

Activity Guide: Zip Lines

Purpose: Design your own Zip-line by using gravity.

Museum Connection: We are curious, creative and playful!

Main Idea: Zip lines work by using gravity as its powering force. By setting up zip-lines at different angles and lengths, they can allow people or supplies to reach a destination by avoiding obstacles that may be laying on the ground.

Background Information for Educator:

- A force on an object can be either a push or a pull.
- Two forces at play on a zip line are gravity and friction
- When two things rub together, it causes friction, which is the force that resists motion. In other words, friction is a force that slows a moving object down. Surfaces that are bumpy or rough will produce more friction than a smooth surface. Friction is often used to slow or control the speed at which an object travels on a zip-line.
- Gravity is a force between two objects that pull them toward one another. Earth's gravity is a force that pulls objects down the ground. The zip line moves down the line in part because of the force of gravity pulling down on the zip line basket (cup).

Sources: unknown

Prep Time: 15 min

Activity Time: 30-60 min

Age: K-8

Materials:

Item	Quantity
Paper and pencil	
4 ft piece of string	
Small plastic animal or toy	
3 foot piece of tape	
Paper clips	
Dixie cups	
Metal washers or small items of identical weight	
Straws (optional)	



Pipe cleaner (optional)	
Scissors	

Talking Points: You can give the kids challenges, if you want to extend the time spent on this activity. Can they build a zipline that takes an object 4 seconds to get from point A to point B? 10 Seconds? Side by side zipline races?

Step-by-Step Instructions:

1. Have a group discussion about what ziplines are and their purpose. (To move objects from point A to point B, across dangerous areas, just for fun!)
2. Tell the students that they will be working in groups of two to design a “vehicle/vessel” to safely move an object safely (does not fall out of the vessel) from point A to point B. Discuss what sort of things might affect the safety of a zipline. How steep is the slope, the speed the object will move from the top of the zipline to the bottom. This is a good place to work in a discussion on friction.
3. Have your student draw their design first. Give 5 minutes for this part)
4. After they’ve drawn their design, give your student a 4 foot piece of string and their object (LEGO person, table tennis ball, etc.)
5. Have the rest of the building materials out on a few tables for the kids to choose what they want to use to create.
6. Give the kids 20-30 minutes to build and test their ziplines.
7. Let the kids present their zipline.
8. Have a discussion to recap what they learned. Questions to ask: *What worked? What didn’t work? What challenged them? What was the hardest part? Easiest?*
9. Introduce different challenges such as travel time, less weight, etc.

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Igniting Inspiration

Picture of Final Project:

