Teaching notes

- **Gluten intolerance consideration** – using spaghetti – especially with children who may put fingers in their mouths

- Good activity for individuals/pairs – larger groups will struggle to work on the structures together

- Focus – building with new materials, creativity
- Ensure everyone in group gets to participate
- Learn from each other by comparing structures
- Draw each shape or structure, add notes to evaluate. Consider – are joins strong? Are lengths of spaghetti even? How could you add strength and stability? etc.
- Ensure children are not building by pressing blutack down onto the table into a flat shape – they should discover that making balls of blutack and pressing spaghetti in firmly creates a strong join – flattened blutack is much weaker – they could investigate this

- Materials – from a sheet of new blutack – cut pieces about 4cm x 2cm per pair – they can half this at first and work individually on the 2D tasks.

STEM Challenge Project

Spaghetti and Blutack structures

Learning Intentions

- To build up our skills such as **teamwork** and **communication**

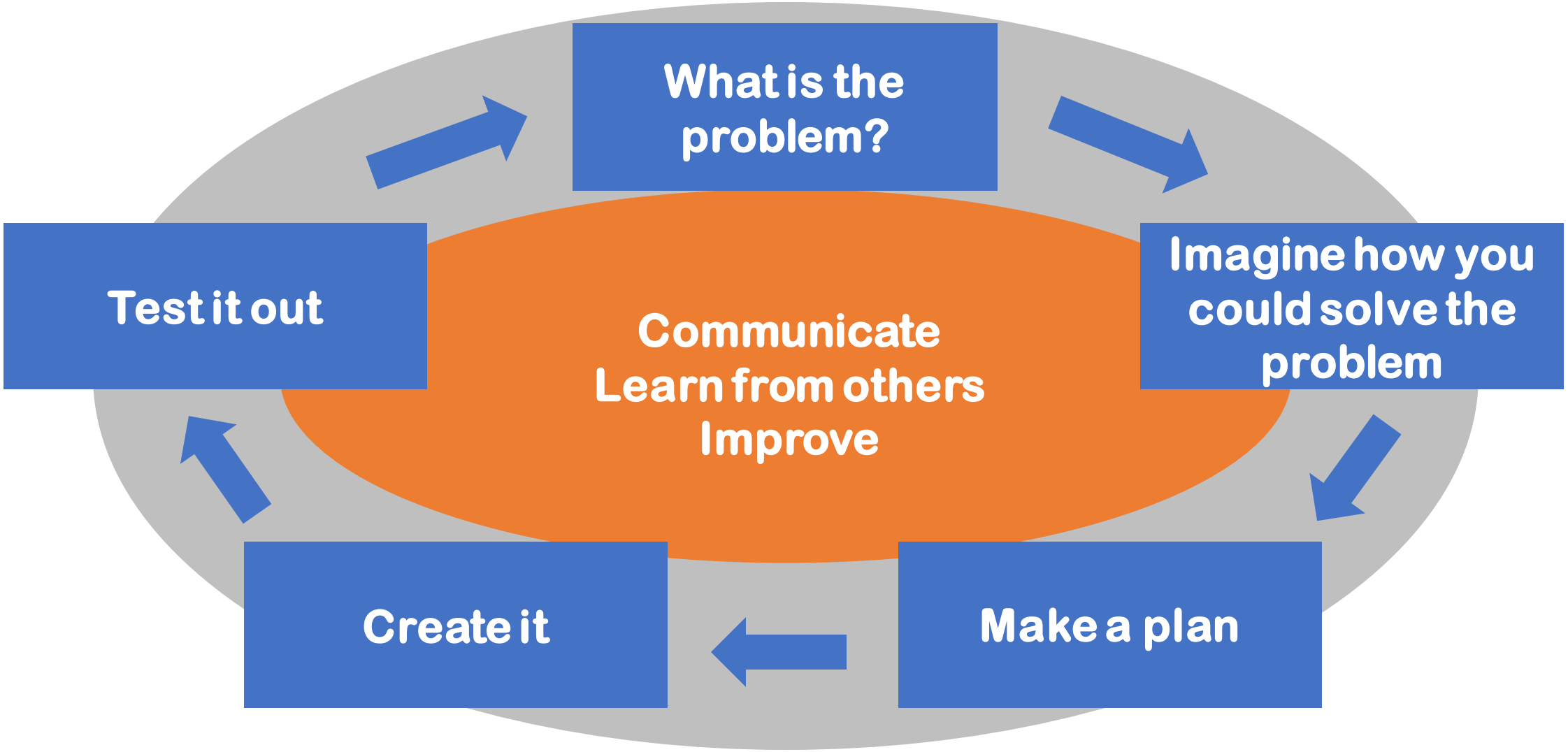
- To use the **engineering design process** to solve a problem

How will you be successful today?

- What does successful **teamwork** look like?

- What can you do to be a good **communicator**?

The Engineering Design Process



Rules for spaghetti and blutack

- Which rules do we need to agree if we are using spaghetti and blutack?

Rules for spaghetti and blutack

- Which rules do we need to agree if we are using spaghetti and blutack?

- Do not put anything in your mouth
- Do not take anyone else's spaghetti or blutack
- All spaghetti and blutack must be returned at the end of the lesson
- Wash your hands at the end of the lesson

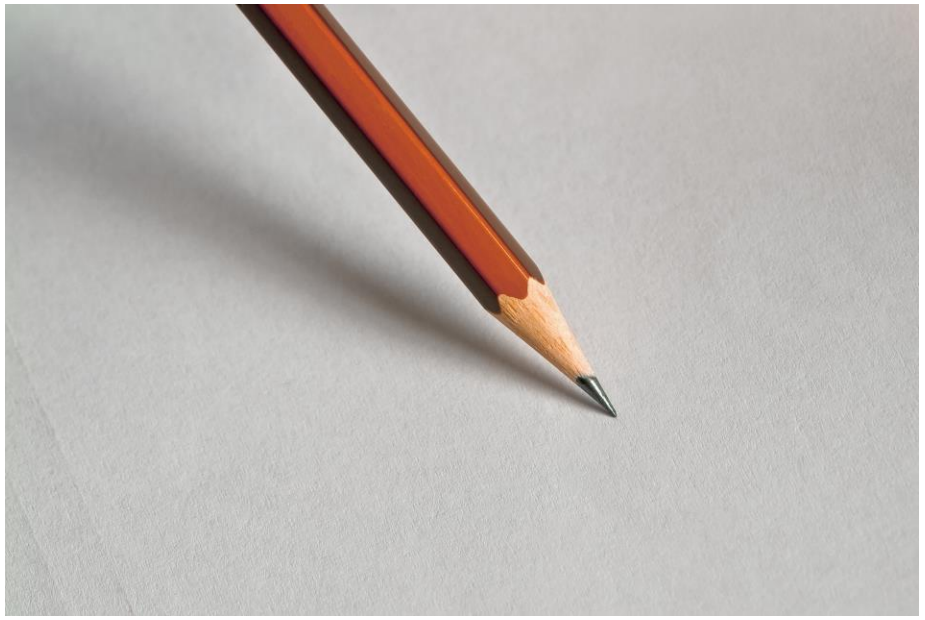
Spaghetti and blutack

- You are going to **investigate building** different shapes and structures
- Break each piece of spaghetti into **4 even pieces**
- Find out how to use blutack to make a **strong join**

Building with spaghetti and blutack

- Each time you build a shape or structure, **draw** it

- **Label** your diagram with anything you **notice** or **discover**



Investigating joins

- **Investigate** how to make a good join

- **Make capital letters** out of spaghetti and blutack

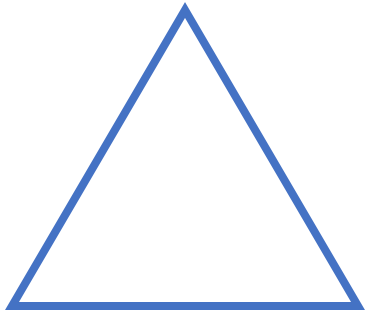
- **How much blutack** do you need to make a good join?
- **How far in** do you need to push the spaghetti?

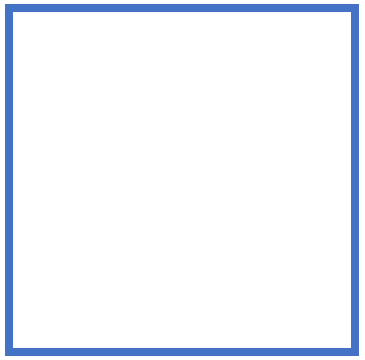
- Materials:
  - **Piece of card to work on**
  - **Dry spaghetti x 2 pieces**
  - **1 piece of blutack**

Building

- **Break each piece of spaghetti into 4 equal pieces – how will you do this?**

1. Build a triangle
2. Build a triangle using 2 pieces of spaghetti for each side – what is the difference?
3. Build a square
4. Build other 2D shapes





- Materials:
  - **Same materials as before – take more spaghetti if you need it**

Strong structures with triangles

- https://www.youtube.com/watch?v=mBHJtWbsiaA Excellent clip - strong structures with triangles

Building

5. Design and build an **animal** – it can be real or imaginary!

- Materials:
  - **Same materials as before – take more spaghetti if you need it**

Tidy up

- **Take apart all models**
- **Spaghetti** in the bin
- **All blutack** and **card** back in the tray
- **Written work** on chair at front
- All **tables and floors** cleared and tidied

What did you learn today?

- What **worked well** for you today?
- What would you **improve** if you were going to make these structures again?
- What did you **learn** about building with these **new materials**?
- **Give high quality, positive feedback to each other**

Evaluation

- Discuss how your team approached the STEM challenge today
  - What did you learn today?
  - Which skills did you develop?

- How could you improve your design?

- Can you think of another similar STEM challenge you could set yourself to try at home?

Self-assessment at end of project

- We have been developing our skills by doing STEM challenges:
  - Teamwork
  - Communication

- How do you think you have developed your skills?

- Which skills do you still need to improve?