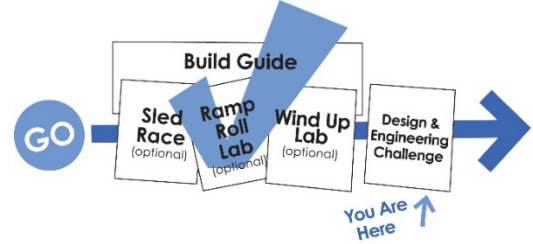
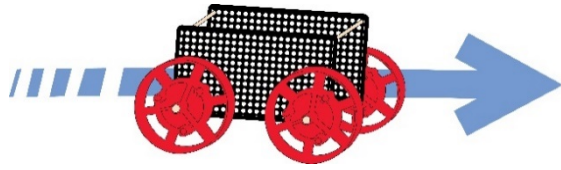


RUBBER BAND RACER SPRINT CHALLENGE



Before you start... Make sure you have built a **Rubber Band Racer** for use on this challenge.

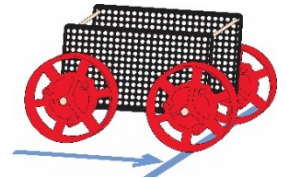
Documents & Supplies at teachergeek.com/learn

The Challenge

Redesign your racer to break a speed record, or win a race.

Constraints

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



Power:

- Racer power may come from **up to five** of the provided #16 Rubber Bands.
- Tire Rubber Bands **may not** be used to power the racer.



Geometry:

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

Function:

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

Allowable Materials:

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

Getting Started

Supplies:

- Rubber band racer,
- Extra TeacherGeek components
- Other/recycled materials
- Stopwatch

Setup:

- Find a flat area of floor, 4 meters (13ft) or longer
- Use tape to mark the starting and finishing line, 3 meters (9ft) apart

RUBBER BAND RACER SPRINT CHALLENGE



Ways to Play

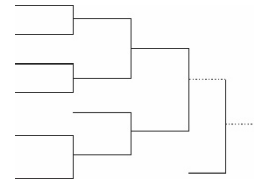
Speed Challenge:

How fast can your racer make it down the track? Redesign it to go as fast as possible down the 3-meter track. Use a stopwatch to time your racer. Compete against yourself, or other racers for the fastest time.

Duo Challenge:

Go head-to-head with other racers. See who can cross the finish line first. Place two or more racers behind the starting line. On "go", release the racers and watch them zoom. The first one to cross the finish line wins.

For a competition with more than two racers, try using an "elimination bracket". They can be found on the Internet.



Heavyweight Challenge:

How much can your racer carry, and how fast can it carry it? Redesign your racer to carry a book, or books, down the track. **Newton's Second Law** states $F = M \times A$ (**force** equals **mass** times **acceleration**). Examine how changing the mass of your racer affects its acceleration (how your racer gains speed), or the force needed to move it. Your racer will probably have to change how it releases energy to carry more books.



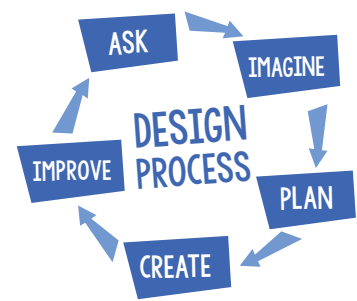
All Terrain Challenge:

Set sticks, or other materials, across the track.

Redesign your racer to get over them and down the track, as fast as possible.

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

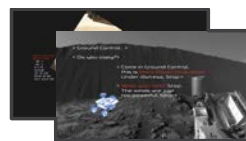


Mission Brief

Escape the incoming Martian **Dust Storm** and return to base safely in one piece.

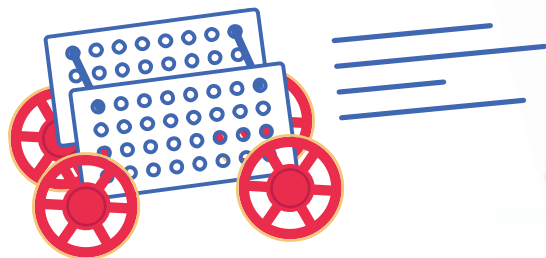
Outpace Storms?

Dust storms are no joke - damage to your rover could lose years of research. Escape as fast as you can.



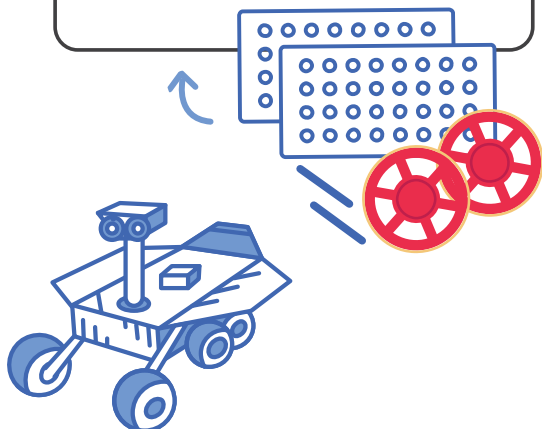
For a more in-depth **Mars Rescue Mission**, download the free, immersive powerpoint

Presentations at teachergeek.com/Learn

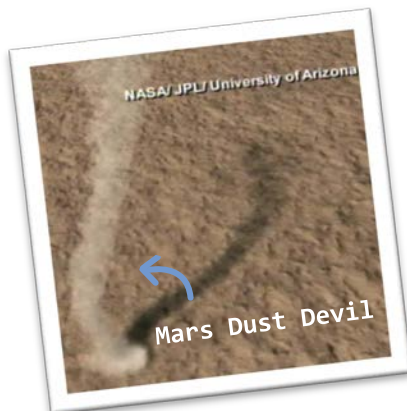


The fastest Mars Racer escapes the storm intact.

The rest of the racers must **lose one component** as damage from dust. Then, race again!



The **climate** on Mars is unpredictable - ice clouds and dust storms can put your Mars Rover in **danger**.



Need wind?

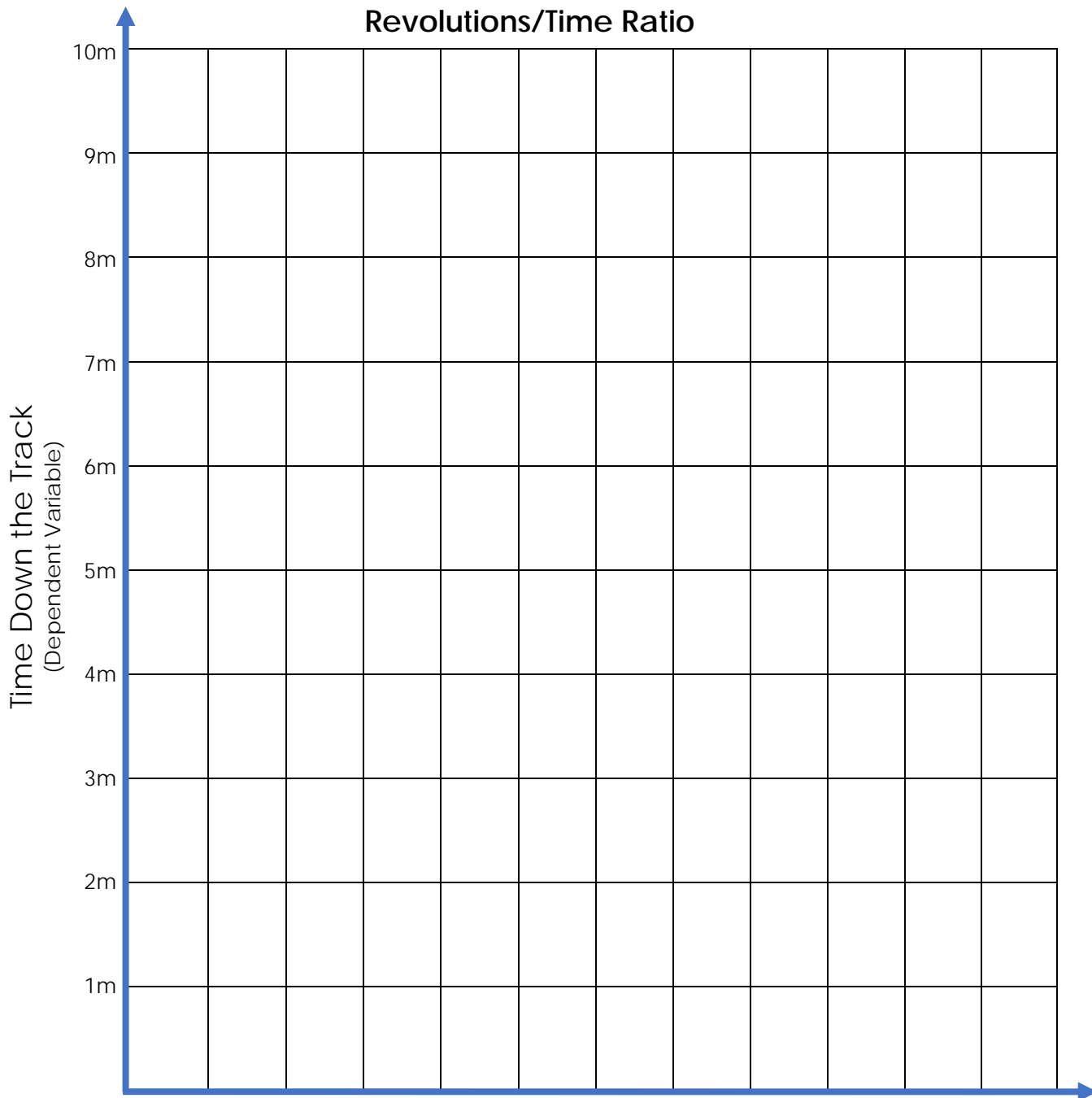
Use a fan to create a gusty storm for your racers.



RUBBER BAND RACER SPRINT CHALLENGE



Name: _____ Set: _____



Revolutions to Wind Wheel/Rubber Bands
(Independent Variable)



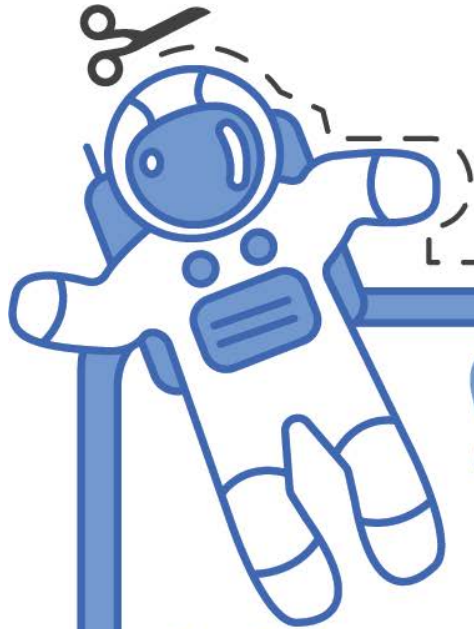
RUBBER BAND RACER SPRINT CHALLENGE



Name: _____ Set: _____

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

RUBBER BAND RACER SPRINT CHALLENGE



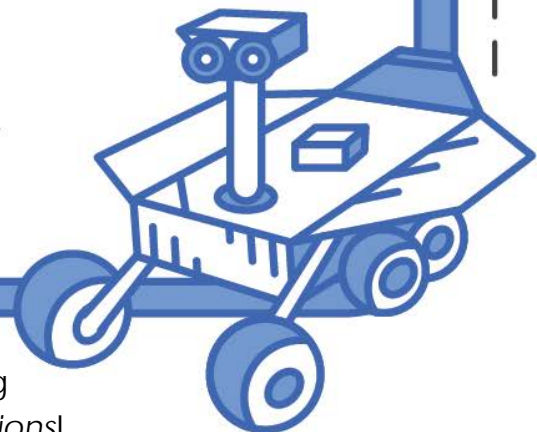
Mars Rescue Mission Certificate of Completion

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.