

The Smallpeice Trust  
**ENGINEERING  
@HOME**

06

The Rocket  
Launcher  
Challenge

#EngineeringAtHome

Suitable  
for ages:

5+

Time  
needed:

1hr+



smallpeice

Dare to imagine

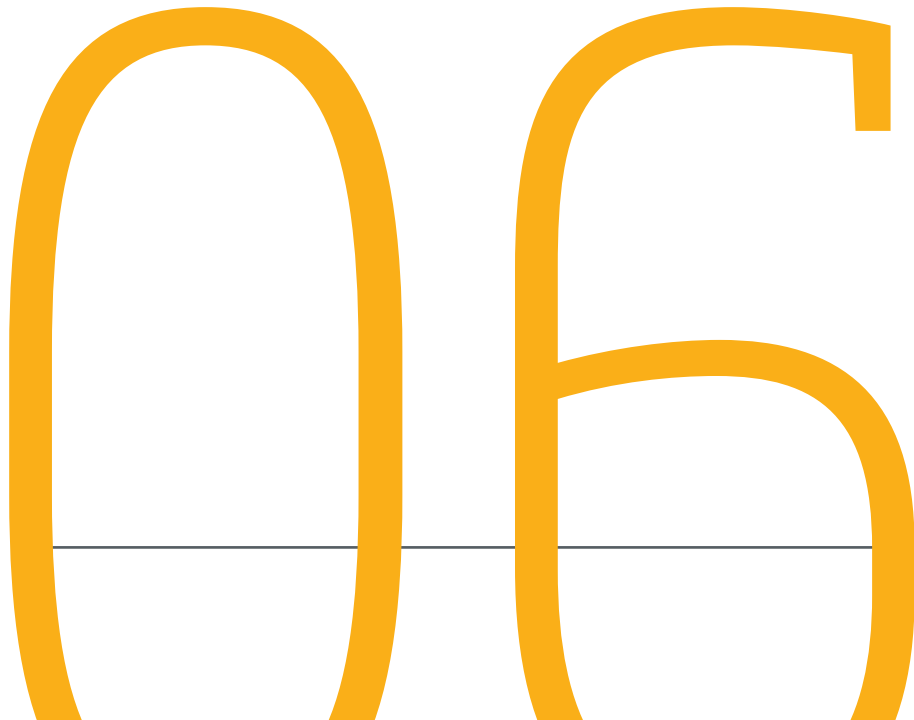


Curriculum links: Maths – shapes, measurement; Science – aerodynamics, materials; D&T – design, make, evaluate

Skills learnt: Design, building, testing, evaluation



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



## 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

**AERODYNAMICS**

<https://bit.ly/2SwQ979>

**SPACE EXPLORATION**

<https://bit.ly/2SgvST2>

**HOW REAL ROCKETS WORK**

<https://bit.ly/3eZo2Xw>

## **WHAT MATERIALS TO USE**

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

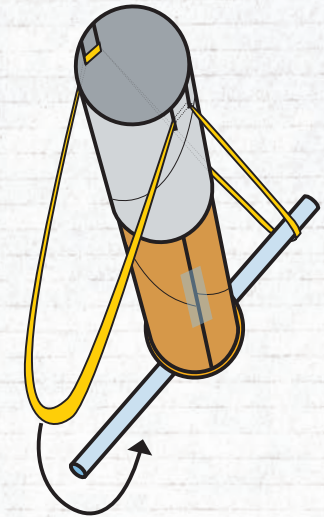
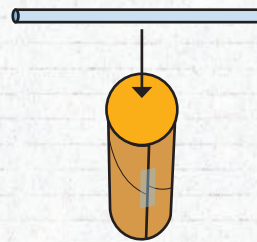
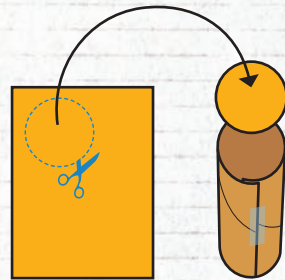
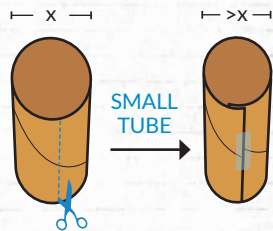
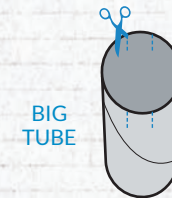
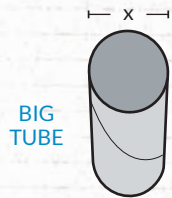
Try looking in your recycling box.

### **HERE'S WHAT WE USED:**

1. **2 CARDBOARD TUBES**
2. **CARD/CARDBOARD**
3. **STRAW**
4. **ELASTIC BAND**
5. **PAPER**
6. **SCISSORS**
7. **TAPE**



## INSTRUCTIONS TO MAKE THE LAUNCHER



1.

You will need one of your tubes to be smaller than the other to fit inside the first one.

If they are the same size cut one and stick it back with an overlap.

2.

Now block the end of the smaller tube.

Draw round the end onto a cardboard sheet and stick it into the end.

3.

Then stick the straw to the blocked bottom.

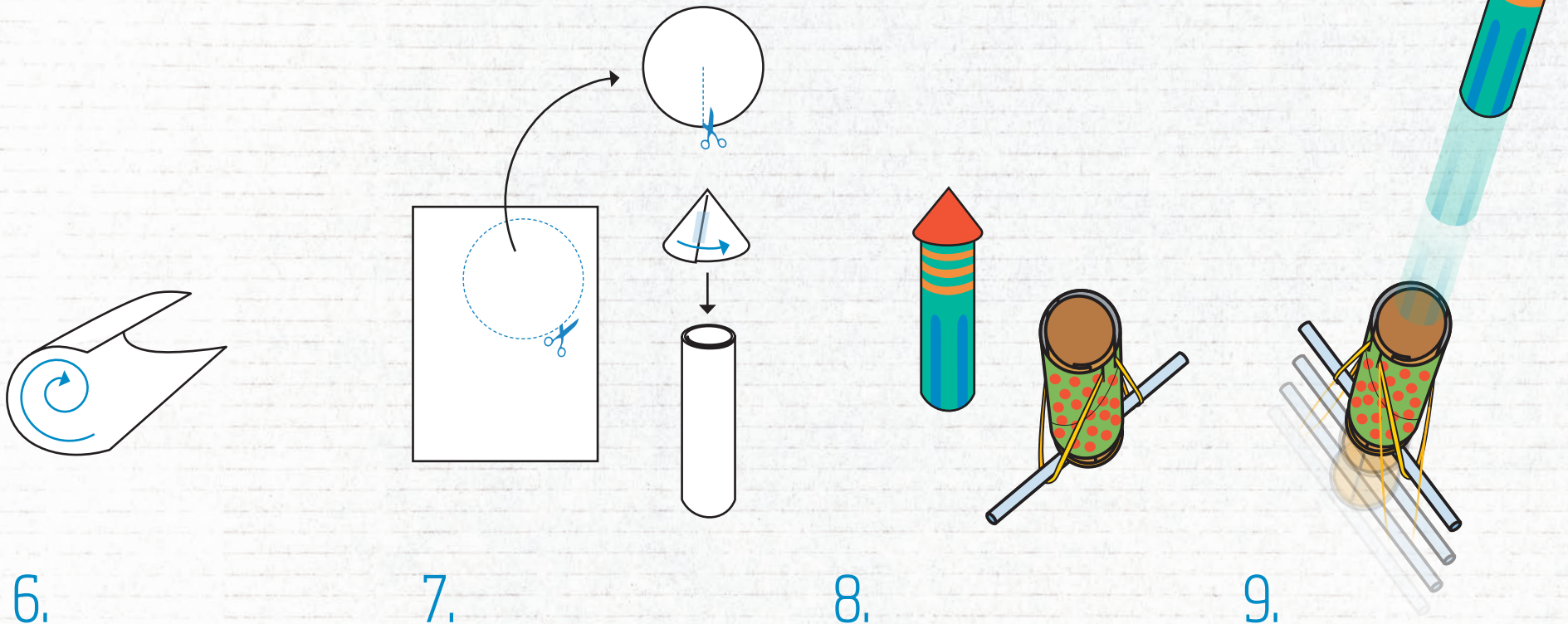
4.

On the bigger tube cut 4 vertical slits, 2 on each side about 1-2 cm apart.

5.

Put the smaller tube inside the bigger one and thread the elastic band through and then loop round the straw.

## INSTRUCTIONS TO MAKE THE ROCKET



6.

Roll a piece of paper into a tube – this is the body of the rocket.

7.

Cut out a circle, cut into the middle and overlap the edges to make a cone. Stick this to the top of your tube.

Think about aerodynamics – how can you make your cone cut through the air efficiently?

8.

Decorate your rocket and launcher.

9.

Place your rocket in the launcher, pull down and release to launch your rocket.

## NEED A CHALLENGE?

If you complete your rocket launcher and want to challenge yourself further:

1. Measure how far it goes, how could you make it go further?
2. Make multiple rockets, playing with shapes and sizes to find which one is the most aerodynamic
3. Fire your launcher on different angles. What happens to the flight of the rocket?
4. Decorate your rocket launcher to make it stand out
5. Film a video and send it to us!

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



[www.facebook.com/TheSmallpeiceTrust](https://www.facebook.com/TheSmallpeiceTrust)




[www.twitter.com/SmallpeiceTrust](https://www.twitter.com/SmallpeiceTrust)  
Use the hashtag **#EngineeringAtHome**



[www.instagram.com/TheSmallpeiceTrust](https://www.instagram.com/TheSmallpeiceTrust)

## STEM Day Risk Assessment

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

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	<b>Slips, trips and falls:</b> 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	<b>Injuries:</b> Injury due to paper cuts, cuts from sharp edges <b>Injuries:</b> 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.	<b>Injuries:</b> Injury due to use as a missile <b>Slips, trips and falls:</b> Injury due to slipping on dropped items <b>Injuries:</b> 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	<b>Injuries:</b> 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	<b>Injuries:</b> Cut to self  <b>Behaviour:</b> Cut to others  <b>Behaviour:</b> Vandalism of property	Students  Students and adults  School or home	Activity supervised by adult supervisor.  Activity supervised by adult supervisor.  Activity supervised by adult supervisor.	M  L  L	Students and adults  Students and adults  Students and adults
6	Testing of projects: bathtub, drop from height, items on floor	<b>Spillage of water on floor:</b> damage and injury due to slip  <b>Slip, trip or fall:</b> Injury due to falling from testing area, tripping over items in testing space	Students and adults  Students and adults	Activity supervised by adult supervisor.  Activity supervised by adult supervisor.	L  L	Students and adults  Students and adults