



## UNDER SIEGE!

*The trebuchet is a powerful Class 1 Lever and was a siege weapon used in medieval times. It was a large, bulky contraption, but very effective in hurling rocks at castle walls. The counterbalance weight close to the fulcrum on the main arm could be many tonnes. The movement of the counterweight would cause a long, fast movement in the longer end of the lever. The sling shot on the long end helped to increase the hurling speed of the rock. Sometimes even dead animals would be shot over the castle walls to spread disease.*

**Before trying this challenge at home, try the Medieval Levers activity with Tommy and Marie at [Wonderville.ca](http://Wonderville.ca).**

The trebuchet is a Class 1 Lever which means that the *fulcrum* or pivot point is between the *load* (the missile or item being hurled) and the *effort* (the counterweight). When effort is applied (adding counterweights), the lever pivots around the fulcrum and launches the load.

### The Challenge

Design and build a working model of a grape-throwing trebuchet.

### Materials

- plastic drinking straws
- large and small paper clips
- short lengths of strong wire
- masking tape
- string
- small, heavy objects for counterweights (small rocks, coins, bolts)
- washers
- grapes
- craft sticks
- strips of cloth

### Specifications

- Use the plastic straws to build the structure. To connect the straws, pinch the end of one and slide it into another. Tape the joint together. Use a straightened paper clip for the axle connecting the lever to the frame.
- Build two triangular sections for the frame and attach them to the base. You will need to support or brace the frame to keep it upright.
- The axle should pierce the lever so there is a short arm to which is attached the counterweight. The long arm should be able to swing freely without touching the frame or the ground.
- Construct a sling to hold the grape in the upswing and release it when it reaches the top of the swing.
- Test and modify your trebuchet to hurl the grape the farthest distance. Challenge your family and friends to a grape hurling contest!

