

## Stomp Rocket

**Lesson Overview:** Students will create a paper stomp rocket that carries a specified payload to a specified target.

**Suggested Time:** 60-120 minutes

**Design Criteria:** The rocket will reach the target destination, carrying the specified payload (each group had a different, randomly assigned payload and target)

### Learning Objectives:

- To build collective knowledge of rocket design
- To gain experience evaluating tests results to make design changes

### Materials:

- Paper
- Foam sheets
- Transparencies
- Card stock
- Tape – ideally different types
- Paper clips
- Small paper cups
- Cone-shaped small paper cups
- Weight – washers or coins work well
- (Optional: a wooden dowel the same diameter of the launcher, to help students roll their paper into the correct sized tube)

For the testing station:

- Inexpensive commercially available plastic rocket launchers
- Printed targets (planets, moons, space station, etc.)

### Directions:

- Set up the launcher on one end of a room and tape the printed targets to the floor in a line going away from the launcher.
- Give each student group a mission to carry a certain amount of weight to a certain target. To avoid competition, it can be helpful to give each group a different mission, with more weight for the closer targets..
- Show students how the launcher works: a rocket will slide on top of the plastic tube, then someone stomps or jumps on the soft plastic balloon part to launch the rocket.
- You may want to show students images of different kinds of real rockets, so they do not fixate on the most common ‘cartoon’ image of a rocket.
- Have small groups begin working and testing their designs. Most designs have a body made of paper, foam sheet, or transparency rolled up and secured, with a cup secured on the top. If students have trouble rolling their rockets to the right size for the launcher, provide them with dowels the same diameter as the launcher for them to use while building.

**Possible Discussion Topics:**

- Students can share advice about different problems they've faced, such as the rocket tops flying off during testing, weight falling off, or rockets staying stuck on the launcher.
- As the designs in this task are usually very similar, it provides a great sensemaking opportunity across designs. Students can look across designs and think about what factors matter the most in how far a rocket travels and how much weight it can hold. Students often think first about how heavy a design is, but later come to notice that the shape, materials, weight distribution, and cup type all matter as well.

