.

Bumble bees face many threats including habitat loss, disease, pesticide use, and climate change. Unlike honeybees which have large (>10,000 individuals) perennial hives, bumble bees produce smaller annual colonies (50-1,500 individuals). Due to their smaller annual population sizes, life cycle, and genetic makeup, they are uniquely susceptible to extinction.

Understanding the life cycle of a typical bumble bee colony is the first step in understanding their unique habitat needs.



1. A queen emerges from hibernation in spring and finds a nest site, such as an abandoned rodent burrow.
2. She creates wax pots to hold nectar and pollen, in which she lays and incubates her eggs.
3. When her daughters emerge as adults, they take over foraging and other duties.
4. In autumn the colony produces new queens and male bees, who leave to find mates. Newly mated queens hibernate and the rest of the bees die.

TEACHER RESOURCES

USDA Forest Service and Pollinator Partnership-Bee Basics

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5306468.pdf

Xerces invertebrate conservation

<http://www.xerces.org/>

Pollinator Partnership

<http://pollinator.org/education>

Soil Lessons

Natural Resources Conservation Service <https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/edu/>

VOCABULARY

Biodegradable-a substance or object capable of being decomposed by bacteria or other living organisms.

Igneous rock-Extrusive igneous rocks cool and solidify quicker than intrusive igneous rocks. They are formed by the cooling of molten magma on the earth's surface. The magma, which is brought to the surface through fissures or volcanic eruptions, solidifies at a faster rate.

Metamorphic rock- a result of a transformation of a pre-existing rock. The original rock is subjected to very high heat and pressure, which cause obvious physical and/or chemical changes. Examples of these rock types include marble, slate, gneiss, schist.

Organic- relating to, or derived from living organisms

Pollination-the transfer of pollen to a stigma, ovule, flower, or plant to allow fertilization.

Sedimentary rocks- types of rock that are formed by the deposition and subsequent cementation of that material at the Earth's surface and within bodies of water. Sedimentation is the collective name for processes that cause mineral and/or organic particles (detritus) to settle in place.

Soil- a mixture of minerals, organic matter, gases, liquids, and countless organisms that together support life on Earth.

Weathering- the breaking down of rocks, soil, and minerals as well as wood and artificial materials through contact with the Earth's atmosphere, waters, and biological organisms.

PLANTING FOR POLLINATORS

CT Common Core Science Standards

- PK.1 Objects have properties that can be observed and used to describe similarities and differences
- PK.2 Many different kinds of living things inhabit the earth.
- PK.3 Weather conditions vary daily and seasonally
- PK.4 Some objects are natural, while others have been designed and made by people to improve the quality of life.

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- 1.2 Living things have different structures and behaviors that allow them to meet their basic needs.
- 1.3 Organisms change in form and behavior as part of their life cycles.
- 2.4 Human beings, like all other living things, have special nutritional needs for survival
- 3.2 Organisms can survive and reproduce only in environments that meet their basic needs.
- 4.2 All organisms depend on the living and nonliving features of the environment for survival.

Teachers: Your field trip to the farm easily connects to Connecticut Common Core Social Studies Standards. We create an opportunity for students to compare farm life from the past to a farms contribution to our communities today.

Connecticut Core Standards

http://ctcorestandards.org/?page_id=9591

We can custom design programs to meet your needs.

Flanders Education Office 203-263-3711 ext 12 Email flanders@flandersnaturecenter.org

www.flandersnaturecenter.org

We are currently updating our programs to NGSS

Next Generation Science Standards

<http://www.nextgenscience.org/>