

The Smallpeice Trust
**ENGINEERING
@HOME**

04

The Marble Run Challenge

#EngineeringAtHome

Suitable
for ages:

5+

Time
needed:

1hr+



smallpeice 
Dare to imagine

Curriculum links: Maths – shapes, measurement; Science – gravity, materials; D&T – design, make, evaluate

Skills learnt: Design, building, testing, evaluation



Since our Smallpeice team can't visit schools, we've decided to challenge each other to make a marble run which you can test at home.

04

Learning Objectives

Create purposeful, functional and appealing designs

Select from a wide range of materials and use tools to perform practical tasks

Build structures, exploring how they can be made stronger and more stable

Evaluate your ideas and products against design criteria

Topics Covered

GRAVITY

<https://bit.ly/2VAzcJv>

TRANSFER OF GRAVITATIONAL POTENTIAL ENERGY TO KINETIC ENERGY

<https://bit.ly/2XlqNpX>

NEWTON'S LAWS OF MOTION

<https://bit.ly/2VFhncC>

WHAT MATERIALS TO USE

You can use cardboard, plastic, wood, or anything else that works well and you can get at home.

Try looking in your recycling box.

HERE'S WHAT WE USED:

1. CARDBOARD
2. SELLOTAPE
3. SCISSORS
4. EGG CARTON
5. PAPER
6. MARBLE (or make your own)
7. CARDBOARD TUBES
8. FELT TIPS - to decorate



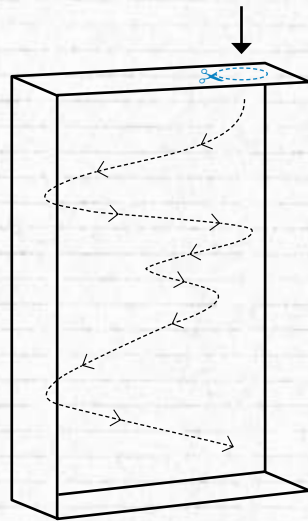
INSTRUCTIONS



1.

Find something to act as a backboard for your marble run – this can be as big or small as you would like.

Some good ideas are a cereal box or a shoe box lid, but any piece of cardboard will do.



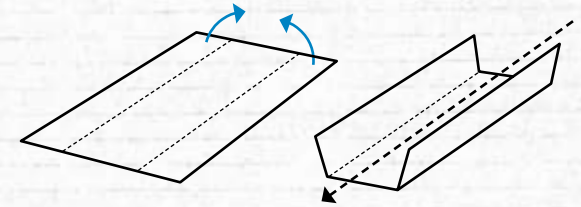
2.

If needed, **cut an entrance** for your marble to enter at the top.

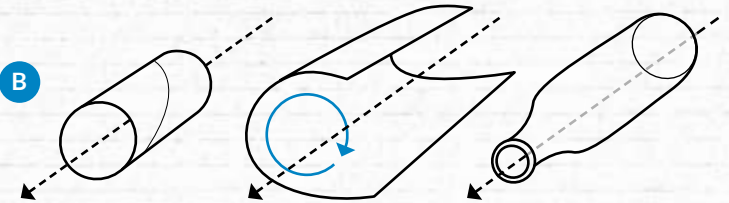
Now design the route your marble will take.

You could trace out where you want your marble to go or freehand it.

A



B

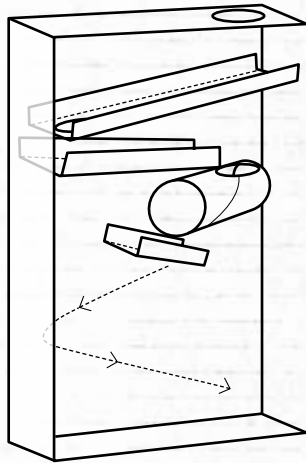


3.

There are many ways for your marble to make it to the bottom:

- A To make “steps”, cut out a strip of cardboard, make sure it is wide enough to fold two tabs and for the marble to fit on. Fold the strip on both edges – one to stick to your backboard and use the other to keep the marble on course.
- B You could also use toilet roll tubes or roll paper tubes to make tunnels, or plastic bottles to act as a funnel. Just make sure your marble fits through these.

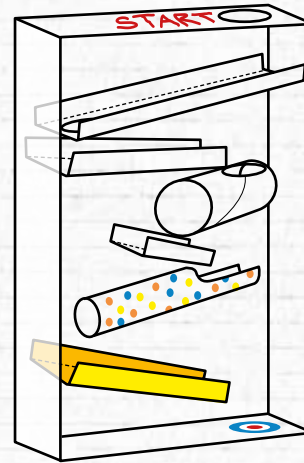
INSTRUCTIONS



4.

Stick your steps to your backboard.
The most important thing to remember is that they must be on an angle so that gravity can work on your marble.

Make sure to test that your marble follows the path as you are building.



5.

Decorate your design with felt tips or coloured card to make it stand out.



6.

Time to test your completed marble run!

NEED A CHALLENGE?

If you complete your marble run and want to challenge yourself further:

1. Think about some real-life examples of how this science is used and create a design that mimics them. For example, you could make a rollercoaster or waterslide version
2. Make another marble run and race your marbles to see which one is quickest
3. Make two routes on the same backboard and time them or race them
4. Create alternative routes by having a tab you can change to direct the marble a different way, like a train track
5. Make a supersized one by joining multiple boxes together
6. Decorate your marble run to make it stand out
7. Film a video and send it to us!

Once you've got your marble run performing at its optimum, film it in action and share your video on:



www.facebook.com/TheSmallpeiceTrust




www.twitter.com/SmallpeiceTrust
Use the hashtag **#EngineeringAtHome**



www.instagram.com/TheSmallpeiceTrust

STEM Day Risk Assessment

Risk Assessment for	Engineering at Home Projects
Assessment undertaken on	31/03/2020
Assessment undertaken by	Jessica Lee
Signed	

No.	Activity/area being assessed	Associated risk	Who is at risk?	Existing control measures in place?	Level of risk (low, medium, high)	Responsibility
1	General Activity and Workspace	Slips, trips and falls: Injury due to tripping over items	Students and adults	Activity supervised by adult supervisor. Deliverer reminds students about safety in video introduction.	M	Students and adults
2	Use of Materials: paper/card, plastic containers	Injuries: Injury due to paper cuts, cuts from sharp edges Injuries: Injury due to misuse	Students and adults	Activity supervised by adult supervisor.	L	Students and adults
3	Use of materials: elastic bands, sellotape, glue stick, blu-tack, small toys, paper fasteners, LEGO pieces, nuts & bolts or equivalent.	Injuries: Injury due to use as a missile Slips, trips and falls: Injury due to slipping on dropped items Injuries: Ingestion risk of choking.	Students and adults Students and adults Students and adults	Activity supervised by adult supervisor. Activity supervised by adult supervisor. Activity supervised by adult supervisor.	L	Students and adults
4	Use of materials: plastic, corrugated cardboard	Injuries: Cuts from sharp edges	Students and adults	Activity supervised by adult supervisor.	L	Students and adults

No.	Activity/area being assessed	Associated risk	Who is at risk?	Existing control measures in place?	Level of risk (low, medium, high)	Responsibility
5	Use of sharp tools: Scissors, craft knives	Injuries: Cut to self	Students	Activity supervised by adult supervisor.	M	Students and adults
		Behaviour: Cut to others	Students and adults	Activity supervised by adult supervisor.	L	Students and adults
		Behaviour: Vandalism of property	School or home	Activity supervised by adult supervisor.	L	Students and adults
6	Testing of projects: bathtub, drop from height, items on floor	Spillage of water on floor: damage and injury due to slip	Students and adults	Activity supervised by adult supervisor.	L	Students and adults
		Slip, trip or fall: Injury due to falling from testing area, tripping over items in testing space	Students and adults	Activity supervised by adult supervisor.	L	Students and adults