



LITTLE
ENGINEERS

CAN DO!

LESSON PLANS, READINGS & ACTIVITIES

LIFE SCIENCE

LIFE SCIENCE

SPROUTS

GRADE LEVEL: 3 | TIME REQUIREMENT: 1-2 HOURS

INTRODUCTION

Among the earliest things elementary science students learn is what is living and what is not. From there, students start to learn about life cycles and the reproduction of living things. Plant life cycles are more complex than those of many animals, and the concept of a seed being alive can be a challenging idea.

OBJECTIVE

In this activity, students will observe the germination of seeds. Using seeds of common foods, students will be presented with an intriguing case that connects the ideas of plant anatomy and structure to food and nutrition. By making their own observations and diagrams, students will be actively working like scientists as they learn the concepts.

STANDARDS

NGSS DCI LS1.B
Growth and development of organisms.

NGSS SEP
Developing and Using Models.

NGSS CCC
Patterns.

CCSS RI.3.7
Using information gained from illustrations.

PERFORMANCE EXPECTATIONS

3-LS1-1
Developing models to describe that organisms have unique and diverse life cycles but all also have in common birth, growth, reproduction, and death.

HOW TO USE THIS RESOURCE

After reading the story about a real WWII situation with students and discussing it with them to ensure their understanding, lead them through observations of seed germination.

Materials (per group or station)

- Glass canning jars or empty food jars (for example, pickles or pasta sauce, thoroughly rinsed)
- Cheesecloth, thin napkins, or paper towels
- Canning jar ring lids, or rubber bands
- Seeds (use dried beans, lentils, or seeds for gardening, or sprouting seeds)

Instructions

1. Place the seeds in the bottom of the glass jar. Use just enough seeds to cover the bottom of the jar.
2. Fill the jar with room temperature water and let sit overnight.
3. After the seeds have soaked overnight, cover the mouth of the jar with the cloth or paper, and then screw the ring lid onto the jar. You may also alternately use rubber bands to hold the cloth or paper onto the jar.
4. Open the jar and pour the water out, leaving the seeds inside.
5. Twice daily, morning and afternoon, fill the jar with water and swirl the seeds around before pouring the water out.
6. Observe the seeds daily to see what happens. Record the data in the table. Because not all types of seeds will sprout at the same rate, record the dates of any changes.
7. When the seeds begin to sprout, carefully take one or two of the sprouting seeds out. Have students draw a picture of the sprouts and label what they see.

If edible seeds begin to sprout, the students can taste them. You could bring sprouts or microgreens from the grocery store to show and compare with the sprouts that the students are growing.

ADDITIONAL RESOURCES

To accompany this lesson, try these books:

+ *From Fruit to Flower*,
by Richard Konicek-Moran and Kathleen Konicek-Moran

+ *Notable Notebooks*,
by Jessica Fries-Gaither

READING

SPROUTS

In many places during World War II, there was a shortage of many kinds of foods. Because the United States had to ship food to millions of its men and women in the military overseas, there was not always enough food for Americans who stayed at home. During the war, there were even limits on how much butter, meat, sugar, and even chocolate that families could buy.

The United States also had shortages of fuel and gas. Because some foods like vegetables had to be shipped from farms where they were grown to cities and grocery stores, there were sometimes shortages of vegetables too. Families were encouraged to grow Victory Gardens. These were gardens grown in extra space in yards or neighborhoods where people could grow their own food to eat. These activities were not something new to many Americans because they'd had to do something similar in the years leading up to World War II, years known as the Great Depression. The Great Depression was a time when many people were out of work, and food prices were high as a result of years of bad weather patterns. During this time, people often grew their own food gardens, so it made sense to ask families to plant Victory Gardens during World War II.

Would you and your family be able to grow some or all of your own food? Would you know how to grow your own food? There is a special kind of magic in eating something that you grew yourself. Though it may seem like magic, it's actually science!

NAME:**DATE:**

Victory Gardens were part of everyday life for Americans on the Home Front during World War II. Families in both rural areas and in cities used the extra spaces that they had available to create their own gardens to grow their own food. Knowing how and when to plant your seeds so that you could nurture sprouts into an adult plant was important. Have you ever sprouted seeds or grown anything before? Let's investigate the first steps in growing vegetables.

Your teacher will give you materials and directions. Follow the instructions. Be careful with the materials. Before you make observations, say or write down what you think will happen. Draw pictures of what you see. After the activity, decide if your predictions were correct or incorrect. Discuss with your classmates what is happening and try to explain it out loud or written down. Record your data neatly so that you can learn from your experience.

TYPE OF SEED	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5

LOYAL FORCES

GRADE LEVEL: 1 | TIME REQUIREMENT: 2-3 HOURS

INTRODUCTION

This activity allows students to investigate how sounds in elementary school, students learn about the characteristics of different animals and how the special features of certain animals help them survive in their specific environments. Domesticated animals in the form of family pets are a specific example we can use to guide student learning about this idea. Humans have intentionally bred certain features into domesticated animals. Also, humans have taken wild animals and have selected the features that would help these animals in their roles working alongside people.

OBJECTIVE

In this activity, students will look at cases of animals that were used for different tasks during World War II. Noticing how the features of animals are useful for their survival and how these features might be useful to humans, students will apply what they know just as scientists and engineers do.

STANDARDS

NGSS DCI LS1A
Structure and function.

NGSS SEP
Engaging in argument from evidence.

NGSS CCC
Structure and function.

NCSS RI.1.10
With prompting and support, reading informational texts appropriately complex for their grade level.

NCSS W.1.7
Participating in shared research and writing projects.

PERFORMANCE EXPECTATIONS

1-LS1-1
Using materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

HOW TO USE THIS RESOURCE

Read the stories about a real WWII situation with students and discuss it with them to ensure their understanding. After students read the stories and look at the pictures, lead them to answer the questions in the data table. Students need to identify the relevant characteristics of the animals in the stories (for example: 1. pigeons can fly, 2. pigeons can find their way back to their home roost or nest, etc.) and need to be able to describe how these characteristics made the animals useful in the situation described.

Finally, have students think of other animals they know. What features do those animals possess that could make them useful? What jobs do people still use animals to help with today?

Materials (per group or station)

No materials other than the handouts below are needed, but photos of animals in service might help.

Instructions

1. Students will read the WWII story and will then fill out the table using information they know or look up.

ADDITIONAL RESOURCES

To accompany this lesson, try these books:

+ *Loyal Forces*,
by Toni Kiser and Lindsey Barnes

+ *What would you do with a tail like this?*
by Steve Jenkins and Robin Page

READING

LOYAL FORCES

On June 6, 1944, during World War II, there was a large invasion from England to Normandy, France. June 6 was code-named D-Day. The very first news from the D-Day invasion of Normandy was carried back to England by Gustav. Gustav was a messenger pigeon brought to the battlefields in France by a news reporter. On the morning of June 6, 1944, Gustav flew 150 miles north from Normandy, then all the way across the English Channel to Portsmouth, England. It took Gustav five hours to fly back to England.

Man's best friend was also put to service during World War II. Rip was a stray dog that rescuers in England used to save people who were trapped under rubble when bombs destroyed buildings in London. Rip found trapped survivors and helped get them to safety. Jet was another rescue dog. She was so good at rescuing

trapped people in London that soldiers took her to Germany to help to free trapped people there too after bombs were dropped.

Another four-legged service member was Bryn Awryn, a chestnut horse with a white patch on his nose. He carried soldiers into battle in the Philippines, and this was one of the last times the United States used horses in battle. The horses were good at traveling quickly in areas where jeeps and trucks couldn't go.

Animals have been helping humans with jobs, in peacetime and wartime, for thousands of years. Think about an animal you know. Now think of a job or task. What can these animals do that might make them useful for this task? Is there an animal that might be more useful or better at this job? Which animal would you pick to help you with each job?



This is Chick, a mule in service in the Army, working in China. 1945.
(Image: The National WWII Museum, 2002.210.022.)

NAME:

DATE:

During World War II, soldiers and civilians used animals to help them with a wide range of jobs. Each animal had characteristics or skills that made certain jobs a natural fit for them when it came to assisting humans. Look at the animals listed below. Write down what abilities, skills or features the animal has and what makes those skills or features useful.



US soldier holds a carrier pigeon. It has a tube on its leg to carry tiny coded messages. Italy December 1943.
(Image: The National WWII Museum, 2021.337.283.)



US Soldier reads a message brought to him by Rex. Italy, November 1944.
(Image: The National WWII Museum, 2007.048.470.)

ANIMAL	WHAT THE ANIMAL HAS	HOW IT'S USEFUL
Horse/Mule		
Dog		
Pigeon		

1. How do these animals help people today?
Do we still use them for the same kinds of jobs?

2. What are some other animals you know about? Pick an animal that you know about and explain how the animal helps people do or make something. What does the animal have that makes it good for that job?