

Miner Rescue

In 2010, 33 miners were trapped 2,300 feet underground for 69 days in a coalmine in Chile. All of them survived owing to many factors, including well-designed rescue equipment. Your challenge is to create a tool that will help rescue a person (a ping-pong ball) from a mining shaft (a paper tube).

TEKS:

4.2A Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.

How To:

- 1. Tape the paper tube upright to the table so that it will not move and place the ping-pong ball inside of it.
- 2. Examine the paper tube and ping-pong ball. Brainstorm ideas that a rescuer might use in this situation and sketch your designs for a tool to help remove the ping-pong ball.
- 3. Create your rescue device using pipe cleaners, straws, craft sticks, rubber bands, a cup, and/or string. Make sure your device is light, portable, and durable.
- 4. Now it's time to test your device! Try to remove the pingpong ball from the tube. Does the tool drop the ball? How could you increase the friction to make it easier for the tool to grip the ball?
- 5. If your device does not work exactly how you planned, modify your tool to make it work. Redesign and test until your device works.

I Materials:

- 1 ping-pong/table tennis ball
- 1 paper tube that is 6-inches long with a 2-inch diameter (toilet paper tube or cardstock rolled and taped)
- 6 pipe cleaners
- 6 straws
- 6 craft sticks
- 6 rubber bands
- 1 3.5 oz. paper cup
- String
- Masking tape
- Scissors

6. Once you have successfully made your device work, see if you can make your tool work even better.



The STEM Explanation:

Engineers who design rescue equipment need to test their equipment to make sure it works, but they do not want to wait to test until an actual rescue. In order to be confident that the tool or device will work in an emergency, it must be tested under a wide variety of circumstances before a real-life emergency. Rescues have to be quick and efficient, yet each one is somewhat unique. If you are designing rescue equipment for a client, you want to make sure your equipment is versatile, durable, lightweight, and portable.

Career Connection:

Engineers design and develop many different things that help solve everyday problems. They use advanced math skills to design machines, bridges, electronics, and much more. There are several different types of engineers that specialize in certain areas such as electrical engineers, mechanical engineers, structural engineers, robotic engineers, etc.

Resource:

http://ef.engr.utk.edu/efd/diversity-2011/mites-2011/tti meeting 10.pdf

