

Fun/STEM/HE

Activity

Five



## Building Challenge!

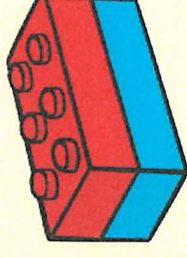
Build a rocket.



twinkl.co.uk

## Building Challenge!

Make a sculpture using exactly 18 bricks.



twinkl.co.uk

## Building Challenge!

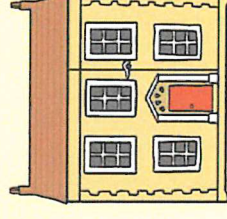
Create a pattern using building bricks.



twinkl.co.uk

## Building Challenge!

Build a model of your house using building bricks.



twinkl.co.uk

# STEM Challenge: Perfect Playground Design

## An Activity Linked to Unicef's Playground Challenge

Article 31 of UN Convention on the Rights of the Child states that **all children have the right to play**. By doing your Playground Challenge for Unicef, you will be helping their work to support children around the world access all of their rights.

Did you know, not all children have safe places to play? If you could design the perfect playground for children anywhere in the world, what would it look like?

### You will need:

- Playdough or modelling clay
- Art straws (or normal ones)
- Cocktail sticks
- Paper, card
- Foil (optional)
- Tape, glue
- Scissors



### What to do:

1. Take a good look around your playground or school field.
2. Discuss and make a list of the features of a 'perfect' playground. What should it look like? What should it have?
3. In teams, draw a plan of what would feature in your perfect playground. You could draw the equipment or markings you would like or search for images on the Internet and stick them on to your plan.
4. Now for the fun part! Select your tools and equipment and work together to build a model of your perfect playground.
5. You may decide to work in pairs or groups to complete the different parts of the design. You could make a list of things that need making and work individually to complete them. Just remember, work together to create your finished model.

# STEM Sound Amplifiers Activity: Engineering Design Process

Sound volume can be increased for various purposes. In fact, scientists and inventors have been working for over a century to create devices to amplify sound.

**Remember the science:** to amplify sound means to make the sound waves taller. Sound waves travel better through some materials than others. Sound cannot travel through a vacuum. The volume of the sound we hear can be increased by funnelling it towards our ears – our outer ears already do this a bit! A hollow 'box' made of hard material can also amplify sound. A small sound vibrates through the hard material and is projected away from the source.

When designing items, engineers use the Engineering Design Process. The steps are:

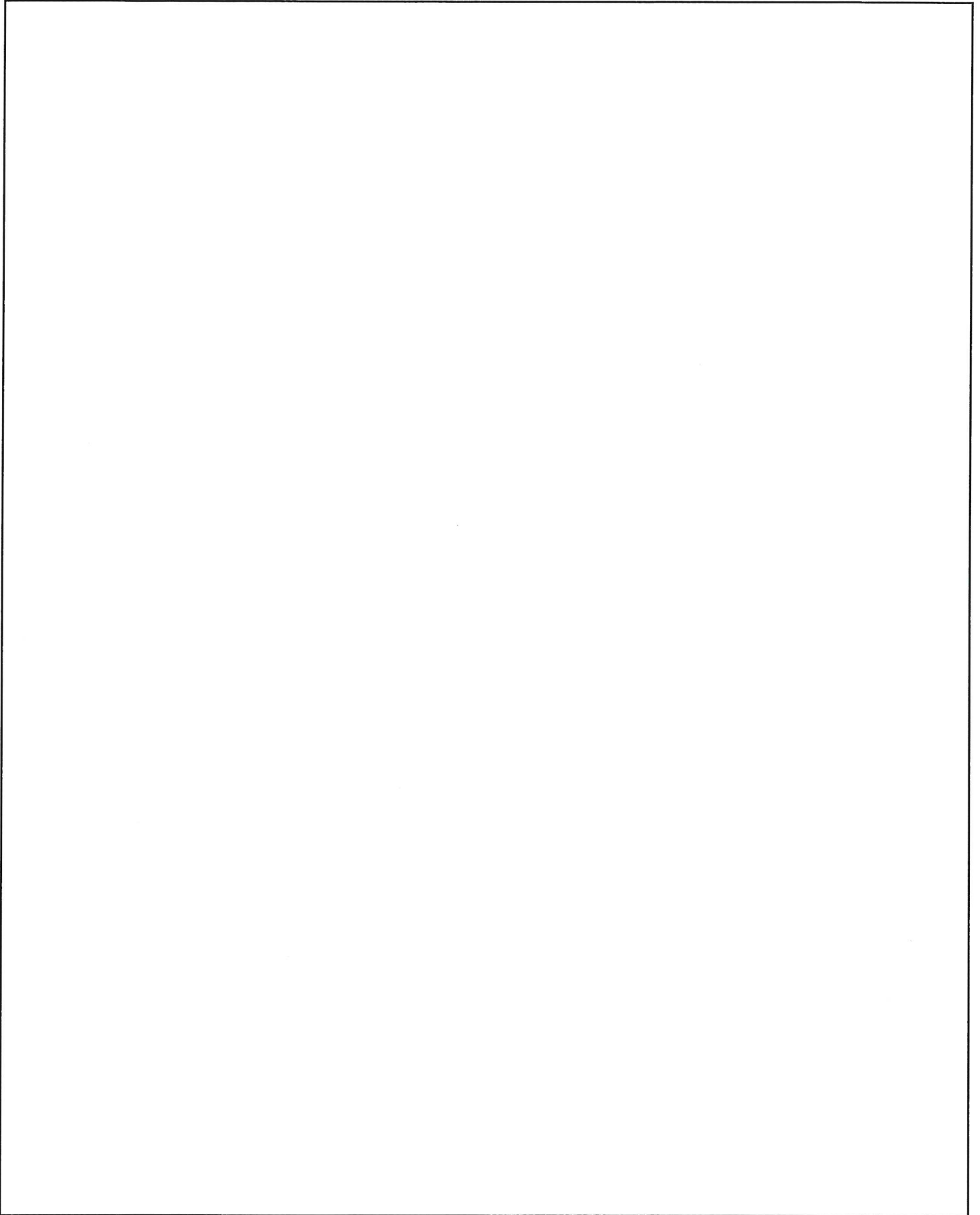
- ask a question about what you can create;
- imagine what you can create;
- plan your creation;
- create it;
- improve your creation.

You have been hired by SoundAmp to create a device that will amplify the sound on a cell phone. How can you engineer a way to make the phone volume louder? You must use readily available household items. Some items you could use are listed below:

- ceramic cup
- cardboard tube
- paper
- ceramic bowl
- drinking glass
- paper cup

You will use the Engineering Design Process to help with your invention. Follow the steps below:

**Imagine and Plan:** Imagine what you could use to amplify the sound on your phone. Plan how you will amplify the sound. Use words and pictures to record your plan below for each item.



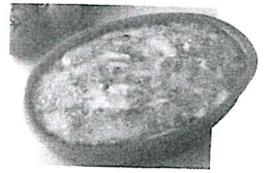
**Test your plans:** Record your results in the table below.

Item Being Tested	Is the Sound Louder or Quieter?	Is the Sound Quality Better or Worse?

**Evaluate:** Every experiment has successes and problems. What problems did you face in this experiment? How will you overcome them next time? What went really well?

**Conclusion:** What were the outcomes of your experiment? Which device worked the best? Why do you think this is, based on your knowledge of sound waves?

## Lazy Lasagne



### Ingredients:

150g mince  
 $\frac{1}{2}$  onion  
1 clove garlic  
Olive oil  
50g cheese  
Lasagne tomato sauce  
 $\frac{1}{2}$  stock cube  
 $\frac{1}{3}$  lasagne white sauce  
Lasagne sheets  
Mushrooms (opt)

### Equipment:

brown chopping board  
vegetable knife  
2 large plates  
dessertspoon  
wooden spatula  
grater  
frying pan  
measuring jug  
grater

### Method:

1. Heat oven electric fan  $180^{\circ}\text{C}$  / gas 4.
2. Boil kettle.
3. Chop onion and garlic.
4. Add a little oil to frying pan. When hot add mince and brown.
5. Add onion and garlic and cook until onion is soft.
6. Dissolve stock cube in 100mls boiling water then add to pan.
7. Next add tomato pasta sauce.
8. Cook on a low heat for 15 minutes.
9. Grate cheese.
10. Layer in dish - meat first, pasta and then sauce.
11. Sprinkle cheese on top and cook in oven for 30 mins until lasagne is soft.