



Communities  
In Schools  
San Antonio

# STEM SPACE



AT HOME

Plants in Space  
Challenge



A weekly video series with a fun STEM challenge, led by an engineer, and using materials you can find at home.

#STEMspaceathome

## STEM Space At Home Activity Guide

Thanks for joining the STEM Space At Home challenge! Here is how to participate:

1. Watch the engineering challenge video and mission overview: [Click here to watch the video](#) and view additional resources.
2. Use the following activity guide to complete the challenge.  
Option 1: Print the following pages.  
Option 2: Use the editable Google Slides (see below).
3. Post and view other designs using #STEMspaceathome.

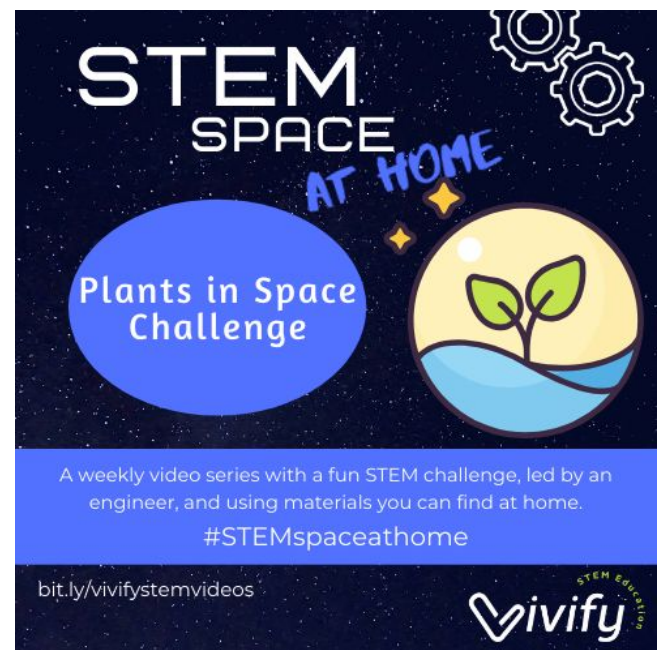
### Editable Google Slides Teacher Instructions

1. Click the link for the Google Slides link at the bottom of this page.
2. Sign into your Google Account and **MAKE A COPY** when prompted.
3. Save an original copy on your own google drive and then make a separate copy for your students to edit. Keep your original file.
4. Your students will need to make their own copy when you share the file with them. \*Students will need their own Google accounts to use the Google slides and may do so on an iPad or iPhone using the free Google Slides App.\*

#### Tips for using Google Slides:

1. To DELETE a slide, right-click the slide on the left-hand side preview and click DELETE SLIDE.
2. To DUPLICATE a slide, right click on the slide in the left-hand side preview and click DUPLICATE SLIDE.
3. To PRINT slides, click FILE and then PRINT.

[Click on this link or the image to the right to access the editable Engineering Design Process Google Slides Worksheets](#)



## Miniature Greenhouse Materials

- Sandwich size resealable baggie
- 2 cotton balls
- 2 seeds



## Miniature Greenhouse Instructions

1. Prior to this activity, gather seeds. Soak dry beans in water at least overnight to jumpstart their growth. Other seeds may work as well. Acorn/spaghetti squash or pumpkin seeds have a decent growth rate. You can also use flower seeds, popcorn kernels, or dandelion seeds. Using two seeds for each student insures the likelihood for good results from at least one seed but is not necessary.
2. Put each cotton ball into tap water. Let excess water drip off before adding them to the baggie but do not squeeze them.
3. Place one bean on each cotton ball inside the baggies, making sure to separate the cotton balls to allow each seedling plenty of growing room. Consider placing the seeds on opposite sides of the cotton balls (facing outside and facing inside) so you can see if there is a difference in growth. Which one do you think will grow faster? Taller?
4. Seal the baggie closed, but do not squeeze out any air. Now your baggie is ready to hang in a window or to be supported by the device you create in the engineering design challenge.




# Engineering Design Process

**1**  
 Identify the Problem

**2**  
Brainstorm 

**3**  
 Design

**4**  
Build  
Test & Evaluate  
Redesign



**5**  
Share Solution 

## Identify the problem



What is the goal of the challenge?

**Mission:** Design a device to support your plant that will keep it upright and allow a full view of the sun.

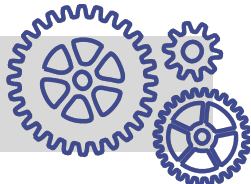
List any constraints:

## Brainstorm

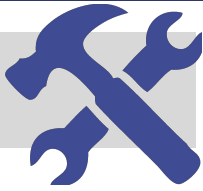
List available materials and how they may be used to solve the problem.



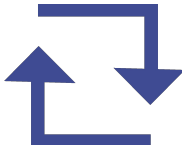
## Design



How will you solve the challenge? Sketch your design solution below. Label all parts and materials.

**Build**

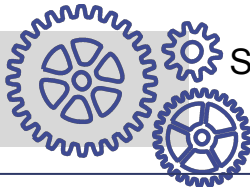
Time to build your solution! Keep in mind that materials may not work as you predicted. Engineers often have to make several modifications to their original design before they are successful. List any challenges you experience during the building phase.

**Test & Evaluate**

Test your design and record results below. Circle if the challenge was a success. Remember that failure is an important part of the engineering process! After each trial, review the results and make changes to improve your design.

Trial	Test Results	Ideas for Improvement
1		
2		
3		
4		

*Final Testing Results:*

**Solution**

Sketch your final design and label materials used.

**Reflect & Share**

Answer the following questions. Then share design results with your family/class!

1. *What challenges did you face during the design process?*

2. *How does this challenge relate to a STEM career?*

# Thank You!

Thank you for downloading a Vivify product! If you have any questions, please email us at [info@vivifsystem.com](mailto:info@vivifsystem.com).

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## About Vivify

Vivify is a team comprised of two Aerospace Engineer friends, Natasha and Claire, who live in Texas. We met as college classmates and roommates at Texas A&M University and later left engineering careers in the Department of Defense and Air Tractor to pursue our passion for STEM education. Learn more of our story [here](#).

Our goal is to bring engineering to life—to vivify learning—for kids of all ages. Please connect with us so we can learn how to better serve your students!

- Natasha & Claire, The Vivify Team



## Connect with us for free STEM resources!

Subscribe to our newsletter and receive access to a library of free STEM resources through [www.vivifsystem.com](http://www.vivifsystem.com). Follow us on social media or listen to “The STEM Space” podcast for more resources and ideas. We also welcome you to join [“The STEM Space”](#) Facebook group to connect with other educators across the world.



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