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# MAR10 Day

## Summary

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### KEY CONCEPTS

Physics, kinetic energy, potential energy, gravity

### CREDITS

Svenja Lohner, PhD, Science Buddies

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## Introduction

In this activity, you will use recyclable materials to make your own wall marble run. A marble run is a fun toy and a great way to learn about physics concepts like kinetic and potential energy. Do you think your marble will make it to the end of the track?

## Materials


- Cardboard tubes
- Painter's tape or masking tape
- Scissors
- Marbles
- Paper
- Pencil
- Optional: markers, stickers or colored tape and paper for decoration.

## Prep Work

1. Find an empty section of wall that you can use to build your marble run.
2. Explore your materials.



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 *How many cardboard tubes do you have? How big of a marble run do you think you can build? What can you use to catch your marble at the end?*

## Instructions


1. Think about a design for your marble run before you start building. For example, will it zig-zag back and forth? Do you want to include any flat or even uphill sections? Also think about whether you want to use the whole tubes or cut them in half. Make sure your marble run starts high above the ground.

 *Why do you think it is important to start the marble run high above the ground?*


2. If you like, you can decorate the cardboard tubes with stickers, wrapping paper, or markers.
3. Start building your track. Using your cardboard tubes, assemble your track according to your plan. Tape the first cardboard tube to the wall with a long strip of tape. Place your second tube next to the first one, and so on. Don't build your whole track all the way down to the floor yet. Build a small segment and then stop to test it.

 *What do you have to think about when connecting the tubes?*

4. Test your marble run. Place the marble at the top of the track and let it go. Watch carefully.

 *What happens? Does it make it the whole way to the end of the track?*


5. If your marble didn't make it to the end, try figure out why. Is there a spot in your track where the marble got stuck? Was the marble going too slow to make it over a hill? If necessary, make changes to your design, like adjusting the angles of your tubes or improving the tube connections and try again.

 *Can you figure out why the marble didn't make it to the end? What do you have to do to fix your problem?*


6. If the marble made it the whole way to the end, try to add more track segments to your track, or build alternative routes by connecting more cardboard tubes.



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 *When putting together your track, how do you think the angles between the different cardboard tubes matter?*

7. Keep refining your track until you are happy with your final design. Do not forget to test your track often by running a marble through it. Every time the marble runs down the track, observe it closely.

 *What do you observe when the marble goes from one tube to another, switches direction, or runs through flat and uphill segments in your track?*