

SCIENCEOXFORD



Science Oxford Challenge

Tower Building

scienceoxford.com

Tower Building

Build a tower or towers to hang bunting in your window – or make the tallest tower you can and balance a toilet roll on the top!

This is a great opportunity to be as creative as you like! Your tower can be made from any materials and built in whatever way you prefer. We've put together some tips and things to think about below to help you complete your building project successfully.

If your tower is small enough to display it in your window, don't forget to download the Science Oxford Challenge frame to show off your creation..

What you will need: materials to build your tower, a toilet roll for testing

Skills: resilience, spatial awareness, gross and fine motor skills, designing to a specification, testing, evaluation, improving a design, creativity, patience, links to real world science, verbal and social skills, engineering skills, teamwork.

Age group: KS1, KS2

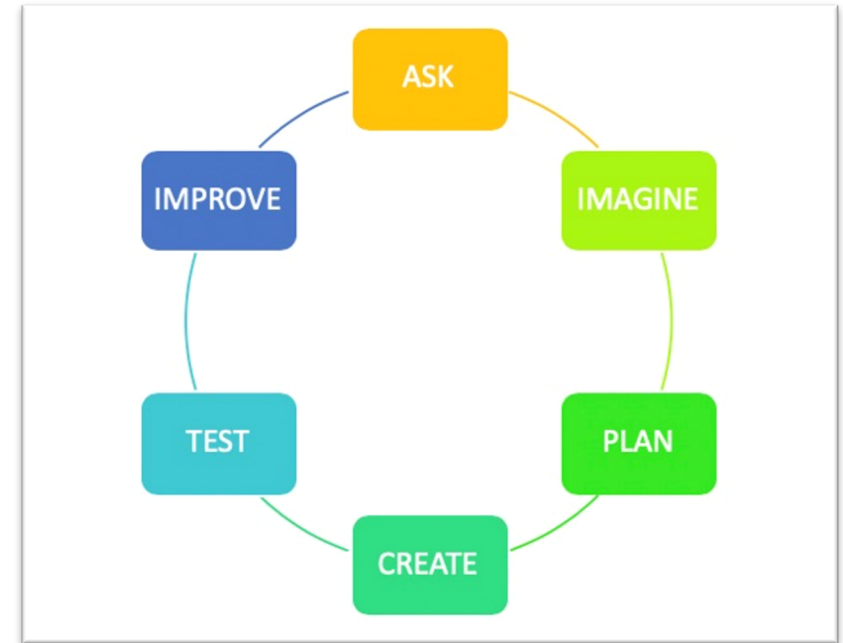


The Engineering Design Process

To come up with successful solutions to problems, engineers follow a process.

Ask: what is the problem? How have other people solved the problem? What criteria do I have to stick to? Why isn't what I tried first working? Think about the challenge you have been set (build a tower) and the criteria you have to stick to (your tower must be tall, your tower must hang bunting or be strong enough to support a toilet roll).

Imagine: what are all the different ways I could solve the problem? This is your brainstorming section and a great time to talk to other people about what they think and their ideas.



Plan: what steps do I need to take? You could draw a diagram and gather your materials at this point.

Create: start building! Don't be afraid to change your plan as you go along – engineers are constantly thinking about and improving their designs.

Test: carefully balance your toilet roll at the top of your tower or hang your bunting. Can your tower support it? Did you achieve all of the criteria?

Improve: did everything work how you wanted it to? Is there anything you could improve? Can you build an even taller tower? Is there anything you want to change? This step takes you back to the start of the process again – you're asking what you can do better, imagining a solution, planning, creating and testing your solution and then thinking again about improvements. You can keep the engineering design process going until you're completely happy with your creation.



Tips for tower building

Think about the three S's: strength, shape and stability:

Strength

Think about what materials you can use to create a strong tower. Is there anything you can do to the materials you are using to make them stronger, like folding, rolling or stacking. Even a material like paper, which is easily cut, torn or crushed, can be very strong if it's rolled into a tight tube, stacked with lots of other sheets or folded into a strong shape.



Shape

There are some shapes that are particularly strong like triangles, circles and hexagons. Can your materials be formed into these shapes?

Cuboid shapes like boxes could also make a successful tower but their shape is not as strong, so you will need to make sure that any cuboids are made from sturdy materials.

The base of your tower will need to be the strongest because it has to support the weight of the rest of your tower.



Stability

If your tower doesn't have a stable base, it will fall over. Think about making the base of your tower the widest point and try to keep your tower balanced, with the weight on each level as close to the middle as you can manage. Since all of your tower materials are pulled towards the ground by gravity, if your tower is wobbly, you could try using heavier materials further up your tower.



Remember to keep testing your tower - build a little bit, test it with your toilet roll and then add on more layers. More helpers will make it easier for you to build a spectacular tower, so see if anyone at home can help you out!

If you're feeling stuck, take inspiration from the amazing designs the Science Oxford team and their families have come up with (pictured in the above pages) - and here are some more ideas for your VE Day 75 bunting.



Share your challenge with us...

Show us what you came up with on Twitter, Facebook or Instagram and tag:

@scienceoxford #scienceoxfordchallenge #scienceathome

or email competition@scienceoxford.com

For more ideas visit www.scienceoxford.com/resources

Check out our other
Science Oxford
Challenges this spring
and summer!

scienceoxford.com

