

Teaching notes

- Good activity for pairs/3 max – larger groups will struggle to work on the structure together
- First and Second level challenges
- Focus – strong and stable structures – the sports structure must include pillars/poles/struts etc so for example a dance studio or swimming pool is not an option. Discuss and agree a list of possible structures with the class in advance of teams choosing a structure. The images in this PowerPoint provide some ideas (rugby, horse jump, tennis, Quidditch (Harry Potter), badminton, hockey, American football).
- Some options e.g. rugby posts are easier than others e.g. table tennis table – you could differentiate your list into mild/spicy/hot, or make some structures harder e.g. if you choose rugby you must make 2 sets of rugby posts
- Use of materials – label design sheet with C / P (card/paper) to show how you are going to use each material – how are you going to build – roll / cut / fold etc?
- Ensure team is divided up into making some of the parts each
- Learn from each other by comparing structures – strong poles with well attached struts lead to a more stable structure.

STEM Challenge Project



Sports structure –
your choice!



Learning Intentions

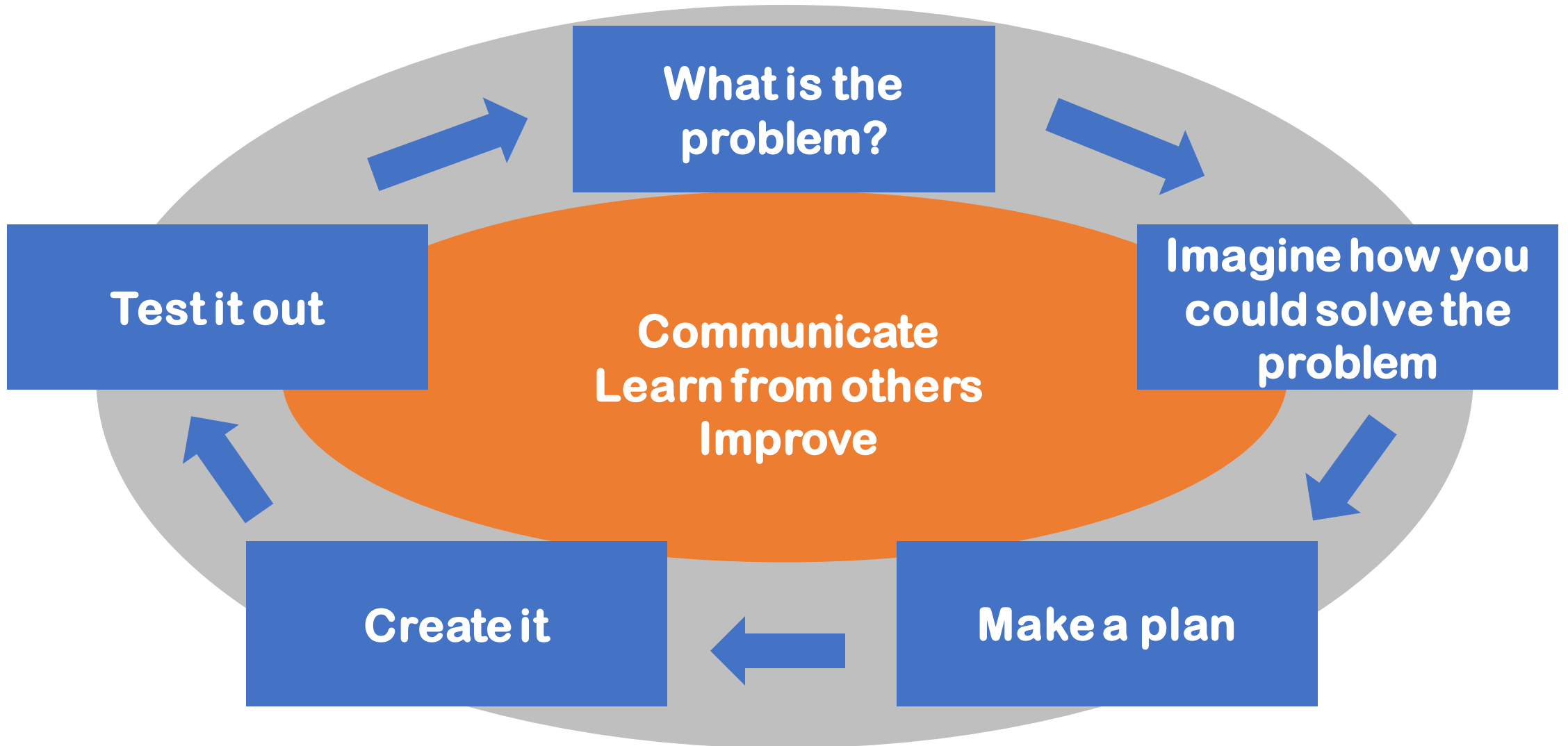
- To build up our **skills**:
 - Teamwork
 - Communication
 - Creativity
 - Critical Thinking
 - Resilience

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

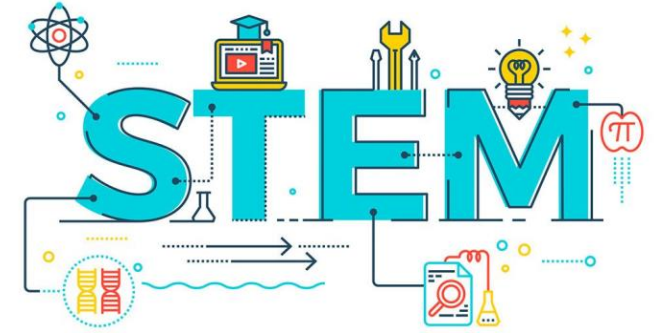
What are your success criteria for this project?

- 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

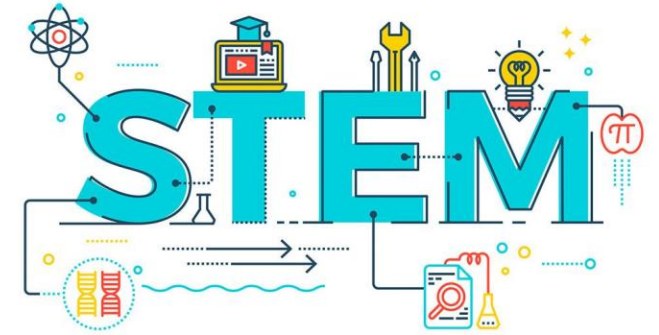


Previous learning



- What have you **learned already** about how to make a structure **strong** and **stable**?
- What can you do with **paper** to make it stronger?

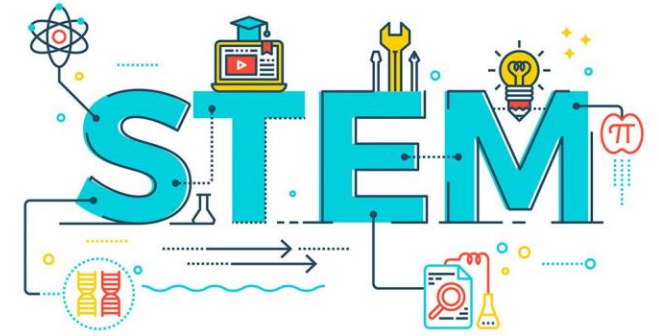
Your choice



- Discuss which **sports structure** you could build – **it must include pillars or poles**. Consider if there is any **equipment** you would need to construct.
- How can you make sure that the model is **strong** and **stable**?
- What **could go wrong** when building and testing the model? How could you **solve** these problems?

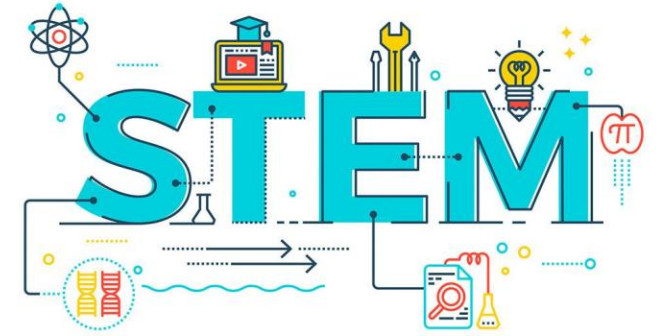


Design and build First level



- **Design** sports equipment of your choice that you can fit on your table
- **Build a model**, then **test** and **improve** it
- Materials:
 - **A4 Card x 1**
 - **Straw x 1**
 - **Paper x 3**
 - **Sellotape**

Design and build Second level



- **Design** sports equipment of your choice that you can fit on your table
- **Build a model**, then **test** and **improve** it
- Materials:
 - **A4 Card x 1**
 - **Paper x 3**
 - **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?