

# Teaching notes

- **Gluten intolerance consideration** – using spaghetti – especially with children who may put fingers in their mouths
- Prior learning in First Level – if this has not been done, you may like to use some of the activities from First Level before these activities.
- 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 – using new blutack – use 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



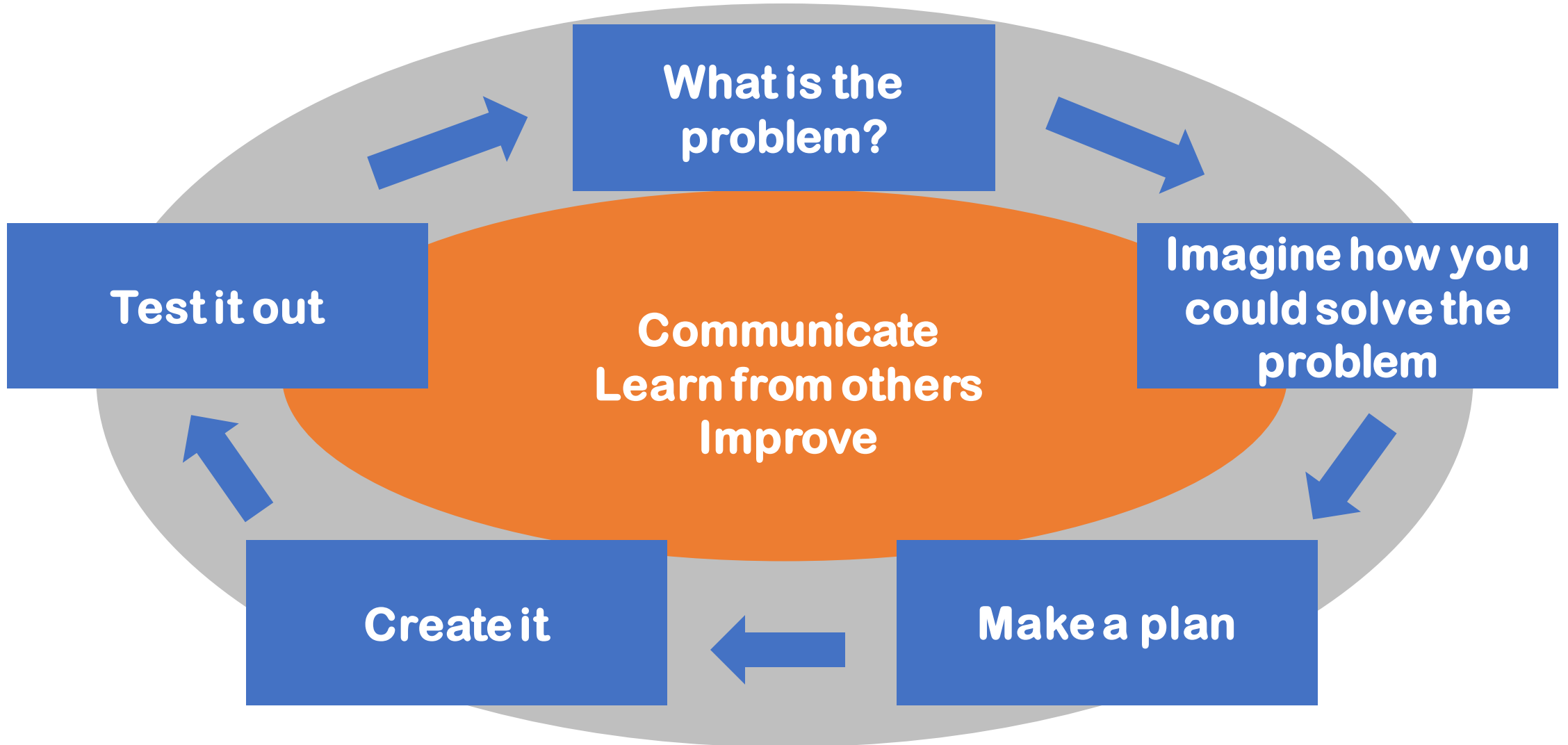
# Learning Intentions

- To build up our **skills**:
  - Teamwork
  - Communication
  - Creativity
  - Critical Thinking
  - Resilience
  
- To use the **engineering design process** to solve a problem

# What are your success criteria for this project?

- I would like to get better at
  - teamwork
  - communication
  - creativity
  - critical thinking
  - resilience
- How can you get better at this? Write down some strategies for yourself.
- At the end you will decide if you have been successful.

# 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**
- Investigate how to use blutack to make a **strong join**



# Building with spaghetti and blutack

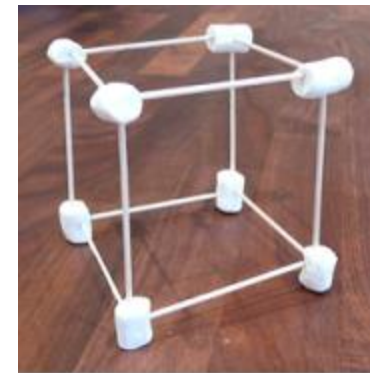
- Each time you build a shape or structure, **draw** it
- **Label** your diagram with anything you **notice** or **discover**



# 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 a cube up from your square – add vertical pieces of spaghetti to each corner, then make another square on top

- **Materials:**
  - **Piece of card to work on**
  - **Dry spaghetti x 3 pieces**
  - **1 piece of blutack**



# Strong structures with triangles

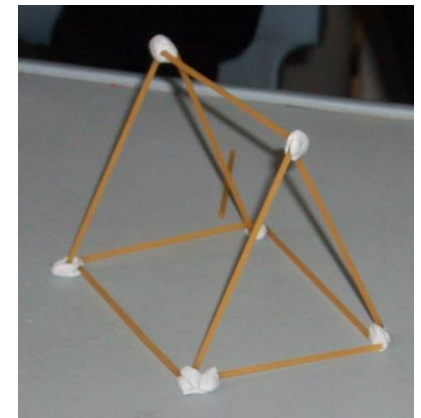
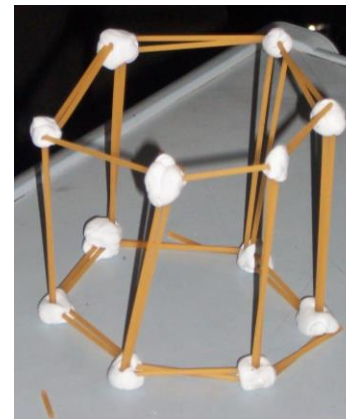
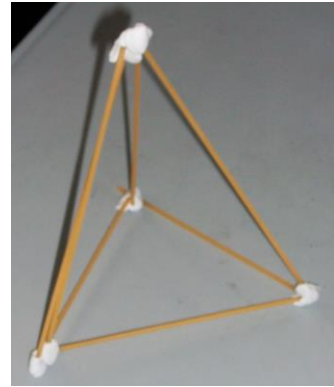
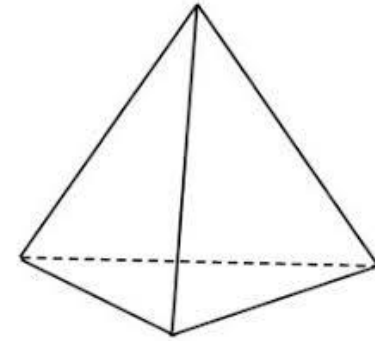
- <https://www.youtube.com/watch?v=mBHJtWbsiaA> Excellent clip - strong structures with triangles
- How could you strengthen your cube using more pieces of spaghetti?

# Building

5. Build a triangular based pyramid
6. Build a triangular based pyramid using 2 pieces of spaghetti for each side – what is the difference?
7. Build other 3D shapes
8. Build a **tower** as tall as you can

- 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 can you learn from others?

- **Learning loop** – look at other people’s work.
- How did other groups tackle the STEM challenge?
- Which ideas did you see that were successful?
- What did you see that hadn’t worked, or that you wouldn’t use?

# 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
  - Critical thinking
  - Creativity
  - Resilience
- Update your previous self-assessment sheet.
  - Tick the boxes to show how you feel about each skill.
  - Circle the skills you feel you have developed during these STEM challenges.



# An extra idea - Spaghetti bridge

- <https://www.youtube.com/watch?v=xN0polrm0q8> Spaghetti bridge - watch from about 1:00 – 4:00 – may be ads – check first