

# Teaching notes

- About 2m string per group is enough but you could try longer zip wires if you like.
- Consider where each group can work so you have a safe fire escape route without strings crossing it
- Groups will have to decide for themselves if the cargo has arrived safely – some can be more careful than others! Can learners come up with a better way to judge if the cargo arrives safely?
- Learners may quickly “finish” but remind them the challenge is to slow down the cargo as much as possible to keep the eggs safe – link to friction, materials that increase friction e.g. brakes
- For Part 2, use materials from the PE cupboard – adapt if necessary!

# STEM Challenge Project

Zip wire  
challenge



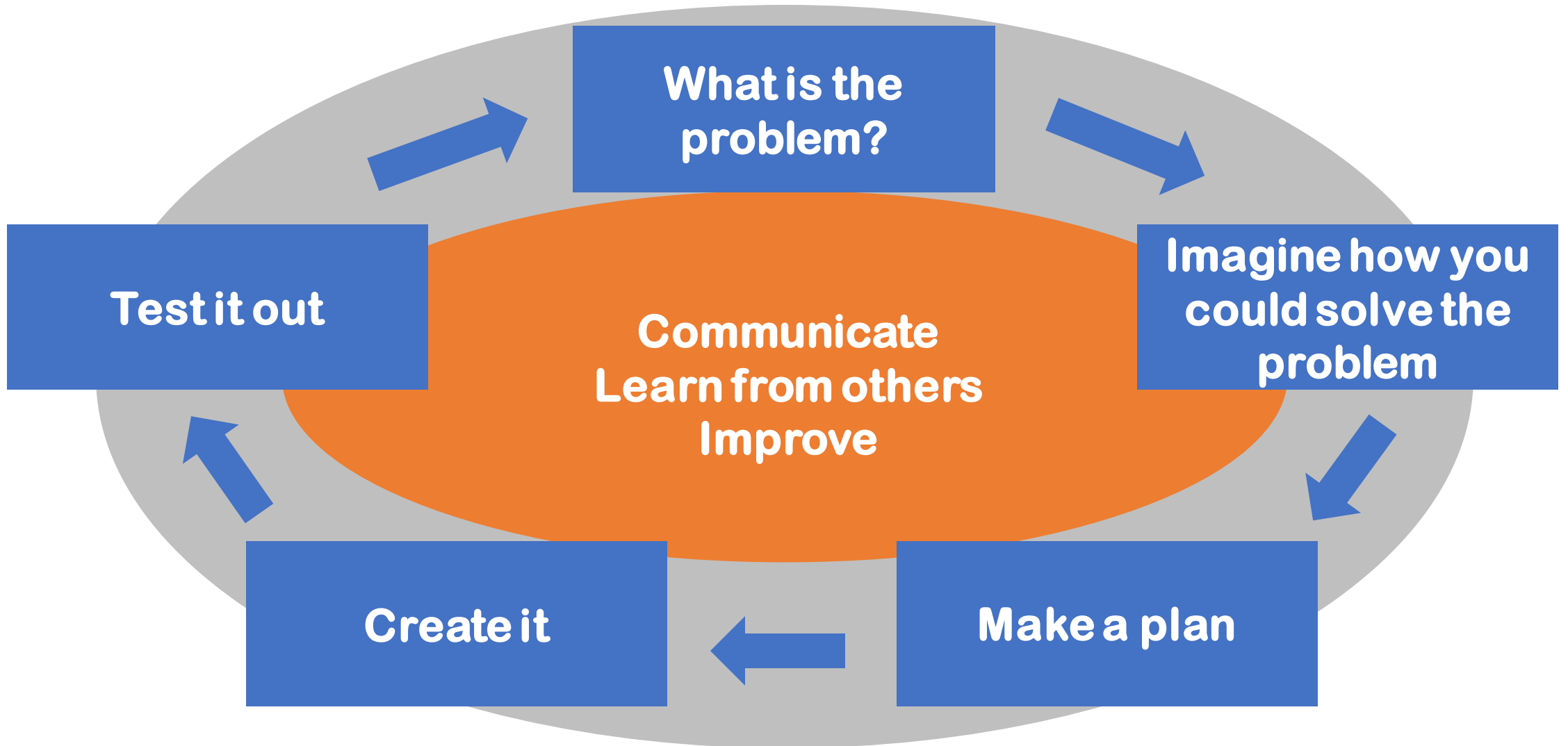
# Learning Intentions

- 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.
- At the end you will decide if you have been successful.

# The Engineering Design Process



# Zip wire challenge

- You are a dragon researcher who has discovered an abandoned dragon nest at the top of a mountain. There are 3 eggs inside.
- You have been given the task of safely transporting the 3 dragon eggs from the nest to your research station below.
- You have been advised that the only way to do this is by a zip wire.
- If the dragon eggs break or fall out you will not be able to complete your research.



# STEM Challenge

- Design and build a **zip wire** which can safely carry 3 marbles from one end to the other. The **marbles** represent the dragon eggs.
- The top of the zip wire must be on the **top of your desk**. The bottom of your zip wire must be on a **chair** but you can decide where.
- You will be given a choice of materials:
  - **Straws – max 3**
  - **Lollypop sticks – max 2**
  - **Pip cleaner – max 1**
  - **Card scraps – max 2**
  - **Foil – 1 piece**
  - **String – 1 x 2m piece**
  - **3 marbles in a pot (you cannot use the pot)**
  - **Sellotape**
- Test your zip wire and try to improve it



# Zip wire challenge

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







# 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?

# STEM Challenge Project

## Zip wire challenge

Part 2



# Learning Intentions

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

# Zip wire challenge

- You are a dragon researcher who has discovered an abandoned dragon nest at the top of a mountain. You have learned how to transport 3 dragon eggs using a zip wire to your research station below.
- You have now been given the task of safely transporting the nest and a variety of research equipment using the zip wire.
- If the nest and equipment falls out or becomes damaged you will not be able to complete your research.



# STEM Challenge

- Design and build a **zip wire** which can safely carry a beanbag and several balls from one end to the other
- The top of the zip wire must be on the **top of your desk**. The bottom of your zip wire must be on your **chair** but you can decide where.
- You will be given a choice of materials:
  - **Paperclips – max 2**
  - **A4 paper – max 3**
  - **String – 1 piece (plus your current zip wire string)**
  - **Sellotape**
- Test your zip wire and try to improve it





# 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?