

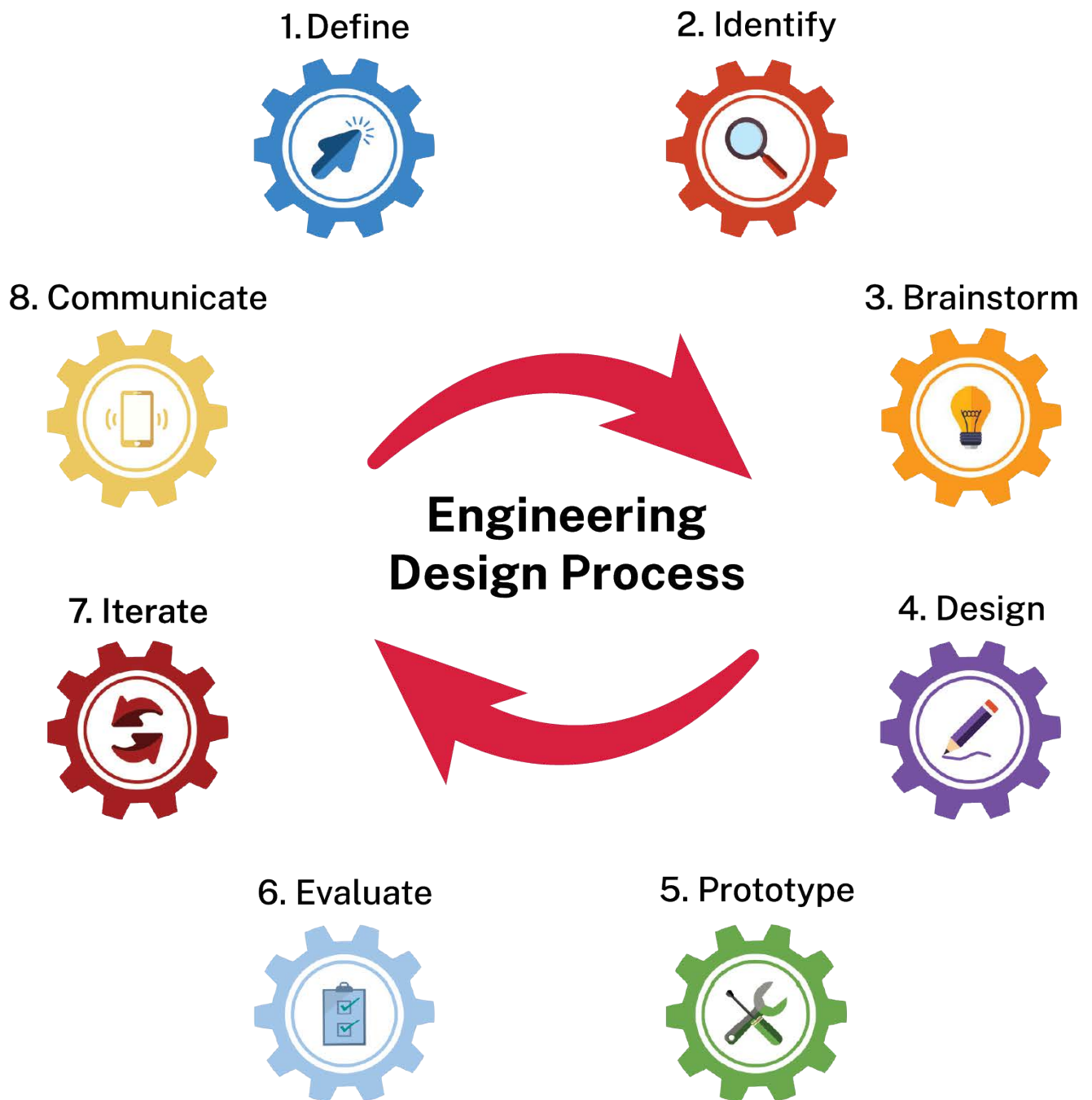
STUDENT DESIGN FOLIO

Name:



The Engineering Design Process

The engineering design process is a set of eight steps that helps you solve problems and build useful creative solutions. This folio will guide you through each step to help you design and make something that works.

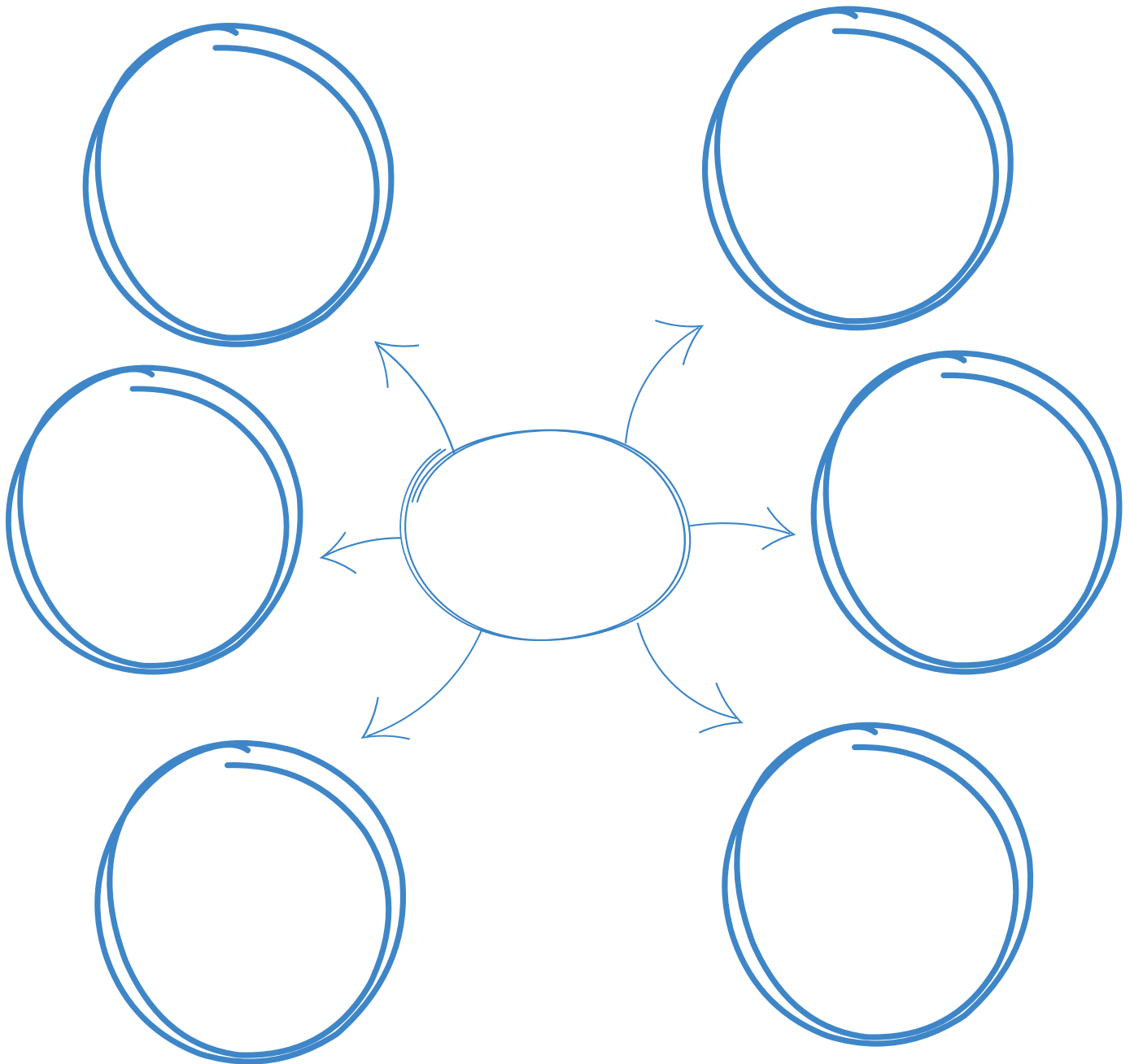




Define – clarify the driving question or problem

Design brief statement: A short sentence that explains the problem or challenge you need to solve and what you need to do. I need to design/make/build a _____ that will _____

Think about the problem and who will use your design. Talk with others if you can, for example, classmates, teachers or family to get ideas. Use the mind map below to help you organise your thoughts.



Draw a picture with labels or write short sentences to explain your thinking.



1. What needs to be done to solve the problem?

2. Who is this design for?

3. What should it be able to do?

4. What might be tricky?

It might be
hard to...

Identify –think, ask questions, research and plan



What is already known about the problem?

What might be tricky in this task?

- ☐ time
- ☐ size
- ☐ safety
- ☐ materials
- ☐ ?

The design will work if...

What needs to be discovered?

Materials needed

This problem is important because...



Things to be curious about





Things discovered during research



Example design



Design idea

The plan

first, _____

then, _____

still need to _____

Brainstorm – encourage curiosity and generate ideas



Draw a few small sketches or pictures of different ideas that could help solve the problem. Add words, short sentences or labels to explain the thinking.

Circle the two drawings that best solve the problem.



Idea 1



What is it? _____

Why it might work? _____



Feedback

something
they liked



another thing
they liked



something
to improve



Idea 2



What is it? _____

Why it might work? _____



Feedback

something
they liked



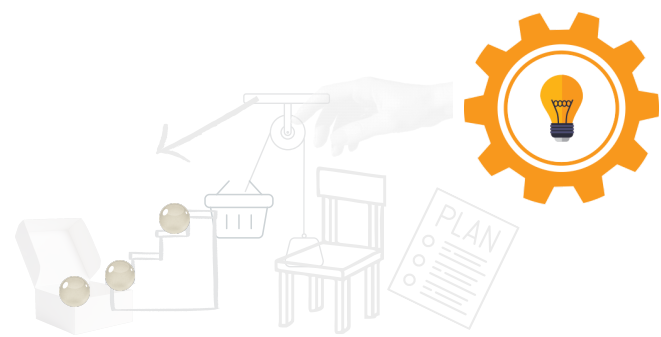
another thing
they liked



something
to improve



Think about what was learned from feedback and improve the ideas.



What changes were made after getting feedback?

Idea 1

Idea 2

What if...

What if...

Design – draw and communicate potential solutions



Draw your best idea in the box below. Use arrows to show parts that move, change or connect, and labels to show how your design works and what each part does. You can add words or short sentences to explain your thinking.

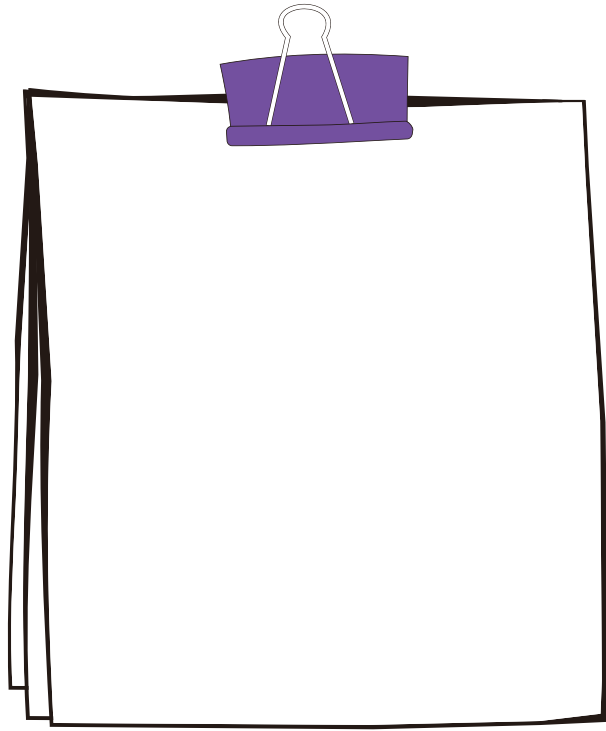
The chosen design



Thinking about the design



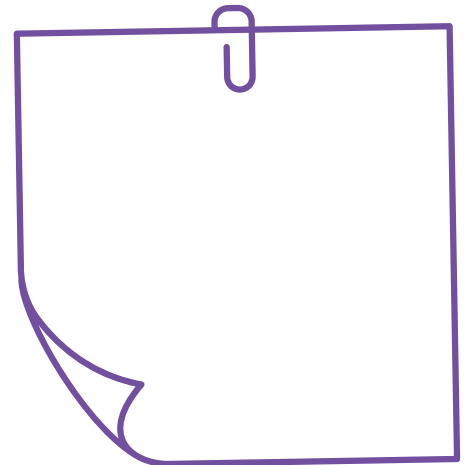
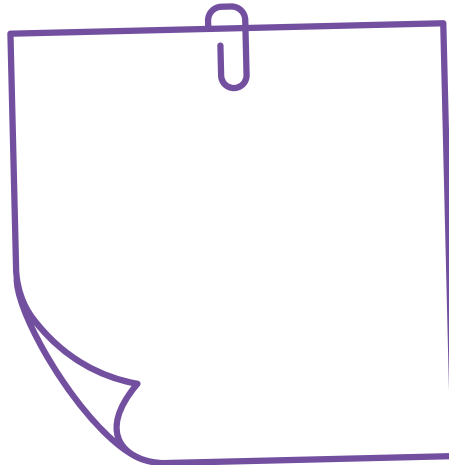
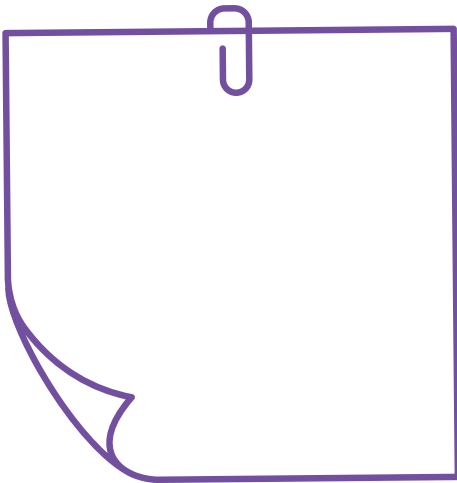
What is the design meant
to do and who is it for?



What could go wrong?

Why might it happen?

Can it be fixed?

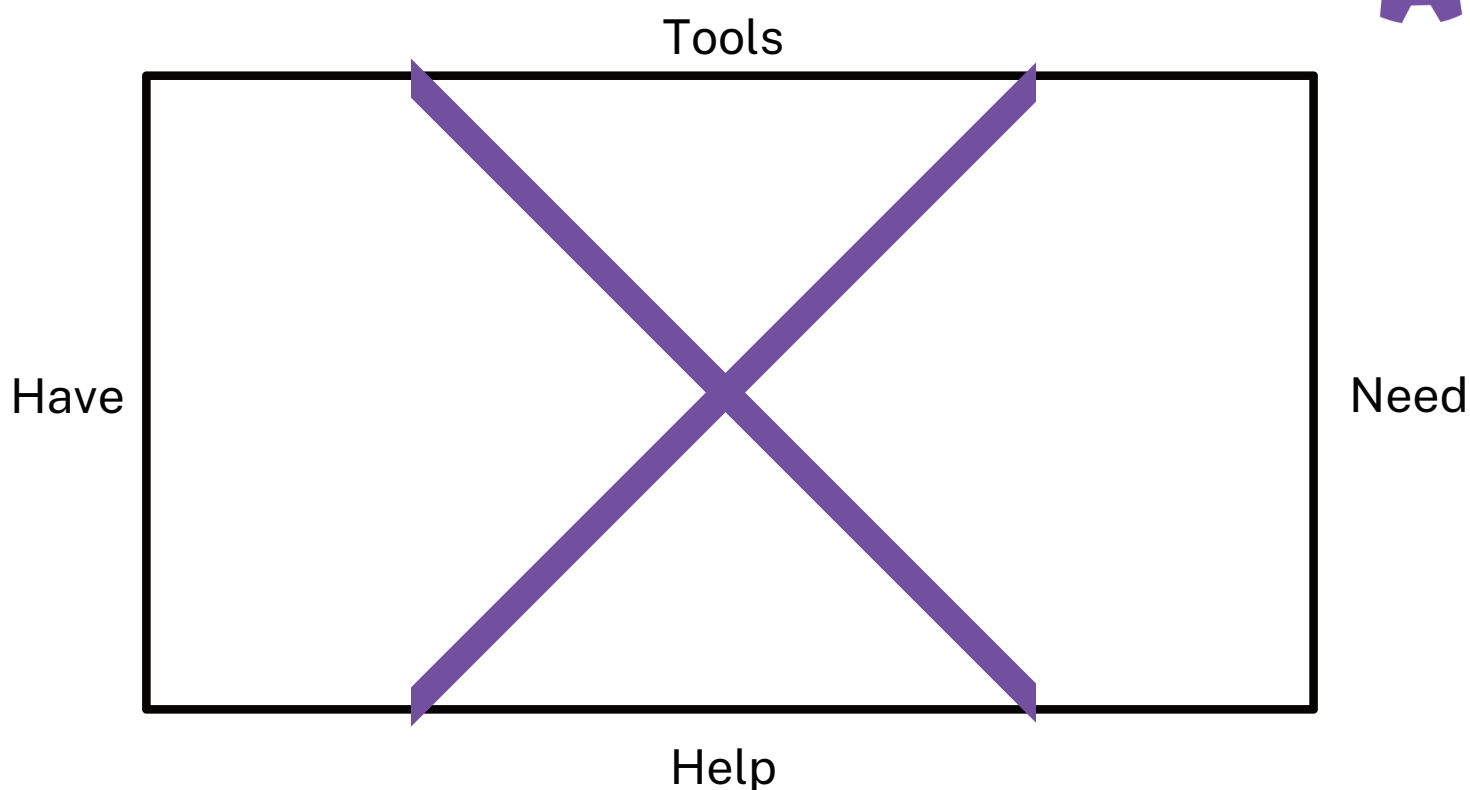


How the idea solves the problem

The solution works because _____



Think board – materials and tools



The building plan

Steps

Step 4
Step 3
Step 2
Step 1

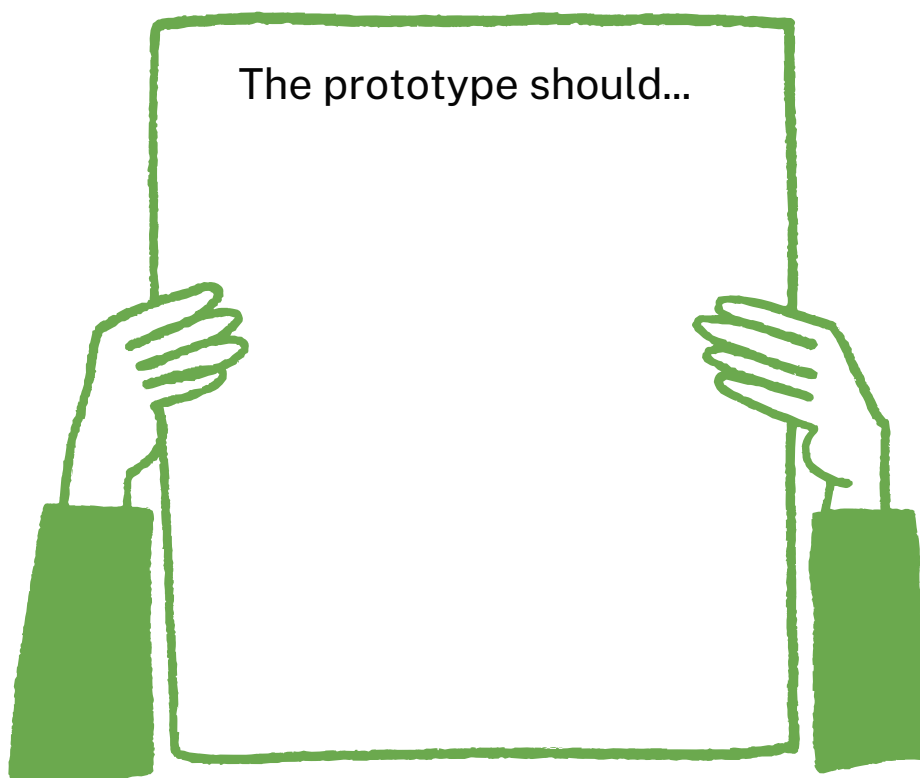
The design must

Building tips

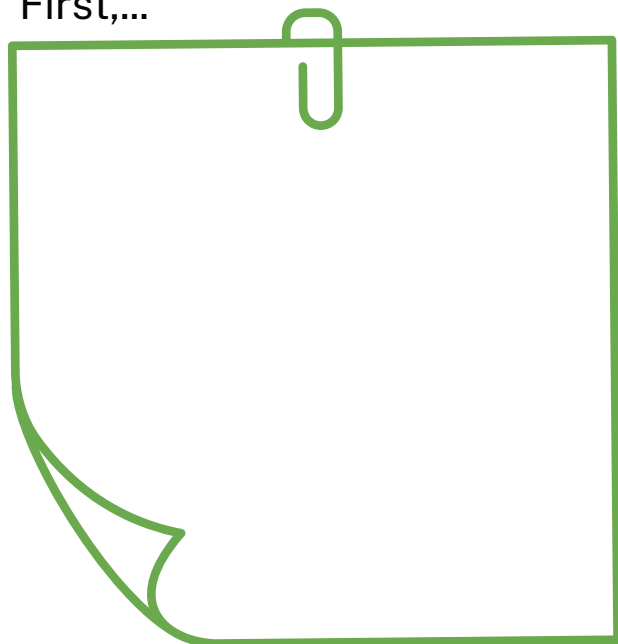


Prototype – produce a model or early version of possible solutions

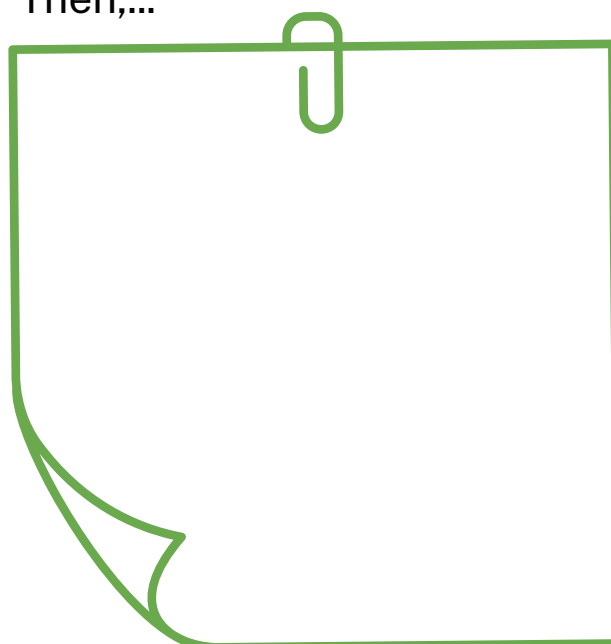
Before building, think carefully about what to make and how to make it



First,...



Then,...

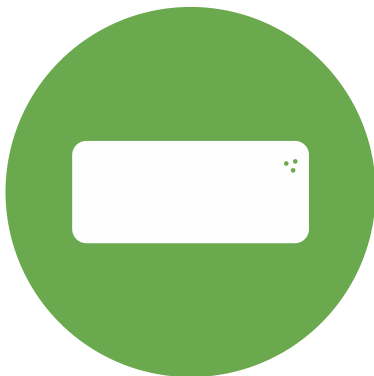


If something doesn't work? _____

Reflection



PMI-thinking about the prototype







Evaluate – test your design and share what you found

The thinking journey


Original idea was...




The design changed...



This part didn't work



Something important learned



The design met the challenge: How well did it work?



It worked really well.



It worked a bit.



It didn't work as planned.

Iterate – reflect and improve your solution



Use the traffic lights to help you think about what worked, what might need fixing and what you want to change in your design.

**What didn't
work and
needs to
change?**

A large, horizontal, red-outlined speech bubble with a white background, intended for writing reflections on what didn't work.

**What needs
more
testing?**

A large, horizontal, red-outlined speech bubble with a white background, intended for writing reflections on what needs more testing.

**What
worked
well?**

A large, horizontal, red-outlined speech bubble with a white background, intended for writing reflections on what worked well.

Before and after

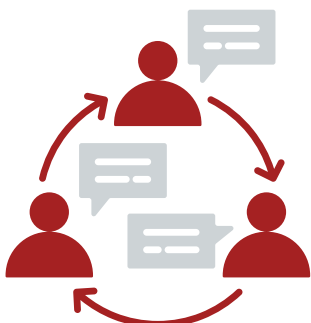


Draw, label and explain the changes that were made to improve the prototype.

Before



After



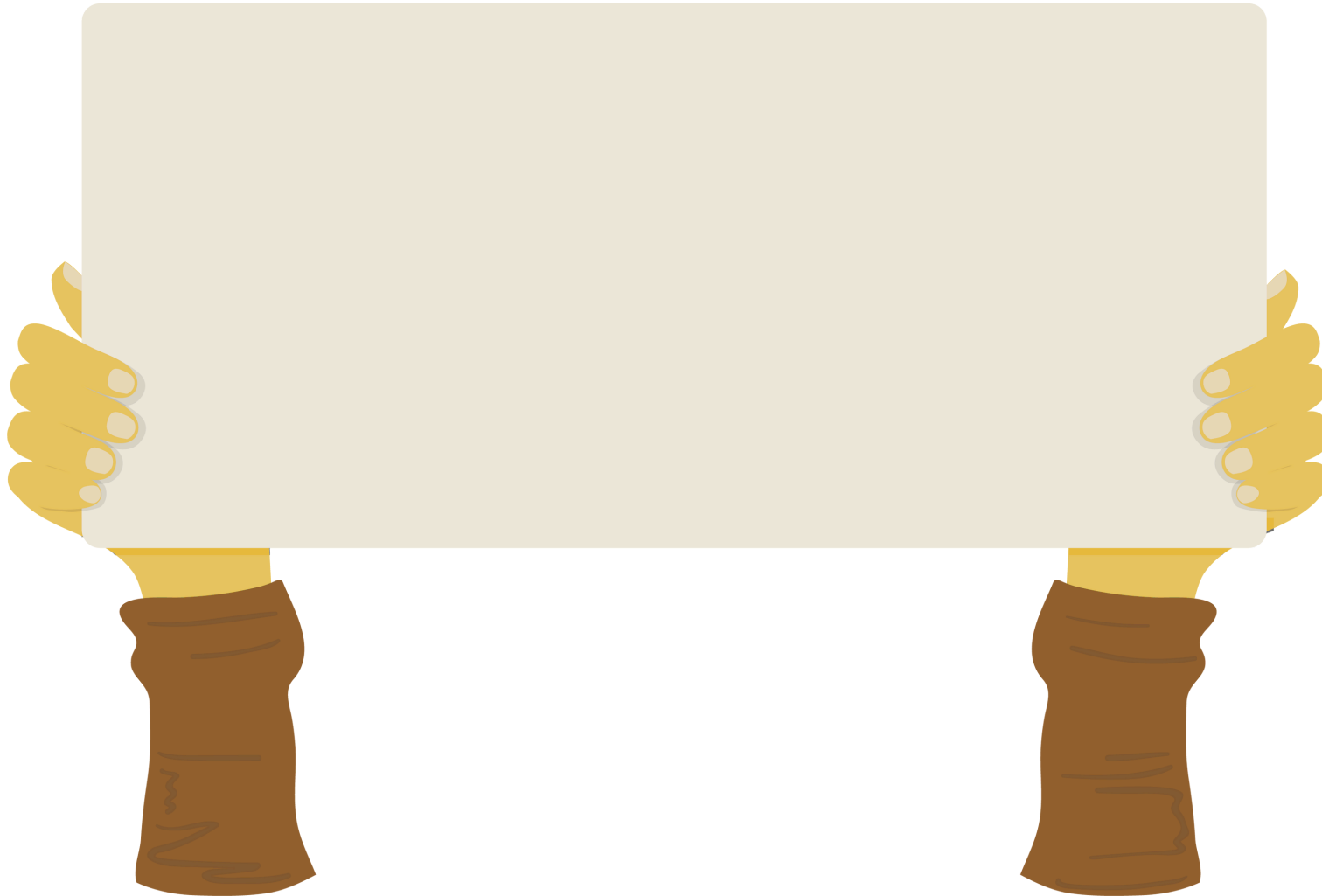
How did the change improve the design?

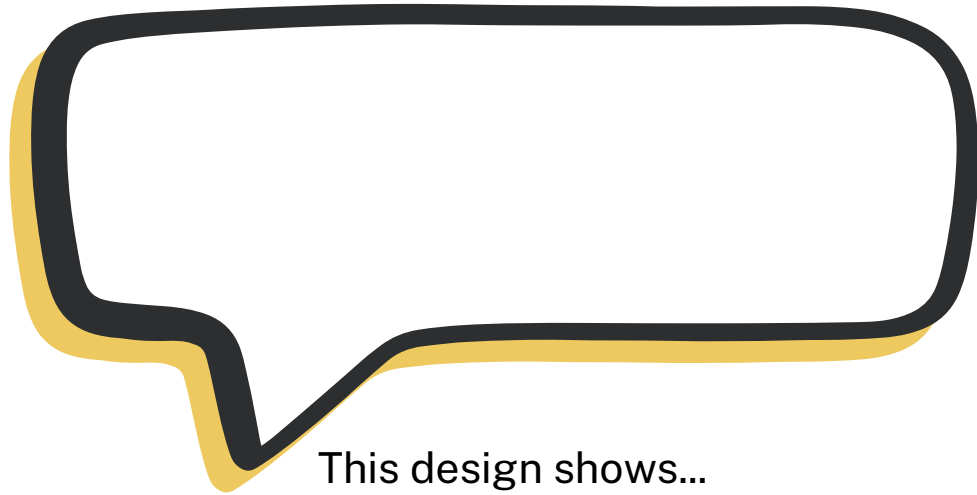
How does it answer the problem and provide a solution?

Communicate – share your ideas with others

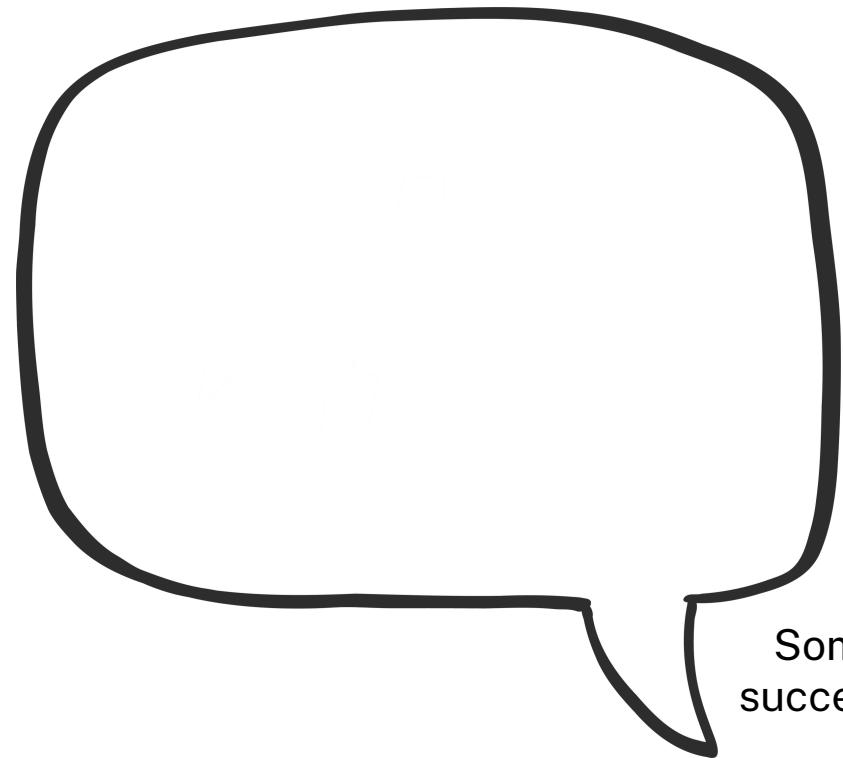


Create a poster to show the design to others. Draw, label and explain the design. Use colour, symbols and arrows to make the ideas clear. Think about: Who is the design for in real life? What was learned or improved? What makes the design a good solution to the problem? What could be done differently next time?





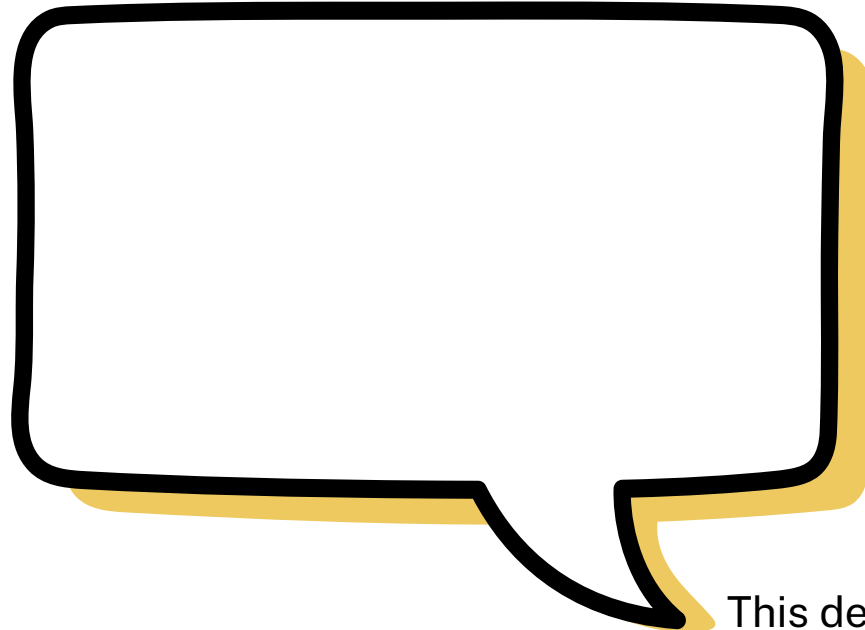
This design shows...



Something
successful is...



This design was chosen because...



This design is made to...