

**Lesson 15 Build a structure to support a pulley (If Lesson 14 was done. Otherwise, use Lesson 16 that follows)**

**Objectives:** Students experiment with ways to make their PVC pipe structures strong.

**Materials:** Same materials as previous lesson, plus, per group:

- ∞ Pulley and string
- ∞ Plastic grocery bag with 4 – 500 gram weights

Handout with directions for making simple and secure knots.

**Sponge:** Begin journal entry.

**Initial**

**Discussion:** Talk about pulleys used in potato chip factory unit and the need for a structure to hold the pulley.

Safety issue – be sure that the structure is sturdy while building it and while pulling up the weight using the pulley. Watch out for getting conked on the head if the structure comes apart.



**Project:** Build a structure about a meter high that can support a pulley while pulling up 2000 grams. Start by pulling 500 grams, and add to the weight in the bag. If the structure seems unstable, redesign and rebuild.

Students should draw a diagram of their sturdiest structure (or the structure of another group, if they like that structure better) because they will need to make a similar structure next class.

#### Final

Discussion: Students show their projects to the class. Discuss which structures are most stable when pulling up weight.

Next project, students will use a motor to make an elevator. Students should think about how to build an elevator.

Clean up: If possible, keep student structures for next time. Otherwise, take all connectors off PVC pipe.

#### Home

Connection: Talk with family members about how an elevator might work and how to build an elevator using PVC pipe, a pulley, and a motor.