

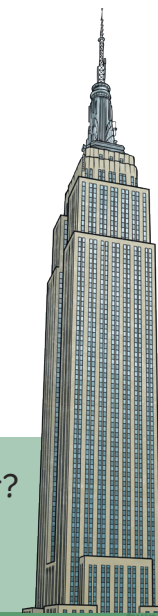
# Junk Modelling STEM Challenge Cards



## Build a Skyscraper.

Junk Modelling STEM Challenge Cards

Research different skyscrapers from around the world. You could find some pictures of the Shard, the Gherkin, the Empire State Building and the Burj Khalifa. Using your research for inspiration, design and build your own model skyscraper out of [junk modelling materials](#).

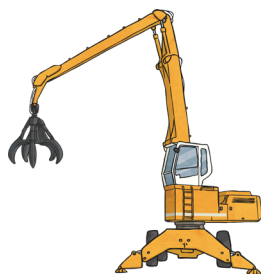


**Competition:** Who can build the tallest skyscraper?

## Build a Crane.

Junk Modelling STEM Challenge Cards

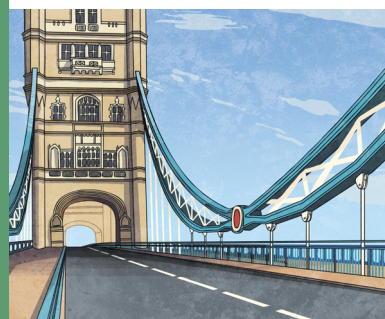
Using junk modelling materials, build a model crane. Can you make it work by using a simple pulley? You could do this by making a small hole and pushing a pencil through the end of the crane arm, then looping a piece of string, with a container attached to the end, over it. If you pull the string, the basket of the crane should move up.



**Challenge:** Can you make a crane with an arm that moves (either up and down, left and right or both)?

## Build an Opening Bridge.

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Research some bridges that have different mechanisms for opening when ships pass underneath them, for example Tower Bridge in London and the Swing Bridge and the Millenium Bridge on the river Tyne. Design and make your own opening bridge.

**Challenge:** How many objects can your bridge hold without collapsing? You could make an estimate and then use toys, coins or blocks to test it.

## Make a Bird Feeder. Junk Modelling STEM Challenge Cards



Melt some butter or lard, then stir in some bird seed. Keep adding the seed slowly, until you have a thick mixture. You can also add raisins, nuts or cheese. Then, put the mixture into a yogurt pot and place it in the fridge to set. When it is hard, put some string or ribbon around the pot and hang it in your garden for the birds to enjoy. You could even try using different containers to make different shaped feeders. Which are the most popular and why?

**Be careful:** Make sure an adult helps you with this task, especially melting the butter or lard.

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## Build a Cargo Ship. Junk Modelling STEM Challenge Cards

Using junk modelling materials, like plastic pots and boxes, build a cargo ship that can really float. Think about how to make the base of your ship as flat as possible, in order to provide space to stack your cargo. You could use blocks, small boxes or toys to represent the goods.

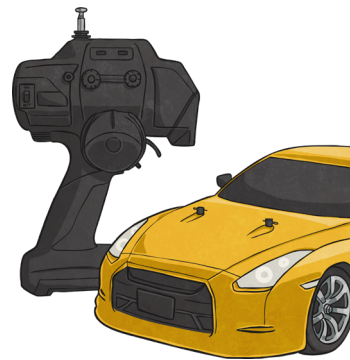


**Challenge:** How much cargo can you stack on your ship before it starts to sink?

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## Build a Junk Maze. Junk Modelling STEM Challenge Cards

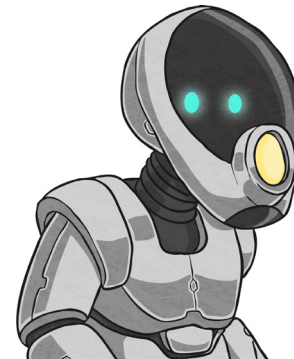
Using a selection of boxes, cardboard tubes and other materials, build a maze. You could either blindfold a friend and direct them around it or you could try driving a remote control toy car or robot through it. Change where you put the objects to make new challenges.



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

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## Build a Junk Robot. Junk Modelling STEM Challenge Cards



Can you design and build a junk robot? What objects and materials could you use to make it really strong? How could you incorporate movement into your design?

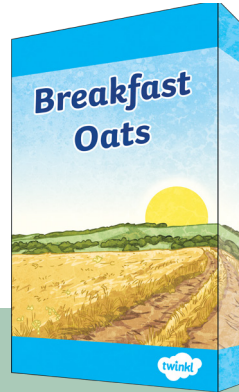
**Challenge:** Can you build a robot to complete a specific task in your house, like lay the table? It doesn't have to actually work but think about what features it would need to do that job, e.g. a washing up robot would need waterproof arms.

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## Build a Waterproof Toy Den.

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Design and build a den for your toy using boxes and other junk materials. Can you make it waterproof in case it rains? Test the materials you are going to use before you build it. Which ones are most effective at keeping out water?



**Challenge:** If you have any very large boxes, can you build a waterproof den for yourself? Can you add windows and a functioning door to the den you have created? Think about suitable materials for the windows which will let in light but not water.