

Exploring Engineering Fields Stations

<u>Engineering Field</u>	<u>Materials Needed</u>	<u>Goal of Station</u>	<u>Directions for Students</u>
Architectural Engineering	Per group: 1 container of blocks (variety of shapes and sizes)	Students will explore how engineers construct buildings by using different sizes and shapes of blocks to build the tallest tower.	At the architectural engineering station, you will be trying to use the blocks to build the tallest tower. You can test your tower's strength by blowing (testing wind) or slightly shaking table (earthquake). If your tower does not stay standing, modify your design and try again.
Aerospace Engineering	Per student/partnership: 1 coffee filter 2 pieces of string 1 cube or item to use as the person parachuting 2 paper clips	Students will explore how engineers design a parachute to carefully carry a person to the ground.	At the aerospace engineering station, your job is to design a parachute that can carry your block/person safely down to the ground. To test your parachute, hold your arm out shoulder height and drop. Make any necessary modifications and try again.
Ocean Engineering	Per student/partnership: 1 plastic container with lid 2 small magnets 1 testing tub with water 1 container of sand 1 bag of rubber bands	Students will design a submersible that can be pushed under water using one finger, collect a magnet on the bottom of the tub of water, and resurface.	At the ocean engineering station, your job is to design a submersible that can collect a magnet at the bottom of a tub of water. You will need to use one finger to act as the thrusters for your submersible when testing. You will need to design your submersible so it can submerge under water with the push of your finger, collect the magnet, and resurface. To accomplish this task, you will need to figure out a way to make your submersible sink and collect a magnet. You can use the second magnet at the station as an attachment for your submersible.
Civil Engineering	Per student/partnership: 1 small tub 1 pitcher of water 1 medium bag of rocks 5-10 square rock tiles (include a mixture: granite, limestone, marble, etc.)	Students will use a variety of materials to design a dam that can slow and possibly prevent water from moving from one side of the tub to the other.	At the civil engineering station, your job is to design a way to slow water flow and possibly even prevent it from getting to the other side of the tub. Using the materials at your table (rock tiles and rocks), design a dam that goes inside the small tub. When you are ready to test, pour the water from the pitcher in one side of the tub and observe what happens. Pour the water back into the pitcher and make any necessary modifications before testing again.
Chemical Engineering	Per group: *Can be premixed or allow students to mix each part Premade mixture of water and Borax with label (1 cup water for every 1 tbsp. of Borax) Premade mixture of 50% white glue and 50% water with label Measuring cups Ziploc bags (quart size)	Students will explore how mixing various ingredients together can create a new product.	At the chemical engineering station, you will learn how engineers make new products by mixing together various ingredients. You will need to mix ½ cup of each mixture into a Ziploc bag. Once you have combined both mixtures in your bag, seal it and mix it around with your hand. Observe what happens and discuss with your partner/group.