

## **Engineering Lessons for Family Engagement (Resource Exchange)**

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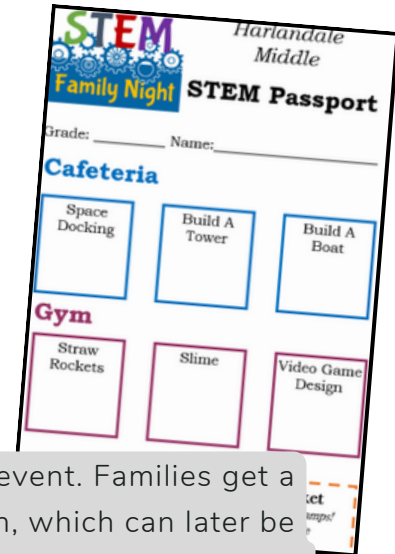
# Engineering Lessons FOR FAMILIES!

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PCEE DIV  
RESOURCE  
EXCHANGE**

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## HOST A STEM FAMILY NIGHT!

A STEM Family Night is an evening of hands-on science, technology, engineering, and math activities for students and families to complete together and works best for elementary campuses. We recommend 6 - 10 stations around the campus that are open for a “come and go” event. These activities are engaging for all ages with the goal of introducing STEM learning to families. Activity stations can be managed by teachers or by inviting local STEM professionals who can also share about their work. You may consider featuring STEM clubs such as robotics to set-up a booth.



Use “passports” to organize the event. Families get a stamp for completing each station, which can later be redeemed for a prize to increase participation.

## HOW TO CHOOSE ACTIVITIES

- Quick, hands-on activity that can be completed in under 10 minutes
- Accessible to all ages
- Opportunity to design and build
- Requires only a short list of readily available materials
- Wide-range of topics covered to cater to a range of student interests



The goal is to create an initial spark for STEM that is nurtured further in the classroom.

## ACTIVITY 1: SPACE DOCKING

Work as a team to transfer your astronauts to the International Space Station. The focus is on teamwork and introducing balanced and unbalanced forces. We love to show a video of a real space docking event at this station.

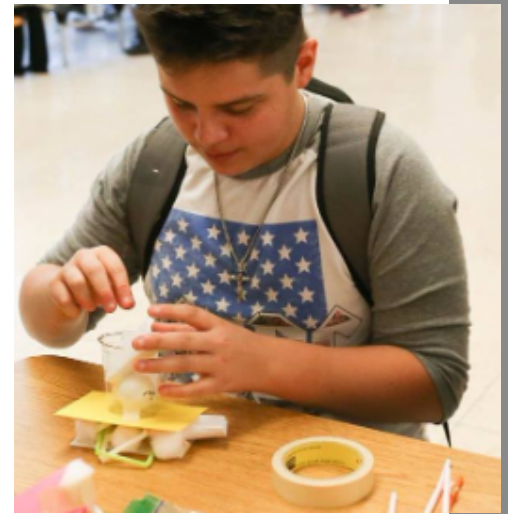
- PVC pipe: docking ring
- Ring
- Ball (astronauts)
- Rope



## ACTIVITY 2: SPACE LANDER

Design a lander that keeps ping pong ball safely inside the cup after impact. You can create a story line such as the ping pong ball represents astronauts landing on Mars.

- 1 9 oz plastic cup
- 2 ping pong balls
- 1 ¼ page cardstock
- 10 mini marshmallows OR 10 jumbo cotton balls
- 6 plastic flexible straws
- 6 index cards
- 1 scissor and tape



## ACTIVITY 3: CATAPULT

Use the stored elastic energy of rubber bands to make a catapult! You will need a ping pong ball and 9 oz cup for testing.

Building materials per student (approx.)

- 1 Plastic spoon
- 10 rubber bands
- 5 jumbo craft sticks
- 15 skinny craft sticks



## ACTIVITY 5: ROLLER COASTER

Design and build a roller coaster that has 3 turns and puts a ball in a cup. You may also add the constraint of time to keep the ball rolling for the longest amount of time within a given height.

- Scissors and tape
- Paper plates
- Construction paper
- Ping pong ball
- Cup



## ACTIVITY 6: HOOP GLIDER

Build and fly a glider made from a straw with hoop to travel the farthest distance.

- Scissors and tape
- Index card
- Straw

