



fork farms

*Unleashing the power of fresh food
production for happier, healthier people.*

FLEX FARM LESSONS



(GRADE LEVELS K-2)

HOW MANY OF EACH WILL IT TAKE?

🕒 30 minutes

Materials/Preparation

- ▶ FLEX FARM
- ▶ VARIETY OF CONTAINERS IN THE FOLLOWING MEASURES (CUP, PINT, QUART, LITER, GALLON)
- ▶ WATER, RICE, OR SAND TO FILL THE CONTAINERS WITH
- ▶ EXAMPLE PLANTS
- ▶ CHART PAPER OR WHITEBOARD

STANDARDS

Math

- ◇ Identify and describe shapes.
- ◇ Reason with shapes and their attributes.

Learning Objectives

Students will be able to determine the number of containers it will take to fill the water supply for the Flex Farm.

Background/Overview

The Flex Farm has two water tanks that can hold up to 15 gallons of water each. In this lesson, students will work with a variety of containers to determine how many of each container it will take to fill the water tank on the Flex Farm.

Activity

1. Show students an example plant and ask them what they think a plant needs to grow. Write their ideas down on chart paper or a whiteboard. Make sure that students are able to identify that plants need sun, soil, water, and air to grow.
2. Show students the Flex Farm and discuss how the water tank provides water to the Flex Farm. Discuss with students the size of the water tank. Have the students turn and talk to predict how much water the water tank can hold. Take several responses from the students before providing them with the amount of water the tank can hold.
3. Show the students the variety of containers. With a partner, have students predict how many of each container it would take to fill the water tank on the Flex Farm. Explain that the Flex Farm's water tanks can hold up to 15 gallons of water each. Then have the students predict how many of the quart containers it would take to fill a one gallon container. Model with the water, rice, or sand showing the students how many quarters it takes to fill a gallon. Repeat for other containers.
4. On chart paper or the whiteboard, keep track of the number of quarts in a gallon, etc.

Assessment

With a partner, have the students review their prediction from earlier. Based on the information presented in class, have the students make changes to their predictions. Share out as a class.



(GRADE LEVELS 3-5)

WHAT ARE THE BENEFITS OF EATING VEGETABLES?

🕒 60 minutes



Materials/Preparation

- ▶ A COPY OF THE USDA'S MYPLATE POSTER VEGETABLES AND FRUITS GROWN IN THE FLEX FARM OR FROM ANOTHER SOURCE
- ▶ PICTURES OF OTHER FRUITS AND VEGETABLES
- ▶ PAPER FOR WRITING

STANDARDS

Health

- ◇ Describe the relationship between healthy behaviors and personal health.

ELA

- ◇ Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Social Studies

- ◇ Identify examples of the variety of resources (human capital, physical capital, and natural resources) that are used to produce goods and services.

Learning Objectives

Students will become familiar with a variety of healthy fruits and vegetables.

Students will know where to find healthy food options.

Students will be able to explain the benefits of healthy eating.

Background/Overview

Being able to identify and locate healthy fruits and vegetables is an important part to making healthy eating choices. This lesson shows students how to identify and locate healthy eating choices.

Activity

1. In a large group, show students the MyPlate poster. Point to the two sections on the plate labeled Vegetables and Fruits. Explain to the students that today they are going to discuss why it is important to eat fruits and vegetables and where to find them.
2. Show students the pictures and real fruits and vegetables. Brainstorm with the students a list of benefits of eating fruits and vegetables. Some examples could include:
 - a. Taste good
 - b. Easy to find and eat
 - c. Filled with important vitamins and minerals
 - d. Full of fiber (fiber keeps your digestive system happy)
 - e. Different textures and colors make eating fun
 - f. Provides energy to play
 - g. Helps to reduce chance of getting sick
3. Have the students turn-and-talk to a partner about places that they could find fruits and vegetables. Some examples are:
 - a. A grocery store
 - b. A farm
 - c. The school cafeteria
 - d. A kitchen
 - e. A garden
 - f. A farmers' market
4. Have the students pick one vegetable or fruit that they like or would like to know more about. Have them write an informational brochure that includes:
 - a. What they like about the vegetable/fruit
 - b. What are the benefits of eating it
 - c. Where they could find it
 - d. Different ways that someone could eat it

Assessment

Students can share in a large group their brochure. Afterward, the brochures can be displayed for students to look at afterward.



(GRADE LEVELS 6-8)

WHAT DOES ORGANIC MEAN?

🕒 50 minutes

Learning Objectives

Students will understand and analyze what makes something organic vs. inorganic.

Background/Overview

There are a lot of questions around what makes a product “organic” or not. This lesson clarifies how products are classified as organic. Students then explore the pros and cons of organic farming. This activity uses apples as an example, but any fruit or vegetable can be used for the lesson.

Activity

1. Show students the organic and non-organic apples. Have them discuss the differences between the two apples. On chart paper, list the differences that they see. Some examples could include:
a. Skin (*blemishes, waxy coating*) b. Size c. Shape d. Color
2. Have the students hypothesize which they think is organic and which was grown conventionally. Have students work with a partner to come up with their definition of the term organic. Have each pair partner with another pair, share their definitions, and create a new definition as a group of four.
3. Give the groups of four access to computers or preselected articles (for example: <https://www.nationalgeographic.com/environment/future-of-food/organic-farming-crops-consumers/>). Have students look for information to add to their definitions.
4. In their groups, have them create a T-chart that outlines the pros and cons of organic farming. Some areas that students should consider include:
a. Food production b. Impact on the environment (*water, soil, biodiversity*)
c. Quality of produce d. Economic impact

Assessment

Have groups post their charts around the room. Give groups a chance to look at other posters to see if there is any information they missed.

Materials/Preparation

- ▶ CHART PAPER
- ▶ MARKERS
- ▶ COMPUTERS OR ARTICLES FOR STUDENTS READ
- ▶ ORGANIC AND NON-ORGANIC APPLES

STANDARDS

Science

- ◇ Changes in biodiversity can influence humans’ resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling.

Agriculture, Food, and Natural Resources

- ◇ Research and summarize different types of market demands for food products (e.g., local food, organic, non-GMO, etc.).
- ◇ Examine the impact of consumer trends on food products and processing practices (e.g., health and nutrition, organic, information about food products, local food movements, farm-to-fork supply chains, food system transparency, etc.).



(GRADE LEVELS 9-12)

HOW CAN PLANTS GROW WITH JUST WATER?

🕒 100 minutes



Learning Objectives

Students will understand the chemicals necessary for plant survival.

Students will create models to make sense of phenomena.

Background/Overview

Nutrients play a critical part to how plants grow and thrive. This lesson explores the different chemicals that plants need and how they use them. This lesson contains some references to chemical reactions and processes, so it may be helpful to team up with a chemistry teacher to find good resources for students to use for their research.

Activity

1. Show students the Flex Farm nutrient packs and explain that because the Flex Farm doesn't use soil, nutrients need to be added to the water so that plants can grow and live.
2. List the nutrients used in a hydroponic system. This should include macro- and micronutrients such as:

Nitrogen (N)	Phosphorous (P)	Potassium (K)
Sulfur (S)	Calcium (Ca)	Magnesium (Mg)
Iron (Fe)	Molybdenum (Mo)	Boron (B)
Copper (Cu)	Manganese (Mn)	Zinc (Zn)
3. Explain to the students that they will be creating an Element Poster that will give some information about each of the micro- and macronutrients that plants need. Pick one element to model what an Element Poster will look like. Some information that the posters could contain include:
 - a. The element name
 - b. The element number and atomic weight
 - c. Characteristics of the element
 - d. How the element is important to plants
4. Posters can also contain images including what the element looks like (if applicable), atomic models, and products made with the element.
5. Have students get into groups of two or three. Either let students choose or assign an element to each team.
6. Students should research their element and create their Element Poster.

Assessment

Have students present their posters to the rest of the class, explaining what their element is and how it relates to plant functioning.

Materials/Preparation

- ▶ FLEX FARM
- ▶ EXAMPLE PLANT NUTRIENTS PACKS
- ▶ CHART PAPER OR POSTER BOARD
- ▶ MARKERS
- ▶ COMPUTERS OR REFERENCE BOOKS ON PLANT NUTRITION
- ▶ EXAMPLE ELEMENT POSTER

STANDARDS

Science

- ◇ Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- ◇ Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.

ELA

- ◇ Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

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