

“In Outer Space”

Module 8, Zipline Rockets



Prompt:

Build a rocket to help an astronaut get from the moon back to earth! Be sure to test your designs many times and watch closely for ways to make them better.

Materials:

- [Fishing line](#)
- Tape
- Paper
- Coloring supplies
- [Legos](#) or Duplos

Alternatives INSTEAD of Legos:

- Dixie cups
- Paper clips
- Scrap paper
- Recycled materials (yogurt cups, egg cartons, etc.)

Instructions:

1. Read the prompt with your child.
2. Invite your child to draw a moon and an earth (or find images online).
3. Have them cut out the earth and moon.
4. Refer to the images below in the Resources section for set-up. Attach the moon somewhere high (but that your child can reach) on a wall or a sturdy piece of furniture.
5. Start your zipline at the moon by tying or taping the fishing line on or near the moon.
6. Unspool the fishing line until it reaches the floor or a low piece of sturdy furniture. Cut the fishing line and tape or tie it at this location. This will be the “earth”. Tape the picture of the earth here. Make sure the line is taught.
7. Show your child the materials they have to work with. Demonstrate that their creation will have to ride the zipline from the top (the moon) to the bottom (the earth) and stay together in one piece. Here are a few things for your child to think about while designing...

- How will their design stay on the zipline as it travels?
 - Start with a simple design (using just a few Legos/other materials) and watch what happens. Will it balance when it slides down the zipline?
 - Maybe try by making an “C” shape out of legos and see how that works. Or try an upside-down “V”.
 - Then, try to find a way to better attach it to the zipline to stay on longer.
 - Invite your child to change their designs and help your child make their own predictions about their creations.
8. Give your child lots of time to design and test.
- **Note:** When we do this activity at Boston Children’s Museum, more often than not, kids’ designs break the first (and 10th and 20th and…) times they test them, but they love to keep tinkering and engineering. It is important to prepare your child for the reality that their designs will break over and over. And that’s okay! In fact, it’s part of the fun of this activity. With materials like Legos, designs can easily be put back together or reimagined entirely. The activity emphasizes the process not the product.

Resources:

The images below show a zipline set-up from two different angles.



Extensions:

If your child needs more challenges to go along with this activity:

- Time how long it takes for their rocket to go from the moon back to earth. Challenge them to make the flight longer or shorter by altering their rocket design.
- Swap out your fishing line zipline with another material like yarn, twine, or string. Invite your child to test their rocket out and modify it for the new zipline.
- Change the angle of the zipline to be flatter or steeper. Invite your child to test their rocket out and modify it for the new zipline.

Together with your child, go to the "In Outer Space" topic on Flipgrid and share their Zipline Rocket in action!