Zip Line

A zip line consists of a pulley suspended on a cable mounted on an incline. It is propelled by gravity to go from the top of an inclined cable to the bottom. Zip lines come in many forms, most often for entertainment or as a means of accessing remote or dangerous areas.

< Your Challenge >

Design and build a carrier for a Ping-Pong ball from the top of a zip line to the bottom as quickly as possible. You will have limited materials & tools (see list below) to build your carrier. Your carrier must be quick and easy to put on and take off the zip line, and your Ping-Pong ball must stay in the carrier for the entire trip from top to bottom. Prizes will be awarded for the fastest zip lines!!

**DESIGN - BUILD - TEST - REDESIGN**

Using the Design Process, it's time to get started. Come up with 3 different carrier designs that you think would work well and sketch them out - use the back of this paper for sketching. Once you think you have a good design developed, use the materials & tools (see list below) to build your Ping-Pong ball carrier. Be sure your carrier is quick and easy to put on and take off the zip line. Once you have your carrier built, test your carrier on the zip line - when you test, your design may not work as planned. Study any problems and then redesign or modify your carrier as needed. Remember the key factors to think about are balance and friction. If your carrier doesn’t balance well, add weight or move weight around, and friction reduces speed, even when you’re dealing with smooth fishing line.

**Building Materials & Tools:**
- 1 small piece of cardstock
- 1 small cup
- 4 flat steel washers (1" dia.)
- 4 paper clips
- 2 wooden skewers
- 2 drinking straws
- 12" of string
- 12" of scotch tape
- Scrap paper
- Scissors
- Single hole punch
- Ruler

**Testing Equipment:**
- Zip Line (made out of fishing line)
- Your Ping-Pong ball carrier
- Ping-Pong ball
- (Golf ball)
- (Stop watch)