

Teaching notes

- First and Second level challenges
- Focus – strong and stable structures
- 6 parts to make: base, struts, pole, hoop and net, backboard, ball
- Use of materials – label design sheet with C / P (card / paper) to show how you are going to use each material
- Ensure team is divided up into making some of the parts each
- Learn from each other by comparing structures – wide base, strong pole, well attached struts lead to a more stable structure that can support the weight of the hoop and force of the ball hitting it. Compare with Eiffel Tower. Extension – could use more heavy ball to test stability
- Resourcing: Net – Cut a nectarine/plum punnet net into 4 pieces – just make hoop without net if this is unavailable

STEM Challenge Project



Basketball hoop



Learning Intentions

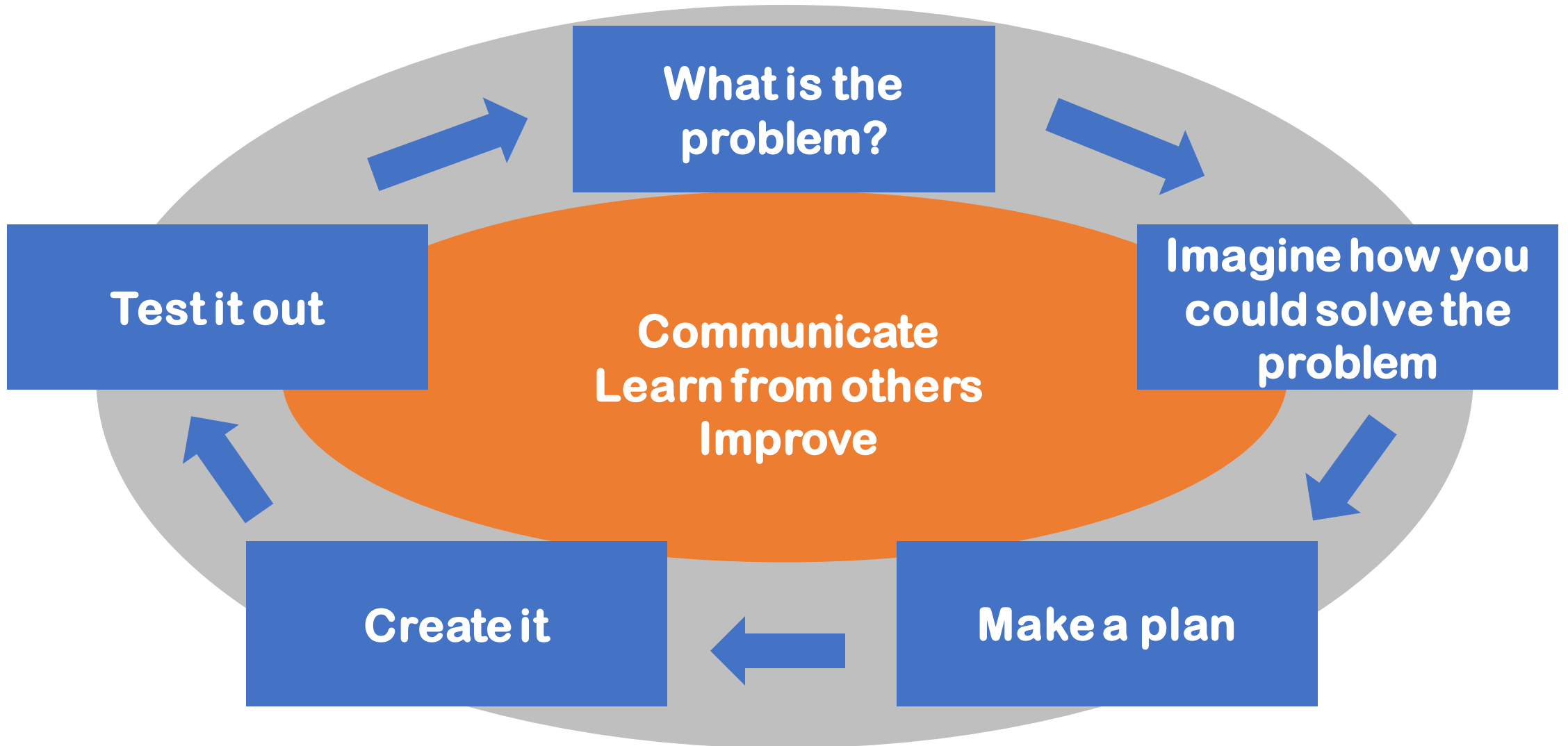
- To build up our **skills**:
 - Teamwork
 - Communication
 - Creativity
 - Critical Thinking
 - Resilience

- 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



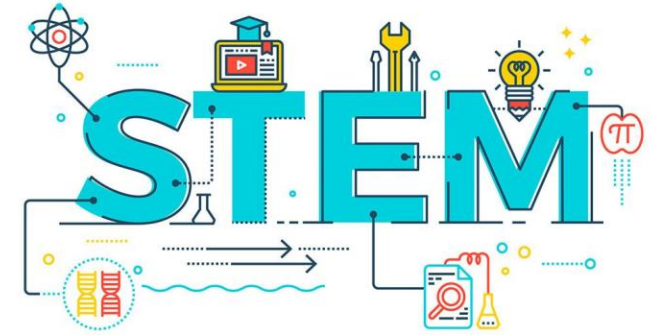
Basketball hoop



- Which **parts** will you need to include in your design?
- How can you make sure that the basketball hoop is **strong** and **stable**?
- What **could go wrong** when building and testing the model? How could you **solve** these problems?



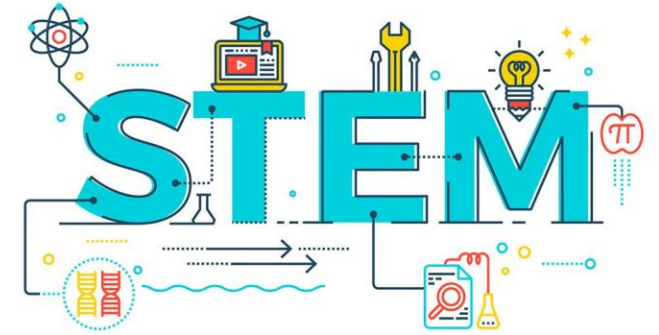
Design and build First level



- **Design** a basketball hoop and ball that you can fit on your table
- Think about how to make the basketball hoop stand up using **struts** and a **base**
- You don't need to make the net, just a **hoop** to throw the ball through

- **Build a model** of the basketball hoop, then **test** and **improve** it
- Materials:
 - **A4 Card x 1**
 - **Paper x 2**
 - **Sellotape**

Design and build Second level



- **Design** a basketball hoop and ball that you can fit on your table
- The structure must be **at least 25cm high**
- Think about how to make the basketball hoop stand up using **struts** and a **base**

- **Build a model** of the basketball hoop, then **test** and **improve** it
- Materials:
 - **A4 Card x 1**
 - **Paper x 2**
 - **Net x 1**
 - **Sellotape**

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**



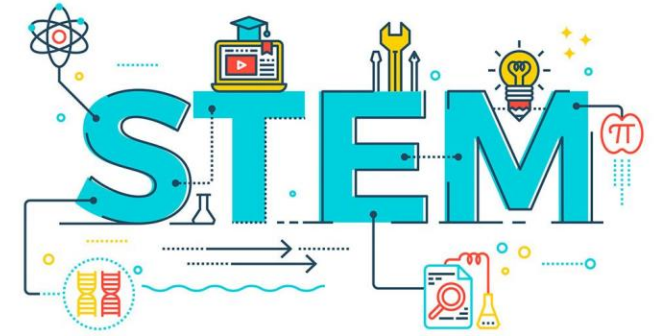
Evaluation

- 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?

STEM design - extra activity



- Design a **basketball stadium**
- How will people get in and out?
- How will the audience get to their seats?
- Include toilets, food stands, changing rooms for the players