

Colorado's Organic Food

Subject Area: Food Science

Unit Title: Organic Foods

Grade Level: 4th & 5th grade

Objectives: To help students understand what organic foods are and how to grow them.

Colorado Content Standards to be covered:

SCIENCE

Standard I - Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

Standard II - Physical Science: Students know and understand common properties, forms, and changes in matter and energy.

Standard V - Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.

Anticipatory Set: Create a class “KWL” on the board by brainstorming with your students and having them fill in what they already know about organic food on a yellow sticky note (post these in the first column “K”). Do the same with what your students want to learn (middle column “W”), and after the lesson have them fill out sticky notes to post in the last column with what they learned (“L”).

Ask the students to fill in the first column of the included Vocabulary Knowledge Rating Chart indicating how well they know each vocabulary word before the lesson (first column).

Materials:

- sticky notes (or scraps of paper)
- Sprouting seeds to select from: broccoli, radish, alfalfa, mung beans, or lentils
- **Vegetable seeds can be found at most nurseries, Whole Foods, Vitamin Cottage and Food Co-ops**
- Glass jars - need to have plenty of room for seeds to sprout and expand (e.g. quart size ball jars)
- Cheese cloth (or other material that will allow water to permeate through)
- Rubber bands
- Towel
- Water

Vocabulary for Organic Food Production:

crop – group of plants or animals raised for agricultural purposes

fertilizer – manure or chemical mixture used to put nutrients into the soil

pesticides – chemicals used to control insects, weeds, and diseases

irradiation – exposed to radiation with purpose of damaging harmful micro-organisms

sewage sludge – semi-solid material produced by treatment processes (industrial, water treatment, or wastewater treatment)

Genetically Modified Organisms (GMO) – organisms whose genetic material has been changed using science

Input:

What is “organic?” To a scientist or someone writing a dictionary, organic means, “related to or derived from living things.” To the people who produce our food, “organic” means making a choice to grow or raise food crops using a certain set of rules. These rules help ensure that organic food is grown relying on natural biological processes. Organic food does not use synthetic chemicals like fertilizers or pesticides. The same set of rules also does not allow the use of irradiation, sewage sludge, or genetically modified organisms (GMO). When a farmer or rancher follows all these rules he or she can have a crop certified as organic. Certifications are done by someone who knows all the rules. They are called an “organic certifier.” The organic certifier makes sure the animals or crops were raised using organic methods.

Did you know that humans first started farming thousands of years ago? At that time everyone grew their crops organically. About 100 years ago, when chemical fertilizers were invented, many farmers and ranchers started using them regularly. Chemical fertilizers replaced a lot of organic fertilizers. Now many farmers and ranchers are trying organic methods again.

The amount of organic products that people buy in the U.S. has increased about twenty percent each year since 1990. This means that more and more people want things that are produced and certified organic. This also means that farmers need to grow more organic products to meet this demand.

Farmers all over Colorado, the U.S., and the world have looked at the benefits and challenges of growing plants and animals using organic methods. Many have made the choice to use these methods.

Vocabulary for Organic Food Production:

organic – related to or derived from living things

crop – group of plants or animals raised for agricultural purposes

fertilizer – manure or chemical mixture used to put nutrients into the soil

pesticides – chemicals used to control insects , weeds, and diseases

irradiation – exposed to radiation with purpose of damaging harmful micro-organisms

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Checking for Understanding: At the end of this section choose one of the following for a quick check: ask the students to partner share and think, pair and share, do a quick 3 word write up as an exit slip, do a quick sketch or give each other a quick thumbs up or down to check for understanding. Determine the level of mastery for each student and provide individual remediation as needed.

Procedures/Activities:

Classroom Growers

Note: If you’re going to eat the sprouts when done, please make sure your students wash their hands thoroughly before starting.

1. Soak a few seeds (broccoli, radish, alfalfa, mung beans, or lentils) in a each glass jar with water for about 12 hours. Put enough water in the jar to completely submerge the seeds (roughly more water than twice the volume of the seeds). The seeds will soak up some of the water.
2. Cut enough cheese cloth to cover the top of each jar, secure the cloth with a rubber band.
3. Strain the water, leaving the cheese cloth in place.
4. Place jar(s) upside down at an angle, so excess water can drain (e.g. lean against a wall).
5. Cover the jar(s) with a towel for 12 hours. This provides a cooler temperature.
6. After 12 hours, rinse the sprouts with water leaving the cheese cloth in place. Repeat step 3.

7. Expose sprouts to 1 hour of sunlight each day.
8. Repeat steps 3, 4, and 5 until your seeds have sprouted and grown to the desired length (usually takes 3-7 days depending on air temperature). The warmer the temperature, the faster the seeds will sprout, however, normal room temperature will also work.
9. Sprouts are considered a good source of protein and vitamin C. Sprouts can be grown anytime of the year. Have student taste the sprouts to see which kind they like best. Enjoy them on a bagel with cream cheese or tossed in a salad.

Discuss:

Take time to discuss the growth of the sprouts. Encourage the students to think about why the sprouts need this type of schedule (e.g. darkness, 1 hour of light, rinsing). (Try to get your students to think about what other types of plants they can grow and eat fresh.) Also, you may want to graph and chart the progress of sprouting seeds or write notes in a science notebook. Then compare the time it took to grow each kind of sprout.

Closure: Review and clarify the key points of the lesson by having students fill out a sticky note with what they learned to be posted in the “L” column on the “KWL” chart on the board.

K (Know)	W (Want to Learn)	L (Learned)

Vocabulary Knowledge Rating Chart

Before the Lesson:

In the first column indicate how well you know each vocabulary word by using “1” to represent “I know what it means,” “2” “I sort of know what it means,” or “3” for “I don’t know what it means.”

After the Lesson:

In the second column indicate how well you know each vocabulary word after the lesson, by using “1” I know what it means, “2” I sort of know what it means, or “3” I don’t know what it means. Next write down the definition and give at least one example or use the word in a sentence.

Vocabulary Word	Before Lesson	After Lesson	Definition	Example/Sentence
organic				
fertilizers				
pesticides				
irradiation				
sewage sludge				
genetically modified organisms (GMO)				

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Vocabulary Word	Before Lesson	After Lesson	Definition	Example/Sentence
organic			related to or derived from living things	answers will vary
fertilizers			manure or chemical mixture used to put nutrients into the soil	
pesticides			chemicals used to control insects , weeds, and diseases	
irradiation			exposed to radiation with purpose of damaging harmful micro-organisms	
sewage sludge			semi-solid material produced by treatment processes (industrial, water treatment, or wastewater treatment)	
genetically modified organisms (GMO)			organisms whose genetic material has been changed using science	