

# Miner Rescue

In 2010, 33 miners were trapped 2,300 feet underground for 69 days in a coal mine in Chile. Everyone survived, largely owing to the well-designed rescue equipment. Multiple engineers are responsible for the creation and testing of such equipment. Before critical rescue situations arise, engineers assess the strengths and weaknesses of equipment to make sure it can hold up when it is needed.



## Congratulations!

You have been hired by Girlstart as a mechanical engineer to design rescue equipment. Create a piece of equipment that is sturdy and safe to allow for the most efficient rescue. Remember, Girlstart wants you to be creative and have fun! Use the materials list to brainstorm and sketch out your equipment prototype below.

### Materials:

- 1 Pencil
- 1 Piece of Yarn
- 1 Plastic Spoon
- 2 Pipe Cleaners
- 2 Rubber Bands
- 2 Toothpicks
- 3 Craft Sticks
- 3 Straws
- Tape

### Design Your Prototype Here:

What is the name of your rescue equipment?

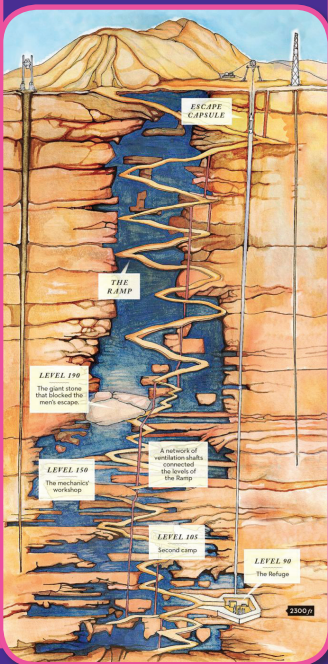
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What is your favorite part of your design?

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### Design Tips to Consider:

- In what type of environment could you use your rescue equipment?
- How can you make your design durable, but lightweight?
- Can your device be moved from place to place easily?
- Does your design take into consideration the weight of the different objects your equipment will encounter?
- If you were to help make this design for a real rescue mission, what would be the best materials for your design?



### More on the Chilean Mine:

For the Chilean rescue mission, engineers had to think of lots of different details to ensure the safety of all 33 miners. To test for the best drill, three different companies started drilling down to the miners. This allowed for a variety of potential solutions, and, it was hoped, a faster rescue. NASA helped the Chilean government with designs for the rescue capsule, called the *Phoenix*. Once a secure path was drilled down to reach the trapped miners, and a rescue capsule had been tested, each miner used the rescue capsule to return to the surface one by one. The capsule safely ensured that every miner was brought up at a gradual pace.

#### Resources:

[http://ef.engr.utk.edu/efp/diversity-2011/mites-2011/tti\\_meeting\\_10.pdf](http://ef.engr.utk.edu/efp/diversity-2011/mites-2011/tti_meeting_10.pdf)  
<http://www.charlesapple.com/uploads/2010/10/101019LondonTimesChile01.jpg>

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