

Rapunzel's Rescue Pulley!

Remember reading 'Keep It Simple, Rapunzel!' and learning about simple machines? Today, we're going to focus on one of those machines: the pulley! Just imagine trying to get something up a tall tower - a pulley could really help! Let's build one!

Project: Build a Simple Fixed Pulley

Time: 25-30 minutes

You Will Need:

- An empty thread spool (or a small wheel with a groove)
- String or strong twine (about 2-3 feet long)
- A pencil or small wooden dowel that fits loosely through the spool's hole
- Something stable to suspend the pulley from (like the edge of a sturdy table, a chair back, or a doorknob - ask for help finding a good spot!)
- A small object to lift (like a small toy, a keychain, or a little bag with a few coins)
- Tape (optional, to secure the pencil/dowel)

Let's Build! (Instructions for Charlee):

1. **Prepare the Object:** Tie one end of your string securely around the small object you want to lift. This is your 'load'.
2. **Assemble the Pulley:** Slide the pencil or dowel through the hole in the center of the spool. Make sure the spool can spin freely on the pencil/dowel. The spool is your pulley wheel!
3. **Mount the Pulley:** Find a place to set up your pulley. You need to position the pencil/dowel so that the spool hangs downwards and can spin. You could:
 - Rest the ends of the pencil/dowel across the backs of two chairs placed close together.
 - Tape the ends of the pencil/dowel securely to the edge of a sturdy table so the spool hangs off the edge.
 - Have someone hold the ends of the pencil/dowel firmly.Make sure your setup is stable!
4. **Thread the Pulley:** Drape the *other* end of the string (the one NOT tied to the object) over the top of the spool, letting it sit in the groove.
5. **Test Your Machine!:** Gently pull DOWN on the free end of the string. What happens to your object? It should lift UP!

Think About It:

- Was it easier to lift the object by pulling down on the string compared to lifting it straight up with your hand?
- How did the pulley change the direction you needed to pull? (You pulled down, the object went up!)
- How could Rapunzel or the Prince have used a pulley like this at the tower?

Great job, engineer! You've built a simple machine just like the ones discussed in the book!