TCM Teacher Created Materials

# 180 DAYS™

# Lessons and Activities

## Hands-On STEAM for Grade 1

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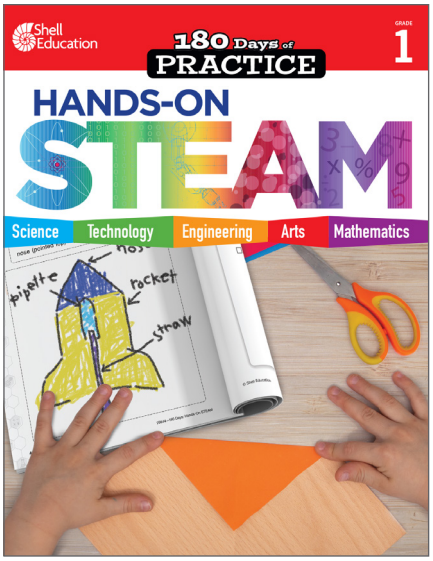


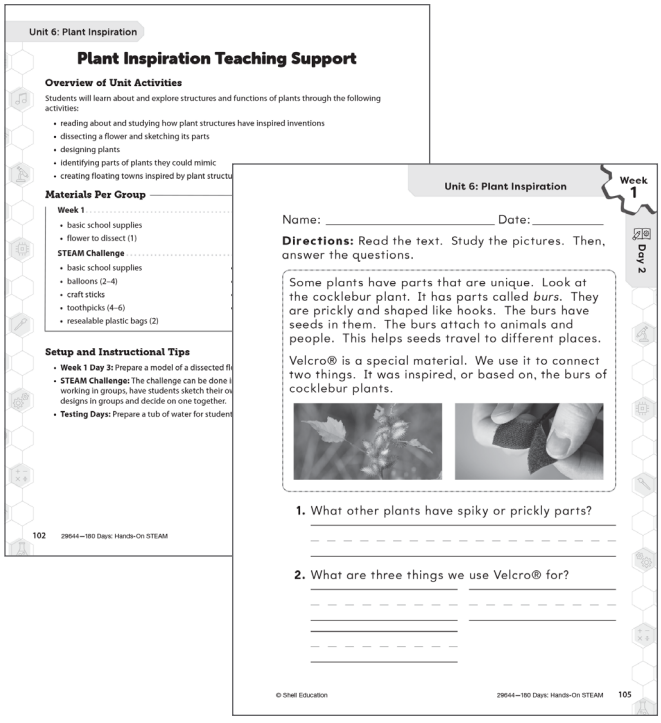

Shell Education

# 180 Days of PRACTICE

GRADE 1

# HANDS-ON STEAM

Science | Technology | Engineering | Arts | Mathematics

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# Plant Inspiration Teaching Support

## Overview of Unit Activities

Students will learn about and explore structures and functions of plants through the following activities:

- reading about and studying how plant structures have inspired inventions
- dissecting a flower and sketching its parts
- designing plants
- identifying parts of plants they could mimic
- creating floating towns inspired by plant structures

## Materials Per Group

**Week 1**

- basic school supplies
- flower to dissect (1)

**STEAM Challenge**

- basic school supplies
- balloons (2–4)
- craft sticks
- toothpicks (4–6)
- resealable plastic bags (2)
- small toy people (3–5)
- straws (2–4)
- timer
- tub of water

## Setup and Instructional Tips

- **Week 1 Day 3:** Prepare a model of a dissected flower to show as an example.
- **STEAM Challenge:** The challenge can be done individually or in groups. If students are working in groups, have students sketch their own designs first. Then, have them share designs in groups and decide on one together.
- **Testing Days:** Prepare a tub of water for students to test their floating towns.

## Discussion Questions

- What are some external structures of plants?
- How do plants survive in different environments?
- What plant parts help protect plants?
- What are some of your favorite plants?
- What can we learn from different plants and their structures?
- What inventions were inspired by plant structures?

## Additional Notes

- **Possible Misconceptions:** Plant parts that look pretty (such as petals) do not serve a purpose.
- **Truth:** All plant parts serve a purpose. Even looking pretty is serving a purpose if it attracts pollinators.
- **Possible Design Solutions:** Students might try to create pockets of air with balloons or plastic bags to help their towns float. They might make the parts of their towns shaped like the leaves of water lilies. They might connect the town with craft sticks or straws.

## Scaffolding and Extension Suggestions

- Allow students to first create floating cities with only one part.
- Challenge students to use at least two different methods to make their towns float.

## Answer Key

**Week 1 Day 1**

dandelion—parachute
briar patch plant—barbed wire
tree—umbrella
leaf—solar panels

**Week 1 Day 2**

1. Examples: cactus, rose
2. Examples: shoes, pants, bags/backpacks, straps

**Week 1 Day 5**

1. Answers may include cactus spines or rose thorns.

**Weeks 2 & 3**

See STEAM Challenge Rubric on page 221.

Name: _____ Date: _____

**Directions:** Read the text. Draw lines to match the plants to the inventions.

Plants are made of different parts. These parts help them live. They help them survive in different places. Plants have roots, stems, and leaves. Some plants have flowers. Some flowers grow fruit. Plants can inspire new ideas. They can help us solve problems.

## Plants

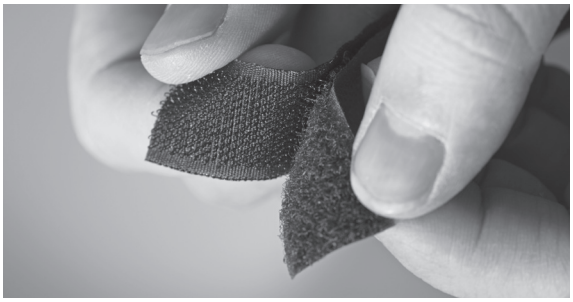
## Inventions

Name: _____ Date: _____

**Directions:** Read the text. Study the pictures. Then, answer the questions.

Some plants have parts that are unique. Look at the cocklebur plant. It has parts called *burs*. They are prickly and shaped like hooks. The burs have seeds in them. The burs attach to animals and people. This helps seeds travel to different places.

Velcro® is a special material. We use it to connect two things. It was inspired, or based on, the burs of cocklebur plants.



**1.** What other plants have spiky or prickly parts?

_____

_____

**2.** What are three things we use Velcro® for?

_____ _____

_____ _____

_____

_____

Name: _____ Date: _____

**Directions:** Take apart a flower. Look at all the parts. Sketch each part. Then, answer the questions.

**1.** What are the colors and textures of the flower?

**2.** What is the shape of the flower? How might the shape be helpful?

## Talk About It!

How could you mimic, or copy, parts of the flower to make something new?

Name: _____ Date: _____

**Directions:** Design your own plant. Complete the sentences. Draw it, and label the parts of your plant. Be creative!

My plant lives _____.

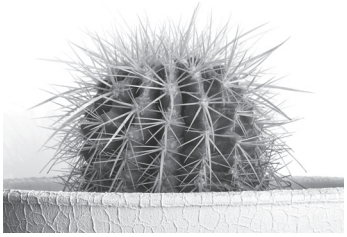
The name of my plant is _____.

My plant is special because _____

_____.

Name: _____ Date: _____

**Directions:** Study the pictures. Look closely at the plant parts. Write which part you would want to mimic. Then, answer the question.

| Plant | Picture | Useful Part to Mimic (copy) |
|---|---|---|
| rose |  | |
| cactus |  | |
| tree |  | |
| water lily |  | |

**1.** You want to make some type of protection. Which plant and part could you mimic?

_____

_____

Name: _____ Date: _____

**Directions:** Read the text. Then, study the example.

# The Challenge

Design a town that can float on water. Make a model of your floating town.

**Criteria**

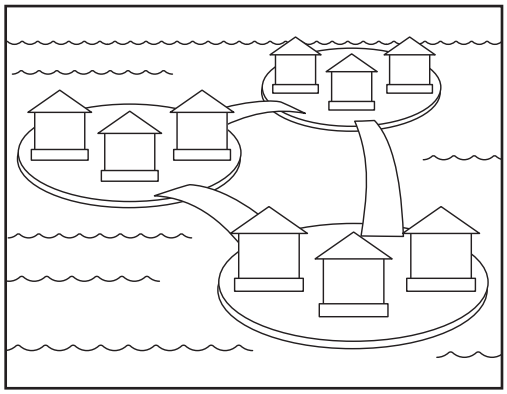
- Your design must use ideas from parts of a floating plant.
- Your design must float in a tub of water.
- Your design must have three parts that connect. Each part must float on its own.

**Constraint**

- You may only use the materials you are given.

## Example

This is a design for a floating city. Can you see the different parts? They float on their own. They connect to each other with bridges.

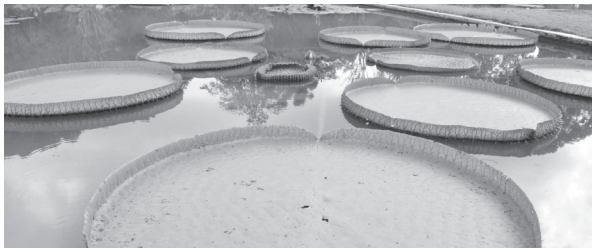


## Talk About It!

What questions do you have about this challenge?

Name: _____ Date: _____

**Directions:** Plants that float have special parts. Read the text about floating plants. Study the pictures. Then, answer the questions.

| Fresh Water Plant | Saltwater Plant |
| --- | --- |
|  |  |
| Water lilies have air in their leaf veins. It helps them float. The leaf shape and size also help it float. | Kelp has small, round parts that have air inside. They help it float. |

**1.** How could you use air in your design?

**2.** How could you use the plant shapes in your design?

Name: _____ Date: _____

**Directions:** Sketch your floating town design. Write the materials you plan to use.

## Materials

Name: _____ Date: _____

**Directions:** Write who will do each job. Add jobs if you need to. Then, build your floating town. Check off the jobs as you complete them.

| ✓ | To Do List | Student Name(s) |
|---|---|---|
| | Gather materials. | |
| | Make part one. | |
| | Make part two. | |
| | Make part three. | |
| | Measure and cut materials. | |
| | Tape and glue parts. | |
| | | |

**Quick Tip!**

It is okay to do a few mini tests as you build! Get a bowl of water. Check that each part floats.

Name: _____ Date: _____

**Directions:** Place your floating town in a tub of water. Wait at least 1 minute. Then, answer the questions.

| Does your floating town... | yes/no |
|---|---|
| float? | |
| have a plant-like structure? | |
| have three parts? | |
| include ideas from all team members? | |

## Try This!

The ocean is not always calm. Move the tub back and forth a little. Does your town still float?

Name: _____ Date: _____

**Directions:** Think about your floating town. Answer the questions. Then, plan how you will improve it.

**1.** What part of your design worked well?

**2.** What do you need to change or add to make it better?

## New Criterion Alert!

Each part of your town must support a small toy person. They must stay afloat. You will add them when you retest your design.

**3.** What do you need to add or change to meet this new criterion?

Name: _____ Date: _____

**Directions:** Sketch your new design. Circle the parts that are new or different. List any new materials you will use.

## Materials

Name: _____ Date: _____

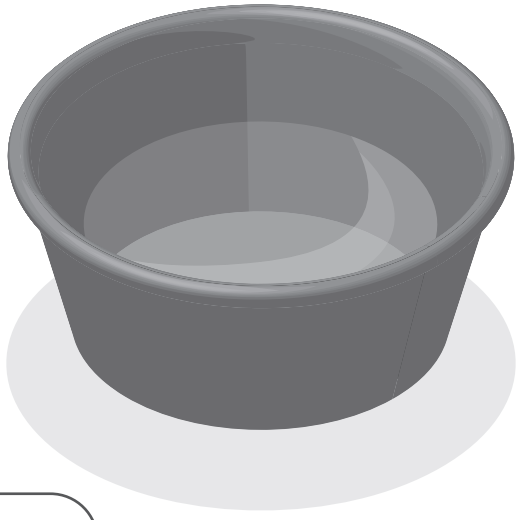
**Directions:** Rebuild your floating town. Make it better. Use this chart to help you.

| ✓ | To Do List | Student Name(s) |
|---|---|---|
| | Gather new materials. | |
| | Change or remove unwanted parts. | |
| | Add new features. | |
| | Measure and cut materials. | |
| | Tape and glue parts. | |
| | | |
| | | |
| | | |

Name: _____ Date: _____

**Directions:** Place your floating town in a tub of water. Place a small toy person on each part of your town. Wait at least 1 minute. Then, answer the questions.

| Does your floating town... | yes/no |
|---|---|
| stay afloat with the people on it? | |
| have a plant-like structure? | |
| have three parts? | |
| include ideas from all team members? | |



## Try This!

The ocean is not always calm. Move the tub back and forth a little. Do the toy people stay on?

Name: _____ Date: _____

**Directions:** Think about how you worked on this challenge. Give your town a name. Draw yourself in your town.

**Town Name:** _____

## Talk About It!

What would be fun about living in a floating town?

What would be hard about living in a floating town?