

# Teaching notes – Hanging weight challenge

- This challenge allows learners to design and build a structure, consider how to improve it, and to have time and resources to completely re-build their structure.
- The cup must hang below the centre of the structure
- Weights – you can use anything that can fit into the cup and provide enough weight to make this a challenge! Different levels of learners could have different weights. Avoid using water if doing indoors!
- The string provided needs to be long enough to secure the cup to the structure – with younger learners consider how this could be done without damaging the cup (no holes, etc.)
- Have rulers and measuring tapes available
- Safety – discuss with learners how to reduce the risk of injury due to falling weights e.g. don't put any part of your body directly underneath the cup
- Emphasise that cups must be returned so they can be reused for other learners
- Point-scoring is optional but can add another layer to this challenge. Ask learners what they would like to score points for – different teams may wish to challenge themselves in different ways.

# STEM Challenge Project



Hanging weight  
challenge



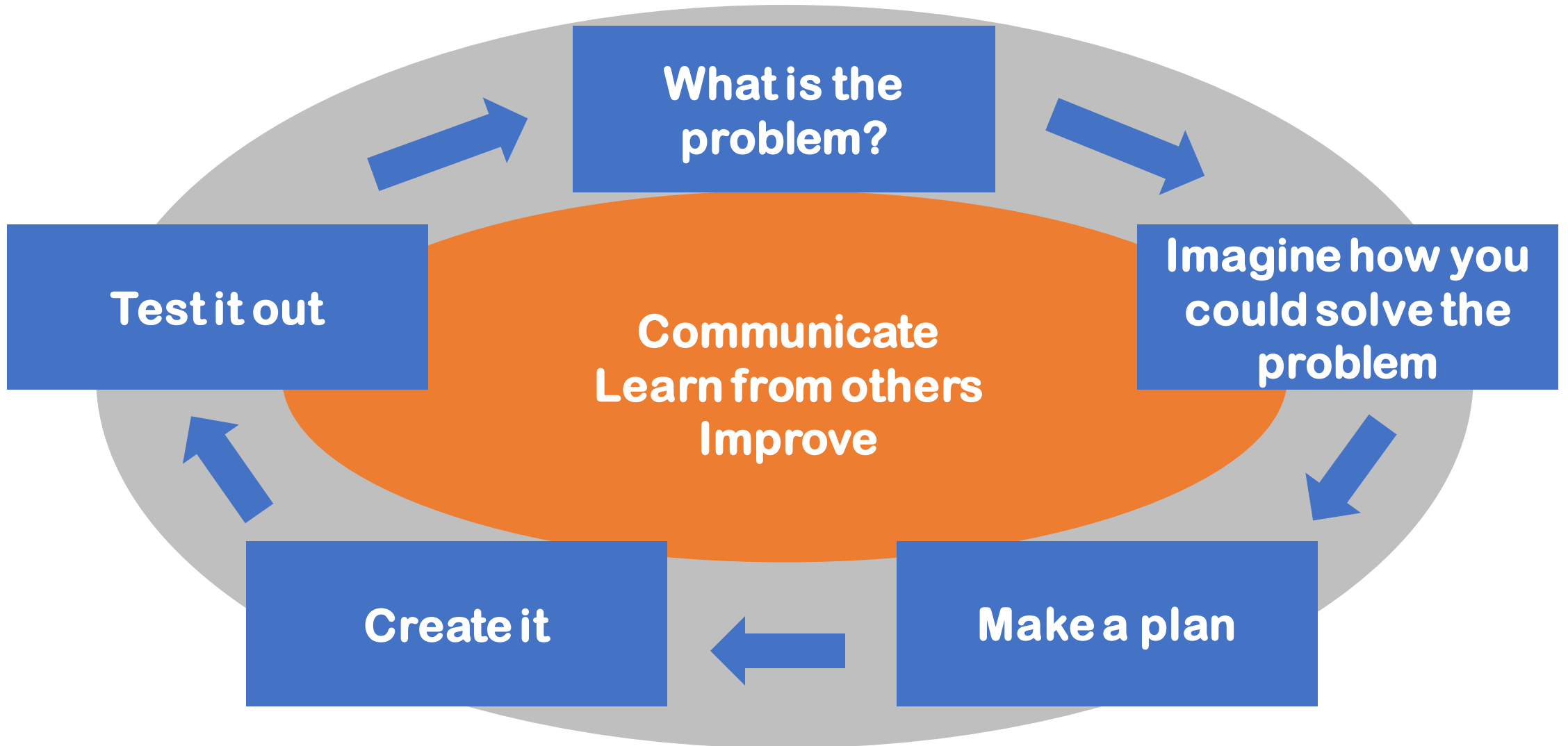
# Learning Intentions

- 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.
- As you progress through the project, you will decide if you have been successful at developing this skill.

# The Engineering Design Process



# Hanging weight challenge – First Level

- Design and build a **structure between 2 chairs to support a cup holding weights hanging down in the centre**
- The chairs must be **at least 40cm apart**
- You can stick the structure to the top of the chairs
  
- You will be given the following materials:
  - **1 cup – you must return this**
  - **1 piece of string**
  - **Weights**
  - **A4 paper – 3 pieces at a time**
  - **Sellotape – must be cut into small pieces**
  
- Test your design.
- Start again – you may have **3 pieces of paper for each attempt**. Can you increase the gap between the chairs each time?

# Hanging weight challenge – Second Level

- Design and build a **structure between 2 chairs to support a cup holding weights hanging down in the centre**
- The chairs must be **at least 50cm apart**
- You can stick the structure to the top of the chairs
  
- You will be given the following materials:
  - **1 cup – you must return this undamaged at the end of the challenge**
  - **1 piece of string**
  - **Weights**
  - **A4 paper – 3 pieces at a time**
  - **Sellotape – must be cut into small pieces less than 3 cm long**
  
- Test your design.
- Start again – you may have **3 pieces of paper for each attempt**. Can you increase the gap between the chairs each time?

# Hanging weight challenge

- What are the problems with this task?
- What can you predict being difficult?
- Imagine how you could solve each problem.



# How can we score points for this challenge?

- What are your ideas?

# How can we score points for this challenge?

- Score points for **extra weight** in the cup?
- Score points for **extra distance** between the chairs?
- Score points for **using less Sellotape**?
- Score points for **great teamwork**?

# Evaluation



- On a pink post-it, write down what you are **Tickled Pink** about – what is good about your design?
- On a green post-it, write down what is **Green For Growth** – what needs to be improved about your design?
- Or you could use pink and green highlighters to draw straight on to your design!





# 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?
- **Feed back to your group**



# Evaluation

- Discuss how your team approached the STEM challenges in this project
  - What did you learn?
  - Which skills did you develop?
- How could you improve your designs?
- 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:
  - Collaboration
  - Communication
  - Critical thinking
  - Creativity
  - Resilience
- Have you followed your strategies?
- Have you been successful in developing your chosen skill?
- Have you developed other skills during this project?