

WHAT ARE WE INVESTIGATING?

Can you make a ramp for your car or ball to go down? How fast can your car go down the ramp?

MATERIALS:

- Cardboard
- Paper
- Tape
- Straws
- Pipe Cleaners
- Car or Ball (something to go down the ramp) (Matchbox Car, Ping Pong Ball, etc.)
- Strive Academy's Engineering Design Process Handout (found at www.striveacademy.org)
- Pencil or Pen
- timer

EXTENSION:

- * Build your ramp again with different materials.
- * Try to add something new to your ramp - maybe a hill or a loop. See if it works with your new addition!
- * Check out this video about the energy in a roller coaster!
<https://www.youtube.com/watch?v=-dpBVtAbKJU>

DIRECTIONS:

1. Choose the materials that you want to use to build your structure. Our materials are just suggestions - feel free to add other things too!
2. On your handout (found at www.striveacademy.org), fill in the title of your experiment (Ramp It Up).
3. On your handout, fill in your hypothesis. You want to answer the question: How fast do you think a car or ball can go down your ramp?
4. On your handout, draw a picture to design your ramp. Sketch out what you want your ramp to look like. Feel free to use crayons/markers to add some color to your picture!
5. Build your ramp using your materials. You may want to do this on the floor to have more room. Decide if you want your ramp to be free-standing or be held up with a chair or something else.
6. Once your ramp is complete, on your handout under "Data Collection/Observations", draw a picture of what your finished ramp looks like.
7. Put the car/ball at the starting point on your ramp and let it run down your ramp.
8. Once you have practiced a few times, use your timer to measure how long it takes to get from the starting point to the bottom of your ramp. Under "Results", record your time.
9. Repeat Step 8 three more times.
10. Answer the "analysis" questions on your handout:
 - Find the average time it took to get your car/ball down the ramp. Add up all 4 of your time trials. Then divide that number by 4. Record this under "results".
 - Was your hypothesis correct? Was your average time faster or slower than your hypothesis?
 - At the top of your ramp, your car/ball has potential energy when it is not moving.. When it is moving down the ramp it has kinetic energy. Where do you think it has the most kinetic energy on your ramp?

**** Try the extension activities on the first page for more fun! ****