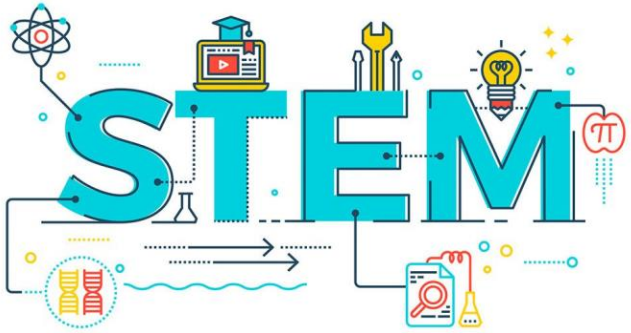
Teaching notes

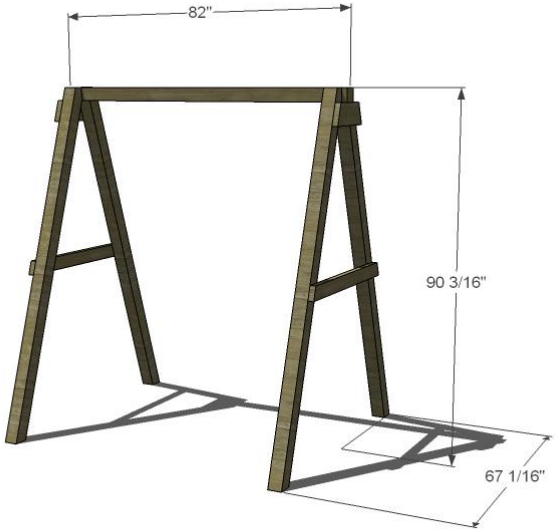
- This challenge is suitable for First or Second Level
- You may wish to change the materials available to suit what you have in your setting
- Learners should consider what makes a good swing e.g. strong and stable structure, length of string, size of seat...
- Many different designs are possible – different frames, different types of swing seat, single or multiple swings...
- As an extension, learners could build a climbing frame with swing section attached

Build a park!

STEM at the park?



- What is an **A-frame** structure and where can it be used?
- https://en.wikipedia.org/wiki/A-frame



STEM Challenge Project

Swing

Learning Intentions

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

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

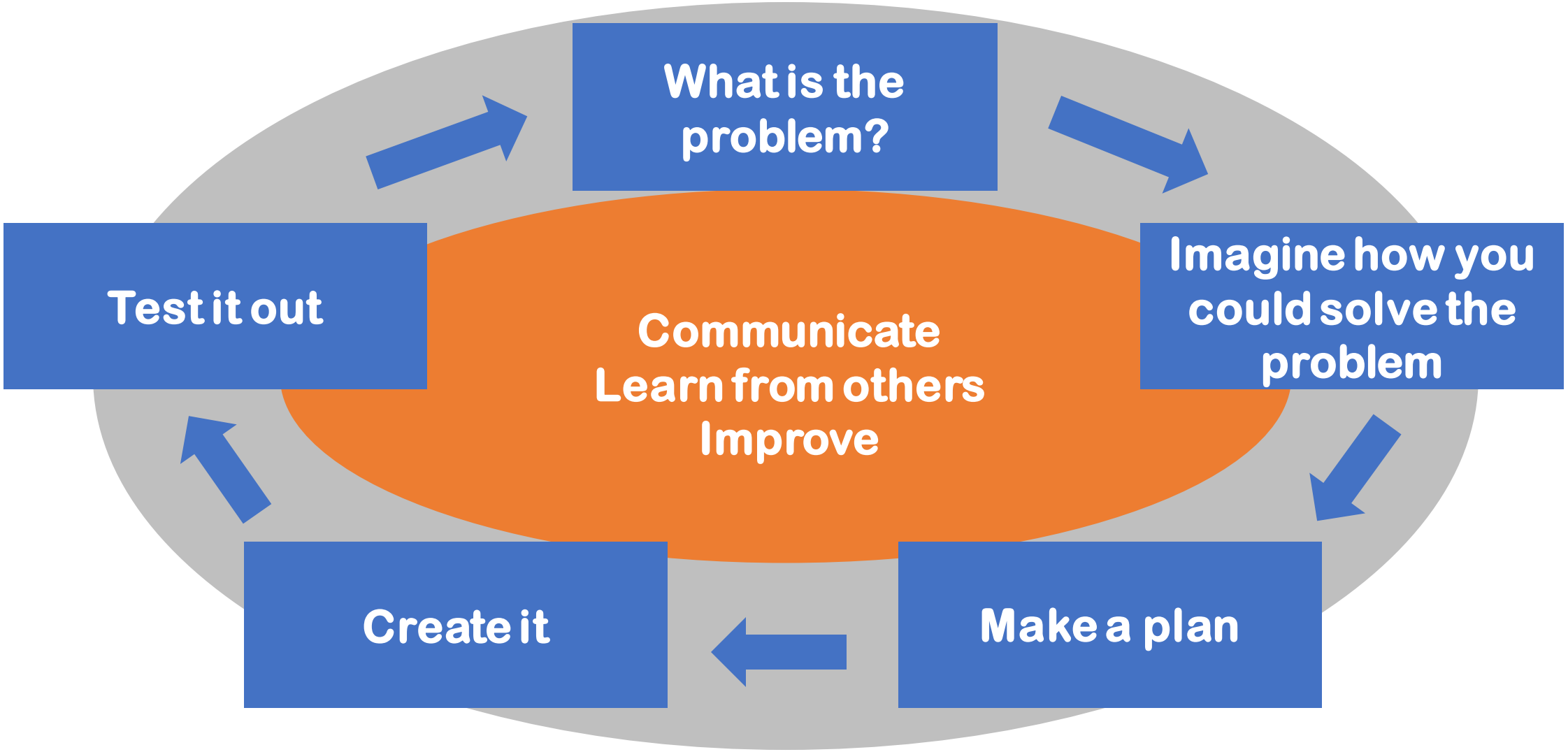
What are your success criteria for this project?

- 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.

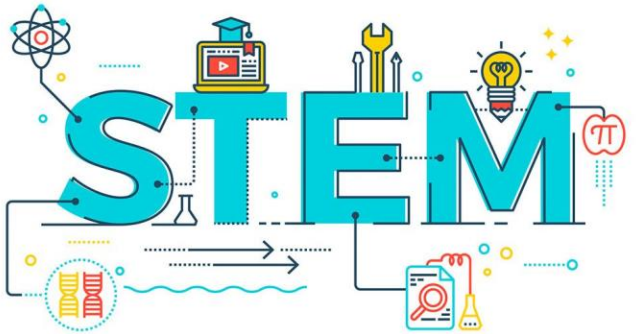
The Engineering Design Process



Imagine and plan

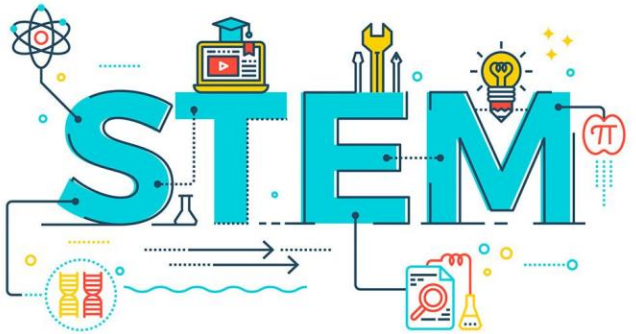
- Design a **swing**
- Materials available:
  - **A4 paper x 3**
  - **Card x 1**
  - **String**
  - **Recycled materials such as packaging**
  - **Sellotape**
- How can you make sure that your design is **strong** and **stable**? Consider the **A-frame structure** and using a **base**
- What **could go wrong** when building your design? How could you **solve** these problems?

Create



- **Build** your design using your materials
- Try to make your design **strong** and **stable**
- How could you **test** your design?
- Ask **questions**!

Improve



- How could your design be **improved**?
- You could try **re-building** it with your improvements

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?