Design & Build a Zip Line\*

*Materials Needed*

Floss or string

Straws

Paper clips

Paper cup

Tape

Identify the Problem

Write out a *problem statement* that describes the challenge you need to solve. In this case, we need to design and build something that can carry an object from Point A to Point B as safely and quickly as possible.

Once you’ve identified a problem, find out more about it by doing a little investigation. For example, it would be helpful to know the different parts of a zip line—a tool used to carry objects across distances.

*Zip Line Parts*

The line: spans two points across a distance

The carrier: holds the object as it moves along the line

The connector: connects the carrier to the line

**Brainstorm Solutions**

Take some time to sketch out possible solutions to the problem on a piece of paper. Think through some of the choices you’ve made—how could the shape and materials affect your design?

Select the design you think will work best and start to build!

Create a Solution

Using your materials, start building your zip line according to the plans you brainstormed.

Don’t be afraid to change things up as you build. Sometimes our ideas don’t work out as we imagined them. If you need to replace a material or modify the design, do what works best.

Before you test, set up your testing station.

Test the Solution

When everything is ready, place your carrier at your starting point, let go, and watch your zip line in action!

How did it go? Measure the performance of your zip line by comparing it to your problem statement. Did the zip line carry an object from Point A to Point B safely and quickly?

Did something unexpected happen? Consider making changes to your design so that those problems don’t happen again. For example, if the object falls out of the carrier, you could find a deeper cup or use a different material for the line to slow things down.

Modify the Solution

Change up your design by trying to solve any problems you noticed in your test. If there were no problems, could you still improve your design? Make it simpler? Use fewer materials?

Continue to work on your design until it’s as good as you want it to be.

Celebrate Success

Engineering can be frustrating when things don’t work out, so when things *do* work out: celebrate!

\*This activity was modified from the PBS Design Squad, “Zipline” activity.

<https://pbskids.org/designsquad/build/zip-line/>