



# Build a Paper Rollercoaster at Home

## Materials

- Paper (preferably cardstock but any will do)
- Scissors
- Ruler
- Tape
- Marble

## Safety

- Age should be considered when completing this project. Adults should handle any sharp tools.
- Please use a surface that can withstand scratches if using a straight edge tool.

## Learning Outcomes

- Explain how potential energy is being converted into kinetic energy through the force of gravity acting on the marble as it moved through the track.
- Identify points in the rollercoaster's track in which the marble is at maximum kinetic energy and maximum potential energy.
- Explain how changing different variables (either the weight of the marble or the path of the track) will affect the time it takes for the marble to travel from Point A to Point B.
- Identify other aspects of the rollercoaster design that can be modified to fit the student-engineer's vision (ex. Material, track length, curves, loops, etc.)

## Steps

Disclaimer: These "steps" are for a more guided approach to building a paper rollercoaster. Student-engineers are encouraged to get creative with their design and modify the pieces as they see fit!

1. Gather and organize your materials.
2. Print the templates for the desired pieces. It is preferred to use cardstock but regular printer paper will work just fine.
3. Using the lines shown on the templates, fold and cut accordingly. Dotted lines are to be folded and solid lines are to be cut.
4. Supports: First, assemble the supports for the start of the rollercoaster and place wherever the rollercoaster should start. Secure the supports to your work surface using tape.

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5. Support Triangles: If planning to use support triangles throughout the rollercoaster, cut and assemble as many as you would like. These can be used to secure the track at different heights throughout.
6. Tracks: Using assembled tracks (either straight or curved), plan the path that you would like your rollercoaster to take and use supports and tape to secure the flexible pieces and create your design.
7. Funnel: For a little more controlled chaos, add one or more funnels throughout to shift the path of the marble. This could even be a fun way to end the rollercoaster!

