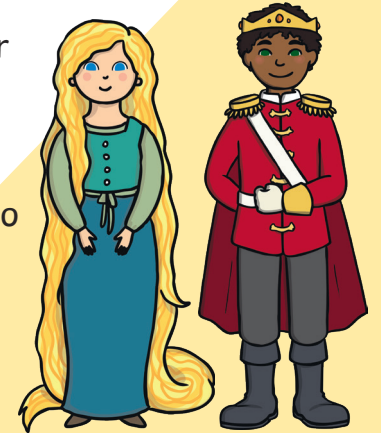# Junk Modelling STEM Challenge Cards

Build a tower for Rapunzel.

Using boxes, cardboard tubes or containers, can you build a tower for Rapunzel? Try to make your tower strong enough to support the weight of a toy. You can then choose a toy to be Rapunzel at the top of the tower.

Competition: Who can build the tallest tower?

Build a pulley.

Take your Rapunzel tower (or a different junk tower) and make a small hole a few centimetres from the top. Push a pencil into the hole, making sure the end of the pencil sticks out a little. Attach a piece of string to a yogurt pot and thread the other end over the pencil. Pull the string dangling from the pencil to move the pot to the top of the tower. Can you use your pulley to carry small items to Rapunzel? Try using it to carry bottle tops, coins or small toys.
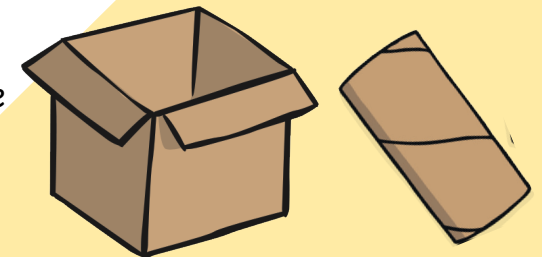
Challenge: Try using different containers for baskets. Which container carries the most?

Build a strong bridge.

Can you build a bridge that is at least 30cm long? You can use any junk modelling materials. Think about how to join them together to increase the strength of your bridge. When your bridge is finished, try to balance some coins or blocks on it. How many objects can your bridge hold before it collapses?

Competition: Whose bridge can hold the most objects?

Make some armour for Eggy.

Ask a grown-up to hard-boil an egg for you. This is Eggy - you can draw a face on him if you like. You are going to drop Eggy from as high as you can reach but before you do, can you make him some armour to stop him from cracking? You could wrap him in paper or put him in a box but think carefully about how to best protect him. Once you are ready, drop Eggy in his protective suit and inspect his shell afterwards. Are there any cracks?

Challenge: Compete with your friends, each dropping your own Eggy from increasing heights, to see whose armour is the most effective.

Make a waterproof coat for Teddy.

Poor Teddy, he hates getting wet in the rain. Using junk materials, such as plastic bags or wrapping, can you make him a raincoat? Don't forget to test your materials first by sprinkling water on them to see if they are waterproof. If you have a cuddly toy like Teddy that would love a raincoat, then you could make one for them instead.

Challenge: Can you also make Teddy a very warm coat? What different materials might you use?

Make a simple bird feeder.

Spread some peanut butter on a cardboard tube using a butter knife and then roll the tube in a tray of bird seed so that the seeds stick to it. Once the tube is covered in seeds, slide it on to the branch of a tree and see which birds come to visit.

Be careful: Make sure an adult helps you with this task and if you are allergic to any of the ingredients, try a different bird feeder. We have lots on our **website.**

Make a marble run.

Can you build a marble run using cardboard tubes and paper plates? What is the highest drop in your marble run?

Challenge: How many marbles can you have going through your run at the same time?

Build a boat for the Gingerbread Man.

Using junk modelling materials, like plastic pots and boxes, build a boat for the Gingerbread Man that can really float. Put a small plastic toy in your boat to check that it can carry passengers without sinking.

Challenge:

How many toys can you fit in your boat?

Build a Junk Maze.

Using a selection of boxes, build a maze. You could either blindfold a friend and direct them around it or you could try driving a remote control toy car or robot through it. Change where the boxes are to make new challenges.

Be careful: If you are blindfolding people, make sure an adult is there to supervise.