

Updated
October 2020

STEM EDUCATORS ACADEMY

ACTIVITY TOOLKIT



HYBRID LEARNING DESIGN CHALLENGES



[Plankton](#)



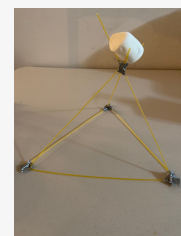
[DIY Weather Station](#)



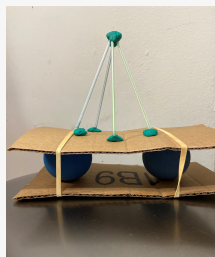
[Water Cycle](#)



[Climate Change STEAM](#)



[Spaghetti Marshmallow](#)



[Earthquake Proof Structures](#)



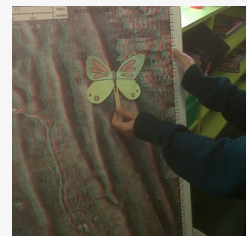
[Rube Goldberg Machines](#)



[Mineral Structures](#)



[Rockin' Rockets](#)



[Camou-flies](#)

STEM FACILITATION SKILL BUILDER VIDEOS



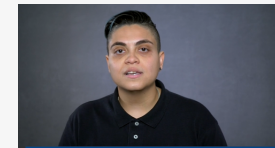
[Participation](#)



[Student Voice](#)



[Collaborative Teaching](#)



[Engineering Design Process](#)



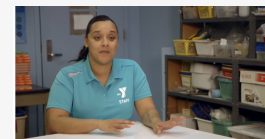
[Using Narratives in Design Challenges](#)



[Relevance](#)



[Questioning and Reflection](#)



[Inquiry](#)

MATERIALS LISTS AND SUPPLIERS

FOR HYBRID LEARNING DESIGN CHALLENGES

Bulk orders for multiple STEM activities

- Pipe cleaners
- Masking tape (1 roll for each student)
- Construction paper (1 stack for each student)
- Glue stick (1 for each student)
- Coloring tools set (crayon box, color pencil box or marker set for each student)
- Pen/pencil for each student
- 10 inch straws
- Modeling clay or playdoh (a workable ball for each student)
- Balloons
- Index cards
- Scissors (1 per student)
- Ruler or measuring tape
- Thick rubber bands
- String (1 large roll that can be cut into smaller lengths for activities)
- An assortment of fasteners of various sizes (paper clips, binder clips)

Items for one-time projects

- Spaghetti
- Marshmallows
- Pack of sponges

Items to organize class activities

- Paper lunch bags or clear plastic baggies

Items youth may have at home

- Small jars (ex. Baby food jar, 1 per student)
- Scrap cardboard (save boxes)
- Heavy plastic plates or reusable plates (2 for each student)
- An assortment of fasteners of various sizes (paper clips, binder clips)

SUPPLIERS

- *For bulk orders*
 - [Webstaurantstore](#)
 - [ULINE](#)
 - [S&S Worldwide](#)
- *For STEM-specific orders*
 - [Pitsco](#)
 - [Carolina Biological](#)
 - [Acorn Naturalists](#)

ADDITIONAL RESOURCES



[Virtual Facilitation:
Tips and Tools](#)



[Training Slideshows](#)

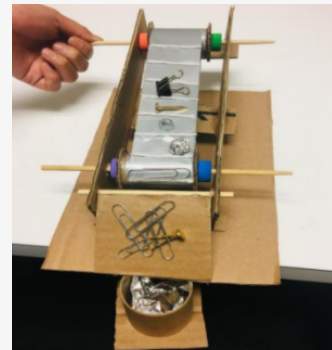


[More Trainings from
ExpandedED Schools](#)

ORIGINAL DESIGN CHALLENGES BY CONTENT AREA

ELECTRICITY AND MAGNETISM

- [Magnificent Magnets](#)
 - [Student Worksheet: Magnet Strength Test](#)
 - [Student Activity Prompts for Stations](#)
- [All Charged Up](#)
 - [Student Worksheet: All Charged Up](#)
 - [Student Worksheet: Static Electricity](#)
- [Squishy Circuits](#)
 - [Student Worksheet: Squishy Circuits](#)
- [Wiring a House Design Challenge](#)



Magnetic Recycling Sorter
sample from
Magnificent Magnets

ENGINEERING AND ENERGY TRANSFORMATIONS

- [Yeastie Beasties](#)
- [Salt Sensation Lab](#)
 - [Student Worksheet: Rock Salt Worksheet](#)
 - [Student Worksheet: Heat/Ice Pack Worksheet](#)
- [Blackout Cooler Design Challenge](#)
 - [Station Activity Sign: "Making the Mitts"](#)
- [Solar Oven Design Challenge](#)



"Making the Mitts"
from Blackout Cooler Design
Challenge

ECOSYSTEMS

- [Finch Beak Race](#)
 - [Student Worksheet: Raw Data](#)
 - [Student Worksheet: Data Graph](#)
- [Hunger Game Content Lesson](#)
- [Hunger Game Design Challenge](#)
 - [Student Worksheet: Game Design](#)
- [Prosthetic Beak Design Challenge](#)
- [Spider Web Design Challenge](#)



Prosthetic Beak
Design Challenge
sample

DIVERSITY OF LIFE

- [Gliding Animal Design Challenge](#)
 - [Student Worksheet: Gliding Animal Design](#)
- [Jitter Critter Challenge](#)

ENERGY AND MATTER

- [AirZooka Design Challenge](#)
- [Chem Car Design Challenge](#)
- [Pom-pompei Volcano Design Challenge](#)
- [Slime Design Challenge](#)

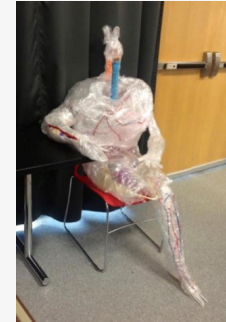
ORIGINAL DESIGN CHALLENGES BY CONTENT AREA

GEOLOGY

- [Edible Earth Contest](#)
- [Mineral Madness Content](#)
- [Mineral Structures Design Challenge](#)
- [Pom-pompei Volcano Design Challenge](#)
- [Spaghetti Marshmallow Design Challenge](#)
 - [Student Worksheet: Spaghetti Marshmallow](#)
- [Earthquake Bridge Design Challenge](#)

DYNAMIC EQUILIBRIUM: THE HUMAN ANIMAL

- [Choreo Graph Design Challenge](#)
- [Paralympics Wheelchair Design Challenge](#)
- [Rube Goldberg Design Challenge](#)
- [Saran Wrap Mannequin Design Challenge](#)
- [Zombie Apocalypse Design Challenge](#)



[Saran Wrap
Mannequin
Design Challenge](#)

DYNAMIC EQUILIBRIUM: OTHER ORGANISMS

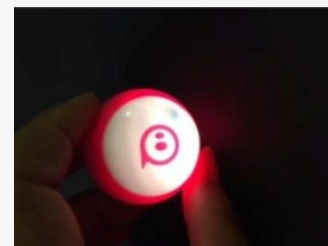
- [Battle Bug Design Challenge](#)
- [Dogfish Shark Dissection](#)
- [Owl Pellets Dissection](#)
- [Pet Mobile Design Challenge](#)
- [Plant Hydraulics Design Challenge](#)
- [Robo Bee Design Challenge](#)



[Robo Bee
Design Challenge](#)

ENERGY, FORCES & MOTION

- [Newton's Law Stations](#)
 - [Newton's Law Worksheets](#)
- [Duct Tape Pirate Ship Design Challenge](#)
- [Gliding Plane Design Challenge](#)
 - [Student Worksheet: Glider Challenge](#)
- [Ski Jump Design Challenge](#)
 - [Student Worksheet: Ski Jump Design Challenge](#)
 - [Student Reading: Projectile Motion](#)
- [Sphero Design Challenge](#)



[Sphero
Design Challenge](#)

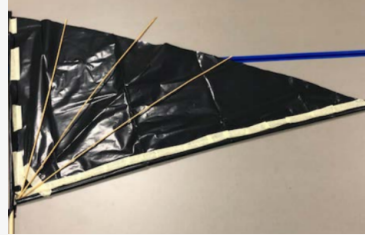
THE SUN, EARTH & MOON SYSTEMS

- [Constellation Creations](#)
- [Cosmic Sculptures Design Challenge](#)
- [Moon Motions Content Lesson](#)
- [Moonlight Laser Maze Design Challenge](#)
- [Rockin' Rockets Design Challenge](#)

ORIGINAL DESIGN CHALLENGES BY CONTENT AREA

EVOLUTION, NATURAL SELECTION & ADAPTATIONS

- [Camo-Flies](#)
- [Creature Feature Design Challenge](#)
- [Light Detective Design Challenge](#)
- [Fossil Making Design Challenge](#)
 - [Station Activity Signs: Fossil Making](#)
- [Arms Race Design Challenge](#)



Arms Race
Design Challenge sample

GROWTH, DEVELOPMENT AND REPRODUCTION OF ORGANISMS

- [You Got Cooties! My Pet Germ & Finding Patient Zero](#)
 - [Student Worksheet: Finding Patient Zero](#)
- [Delicious DNA](#)
 - [DNA Lab Protocol](#)
 - [DNA student worksheet](#)
- [Felt Moji Design Challenge](#)
 - [Student Worksheet: Phenotype Felting Planning](#)
- [Gene Machine Design Challenge](#)
- [Man Versus Germ Design Challenge](#)
 - [Student Worksheet: Man Vs. Germ](#)



Felt Moji Design
Challenge sample