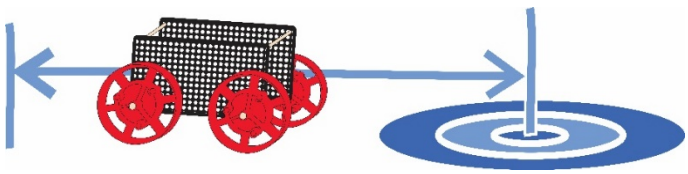
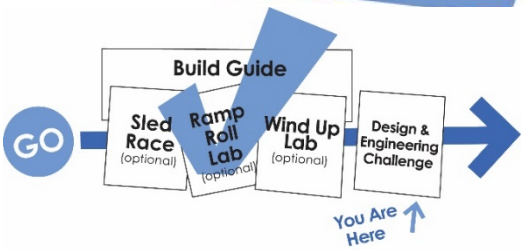
RUBBER BAND RACER TARGET CHALLENGE

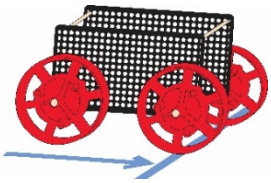




Before you start... Make sure you have built a **Rubber Band Racer** for use on this challenge.
Documents & supplies at teachergeek.com/learn

The Challenge

Redesign your rubber band racer to roll to and stop at a target.
The target may move, so your racer should be able to adjust.



Constraints

(things your design can not, or must, do or be)

Power:

- Racer power may only come from up to 5 of the provided #16 rubber bands.
- Tire Rubber bands may not be used to power the racer.

Allowable Materials:

- TeacherGeek components
- Recycled food packaging
- Other available materials (wood, plastic, etc.)

Geometry:

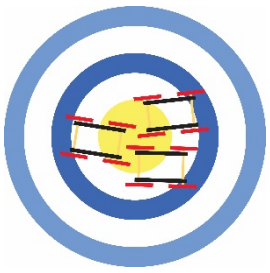
- At the start of the competition, vehicles must fit within a 50cm x 50cm x 50cm area

Function:

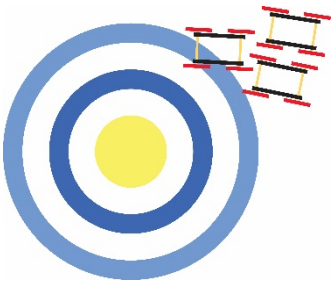
- Racer wheels must begin behind starting line
- Measure the distance racer travels to its front wheels
- Racer must travel on at least three TeacherGeek wheels

Precision & Accuracy

Your racer should have **precision** and **accuracy**.



Accuracy is how close you get to the actual (true) target or goal, such as the center of a target.



Precision is how consistent (repeatable) your results are.

RUBBER BAND RACER TARGET CHALLENGE

Getting Started

Supplies:

- Tape Measure
- Rubber Band Racer
- Extra TeacherGeek components, other/recycled materials

Setup:

- Find a flat, long area of floor
- Mark the starting line with a strip of tape

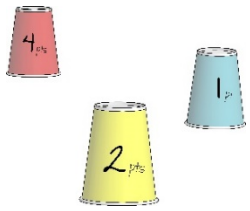
Ways to Play

Hit the Target:

Design a racer to stop as close to a target as you can. The target can be a tape line, or circle drawn on paper and any distance away from start. Change how the racer's rubber bands wind up, or add mechanisms to get it to stop at the target. Record and graph the data for every attempt. *Scoring:* Roll your racer three or more times, measuring its distance each time. Add the distance measured (from the target) from three attempts. This is your score. The racer/team with the lowest score wins.

Bowling for Points:

Targets are placed at various positions and distances on the track. Points are scored when racers hit a target. The racer with the most sum points of targets hit after a certain amount of time, wins.

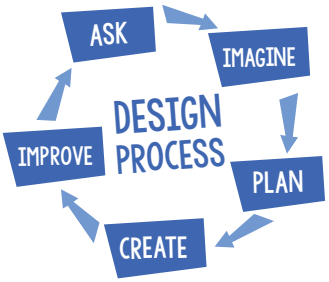


Edge Racing:

Get your racer as close to the edge as you can, but don't go over it. The edge can be represented by a strip of tape on the track. It can be placed at any distance, and can be moved between rounds. *Scoring:* Place a piece of tape where your racer rolls to, only if it is before the "edge". If it is after the edge, it "fell off" so no tape can be placed. Do this each time your racer rolls. The racer/team with the tape closest to the line wins.

Design Process

You will be using the Engineering Design Process. What does that mean?
Your design is never finished (it can always be improved).
There is no such thing as a perfect design.



Mars Rescue Mission

Mission Brief

The first humans on Mars will travel over 9 months to reach the red planet. That's just the easy part.

Landing Notes

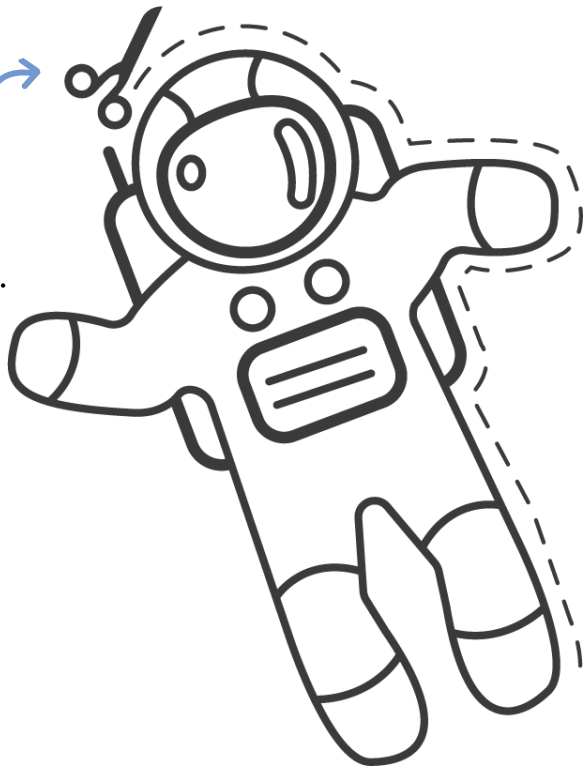
Your racer (and its cargo) must land safely and accurately on the target in seven minutes or less.

For a more in-depth **Mars Rescue Mission**, download the free, immersive powerpoint *Presentations at teachergeek.com/learn*

Uses an **aeroshell** & parachute to safely land.

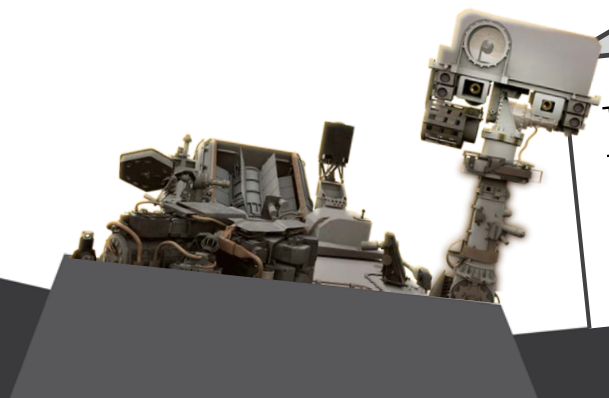
Use **rubber ducks**, the astronaut template below or other materials to represent human cargo.

Cut me out, and tape to **popsicle sticks**, pencils or other objects to add more **mass**.



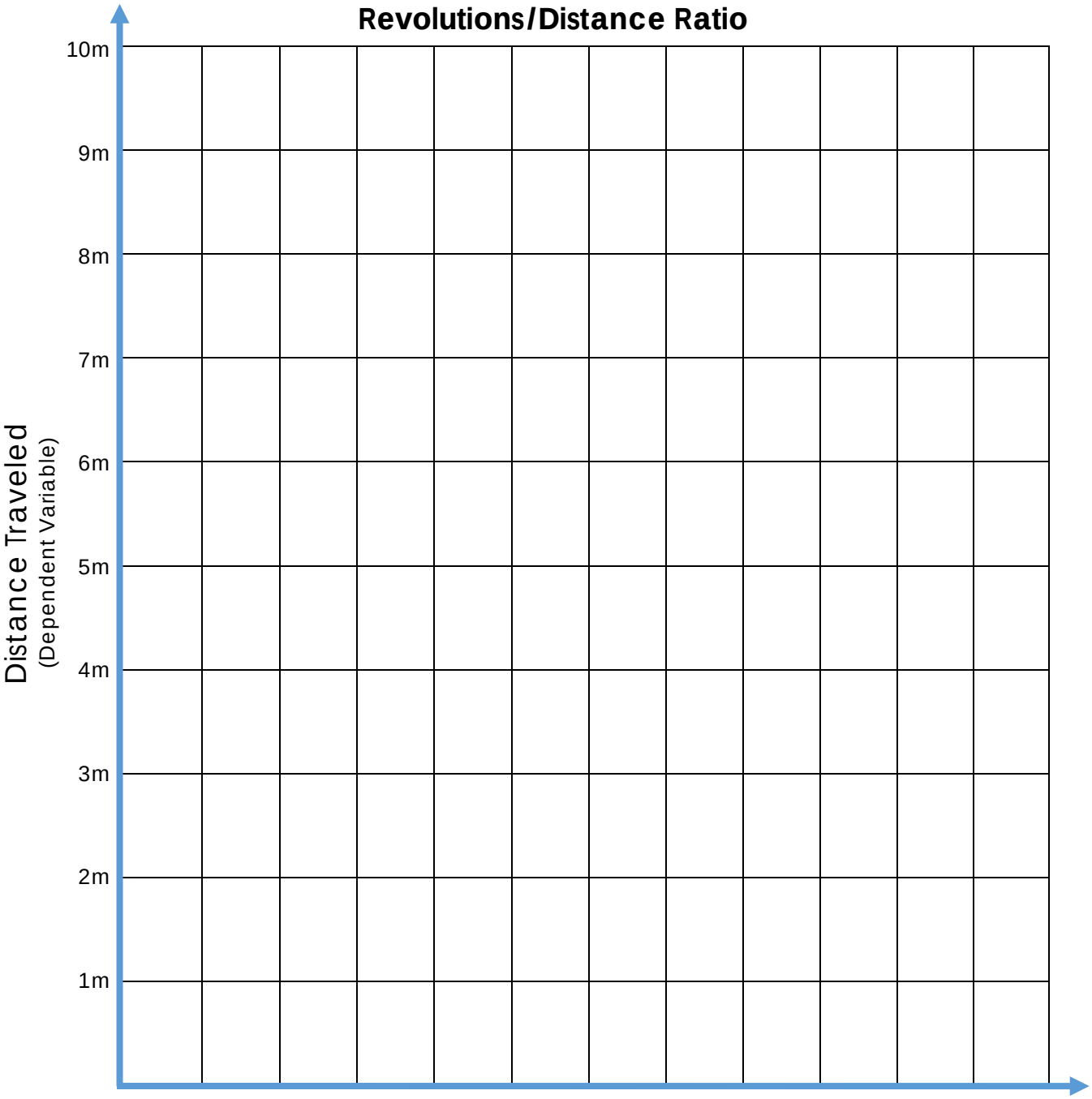
A time limit raises the landing stakes.

The **Mars Curiosity Rover** had only **7 minutes** to reach the planet's surface from when it entered the atmosphere. NASA engineers had to execute each step perfectly or lose the rover. *How accurate can you be in seven minutes?*



Name: _____ Set: _____

Revolutions/Distance Ratio



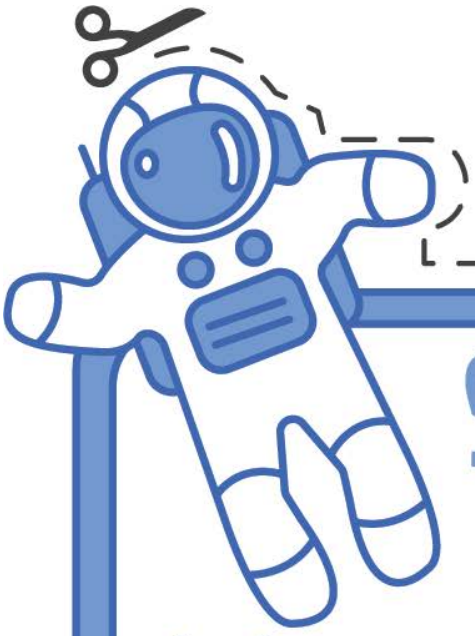
Revolutions to Wind Wheel/Rubber Bands
(Independent Variable)

RUBBER BAND RACER TARGET CHALLENGE

TeacherGeek

Name: _____ Set: _____

Design/Group	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6	Trial #7	Trial #8	Trial #9	Total or Average



TeacherGeek

TEACHERGEEK.COM/LEARN

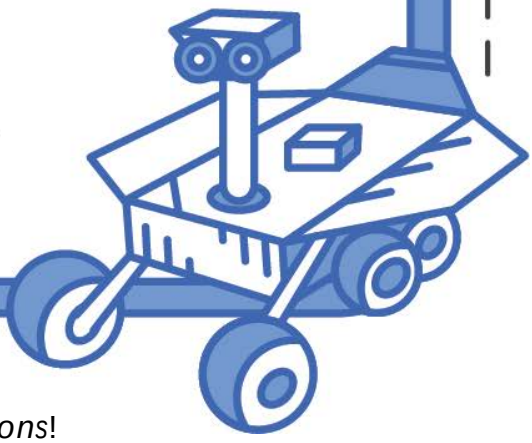
Mars Rescue Mission

Certificate of Completion

is awarded to

Your Name Here

for the succesful and creative
completion of the TeacherGeek
Mars' Engineering Challenges



Receive this award after successfully finishing all three **Mars Rescue Missions** – *congratulations*! You are now a true Mars Engineer Emeritus.