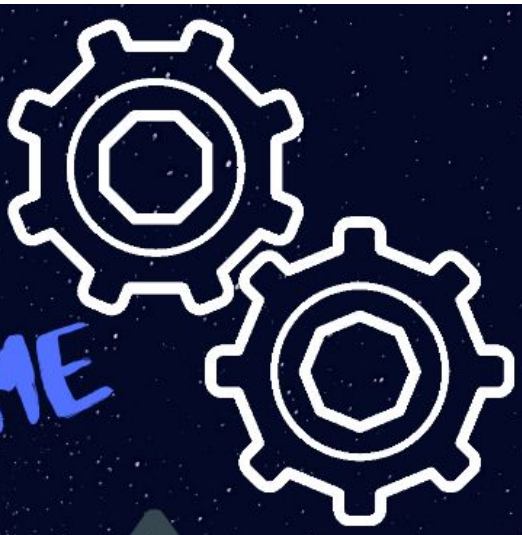
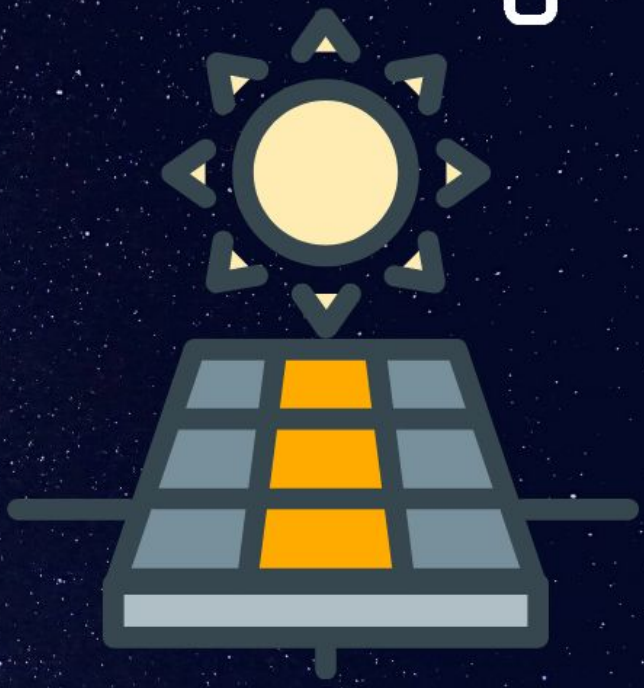
STEM SPACE AT HOME



Moon Solar Tower Challenge



#STEMspaceathome

NEW WORLDS AWAIT YOU

WEX FOUNDATION
ADVANCING CAREERS IN SPACE

NASA Partner

Vivify STEM Education

STEM department
Communities In Schools San Antonio

Teacher Notes

STEM Space At Home Activity Guide

How to use STEM Space At Home:

1. Print the following student activity pages.
2. Have students watch the engineering challenge video and mission overview: Click here to watch the video and view additional resources.
3. Students use the activity guide to complete the engineering design challenge. Students can upload their completed design via Flipgrid. Teachers will need to create a Flipgrid account and topic board. More details at flipgrid.com. If not using Flipgrid, let students know to ignore the Flipgrid notes on the guide.
3. Post and view other designs using #STEMspaceathome.

Digital STEM Journal: Flipgrid

Flipgrid is a platform to share videos of design solutions. Teachers can moderate responses for a safe environment that builds community. Below is an editable template to help students with a script for their video. This can be combined with the printed or Google Slides journal.
https://blog.flipgrid.com/gettingstarted

Click for link to editable student handouts.

Engineering Design Process

1

Identify the Problem

2

Brainstorm

3

Design

4

Build

Test & Evaluate

Redesign

5

Share Solution

Welcome Tower Challenge

Name:_____

1

Your Mission: Build a welcome tower for your lunar base powered by the sun!

Go to Flipgrid for mission instructions. Code:_____

2

First, create a welcome sign from a piece of construction paper at least 2 in x 2 in or 5 cm x 5 cm. The sign should include the name of your lunar base.

Engineering Design Rules

- ❑ Sign has an LED light attached.
- ❑ Sign must be raised at least 1 foot (30 cm).
- ❑ Base is a paper plate.
- ❑ Solar panel must have full exposure to the sun.

Bonus: Allow for the solar panel to face different directions based on the location of the sun.

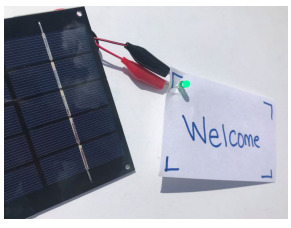
Gather Materials Needed

- ❑ Scissors
- ❑ Tape & Ruler
- ❑ 3, 5 oz cups
- ❑ 3 sheets of paper
- ❑ 1 paper plate
- ❑ 7 bendy straws
- ❑ 1 solar panel OR coin cell battery
- ❑ 1 LED light

3

Brainstorm ideas for your design. Draw at least one idea below.

How will you use provided materials to build a welcome tower powered by the sun? Brainstorm ideas for different designs. Keep in mind that a sturdy base is critical for a strong tower.



As you build, make sure your device meets the engineering design rules above!

4 **Build**

Welcome Tower Challenge

5

Test → Evaluate → Improve

Test your welcome tower! Place your tower in direct sunlight. Can you go higher?

Trial	LED light turns on	Height of sign	Solar panel rotates	What improvements can you make?
1	Yes / No		Yes / No	
2	Yes / No		Yes / No	
3	Yes / No		Yes / No	

What is the height of your welcome tower sign?

6

Share your solution on Flipgrid!

Write out a script below answering each prompt. Go to Flipgrid using the same code, and record a response to share your design.

1: Share your design! How does it work?	2: What happened during building & testing?

WANT MORE STEM?

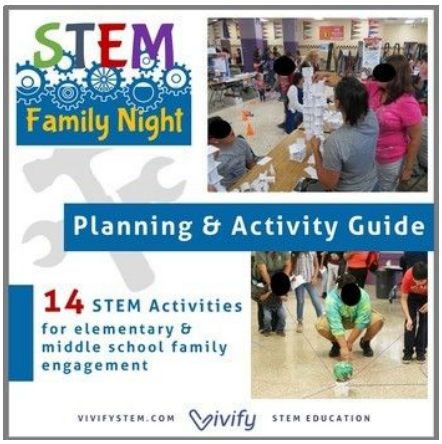
For a complete list of all of Vivify STEM resources broken down by standards, topics, and grade levels, go here: bit.ly/VivifyResourceGuide

bit.ly/VivifyMars

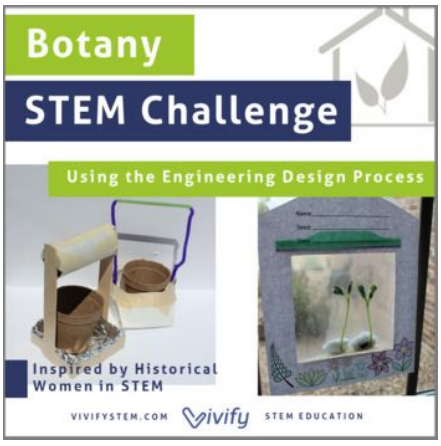
bit.ly/Vivifyspacebundle

bit.ly/icebreakerbundle

bit.ly/Vivifycatapult



bit.ly/STEMfamilynight



bit.ly/Vivifybotany

Vivify's Overview of STEM Education

Successful STEM education is an empowering interdisciplinary approach that brings math and science concepts to life through problems that mimic the complexities and excitement of the real world. STEM revolves around the Engineering Design Process that embraces failure, relies on teamwork, and requires critical thinking and creativity. While exciting, educators often become intimidated as a search for curriculum leads to an overwhelming range of activities from index towers to robotics competitions. At Vivify, we believe that not all STEM is created equal. Educators should adopt a 3 Stages of STEM approach by progressively building towards more complex projects.

To learn more about the 3 Stages of STEM, go here: http://bit.ly/stemstages

Launchpad Mars

Want a complete STEM curriculum focused on space? Check out our Mission to Mars and Mission to Moon series for elementary and middle school projects: https://www.vivifystem.com/blog/2019/6/13/mission-to-mars-launch-kids-into-stem

Thank You!

Thank you for downloading a Vivify product! If you have any questions, please email us at info@vivifystem.com.

Terms of Use

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.vivifystem.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.

bit.ly/Vivifyig

bit.ly/Vivifyfb

bit.ly/Vivifytwitter

bit.ly/thestemspace