



We hope you enjoy your **Future Engineers** Classroom STEAM Kit! Have a great time exploring Science, Technology, Engineering, Art and Math with these fun activities designed just for you.

This kit includes written instructions for the following activities included in the **Future Engineers** kit:

- UV Shelters
- Engineering Challenge Cards
- Teetering Towers

Visit our website [www.kidsdiscoveryfactory.org/classroomkitvideos](http://www.kidsdiscoveryfactory.org/classroomkitvideos) to follow along with us as we provide a step by step walk-through of the activities, or choose which activities to do when, based on your schedule.

Thank you for your continued support of Kids Discovery Factory.

**Materials Included:**

UV Beads (~20 beads per student)  
Pipe Cleaners (2 per student)  
Paper Plates (1 per student)  
Straws (5 per student)  
Craft sticks (10 per student)  
Foil Sheet (1 per student)  
Construction Paper (2 per student)  
Index Cards (5 per student)  
Craft Sticks(20 per student)  
Binder Clips (10 per student)  
Clothespins (1 sheet per student)  
Rubber Bands (~5 per student)  
Marshmallows (5 students worth per bag)  
Toothpicks (1000 per class)  
UV Shelters Worksheet (1 per student)  
Engineering Challenge Cards (1 set per student)  
Teetering Towers Shapes Worksheet (1 per student)



## UV Shelters

### Supplies:

- 20 Beads
- 2 Pipe Cleaners
- 1 Paper Plate
- 10 Craft Sticks
- 2 Construction Paper
- 1 foil Sheet
- \*Glue

### Directions:

#### Pre-experiment

Pass out the UV Shelter worksheet and complete it together. Then pass out beads and pipe cleaners.

#### Experiment



Start by building your pipe cleaner and bead animals.

If possible take bead animals out in the sun and notice the UV beads changing color. Have students notice the change in color. Ask why?



Talk about how we protect *ourselves* from the sun. Kids mentioned things like sun hats, sun glasses, long sleeves, umbrellas and sunscreen. Discuss how we could protect our beaded animals from the sun. Brainstorm ways to create various shelters using different materials

Challenge students to design and build structures for their beaded animals that would protect them from the sun.

Head back into the classroom and pass out the materials given to build a UV shelter for their bead animals. Have students build a UV shelter.

### **Post Experient**

Test by taking the UV shelters out into the sun. See if students shelter helps stop their bead animals from changing color from the sun's rays.

## **Engineering Challenge Cards**

### **Supplies:**

Rubber Bands  
Craft Sticks  
Straws  
Clothespins  
Binder Clips

### **Directions:**

#### **Pre-experiment**

Give students a copy of each challenge card. Choose which challenge card each students will work on first. Give each student one sheet of clothespins, 10 binder clips and 20 craft sticks, 5 straws and a few rubberbands.

#### **Experiment**

Set a time limit, review what each student has built. Deconstruct if needed and reuse materials for the next challenge card.



## **Post Experiment**

Set materials aside, highlight the trial and error process used when facing a challenge.

# **Teetering Towers**

## **Supplies:**

Marshmallows

Toothpicks

Teetering Tower Shapes Worksheet

## **Directions:**

### **Pre-experiment**

Pass out worksheet review with students the 2D and 3D shapes shown.

### **Experiment**

Pass out the marshmallows and toothpicks, first challenge your students to create as many 2D shapes as they can with their supplies.

Once students have experience building 2D shapes, challenge them to move on to creating a 3D tower. Let students know that you will be measuring their towers at the end of their time and the class will keep a tally of the heights. Have students make a prediction about how high their tower will be.

### **Post Experiment**

Find the highest tower, have the students share what worked well when building their tower and what they would change if they had to do the activity again.