MAKE YOUR OWN MARBLE RUN

DID YOU KNOW...

Marble runs work in much the same way as roller coasters do - but on a much smaller and simpler scale. How do you think the carriages on roller coasters are powered? Engines? Magnets?
The answer is GRAVITY, and we're going to apply a few simple rules of physics (and a lot of creativity) to build our own recycled marble runs.

YOUR CHALLENGE!

Using materials that you probably already have at home, can you make chutes, ramps, tunnels and funnels to take your marble on a creative 'assault course'?

YOU WILL NEED:

- A large cardboard box
- More sturdy cardboard from boxes
- Cardboard tubes - from kitchen/toilet roll, or the inside of clingfilm rolls
- Scissors
- Tape
- Marbles
- A timer

SUGGESTED EXTRAS:

- Rolled up newspaper/magazines
- An egg carton/cup
- The top of a plastic bottle - these make great funnels!

WHAT TO DO:

1. Cut the lid and front off the cardboard box, so you can reach inside.
2. Use the cardboard and rolled up paper to make chutes, ramps and tunnels.
3. Make holes in the tubes so the marble can fall from one into another.
4. Position the chutes at an angle inside the box and fix into place with tape.
5. Place chutes back and forth until you reach the bottom - how long does your marble run last?
6. If you have time, decorate and add start and finish signs.

This one lasts around 10 seconds

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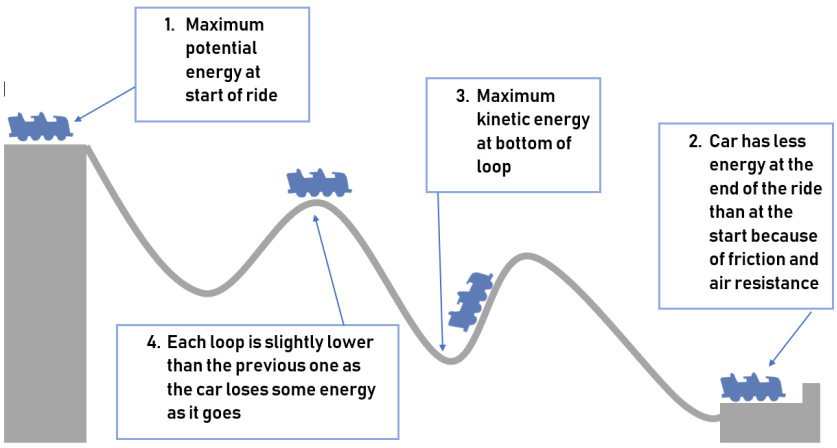
AND NOW FOR THE SCIENCE...

We need a force to act on the marble to get it to move, in this case that force is gravity.
The top of your marble run is where you have most potential energy - stored up energy that we can put to work.
When you let the marble go, that potential energy is converted into kinetic energy - moving energy.
The marble reaches the bottom because objects that are moving then stay in motion unless another force stops them - this is one of Newton's three laws of motion. Do you know the others?

How does changing the starting height of your marble run affect the time of the run?

Why does the marble roll faster down longer, steeper slopes?

What happens to the time of your run if you use a bigger, heavier marble?



EXPLORE FURTHER

For more resources and videos search for the following:

- Siemens: Formula for Thrills
- Ted-Ed: How Roller Coasters Affect Your Body

IN THE REAL WORLD:

Motor drives help pull the roller coaster cars to the top of the first drop, and from there it is gravity that powers the carriage along the track!

COMPETITION TIME!

- Complete 4 challenges and submit an entry to our poster competition to be in with a chance of winning an EDT Experience Day at your school.
- For funded schools, you have the opportunity to receive the Industrial Cadets Challenger Award - click here for full details.
- Share a photo or video of your experiment with us on social media and use the hashtag #STEAMstars