The Engineering Design Process

Imagination Station

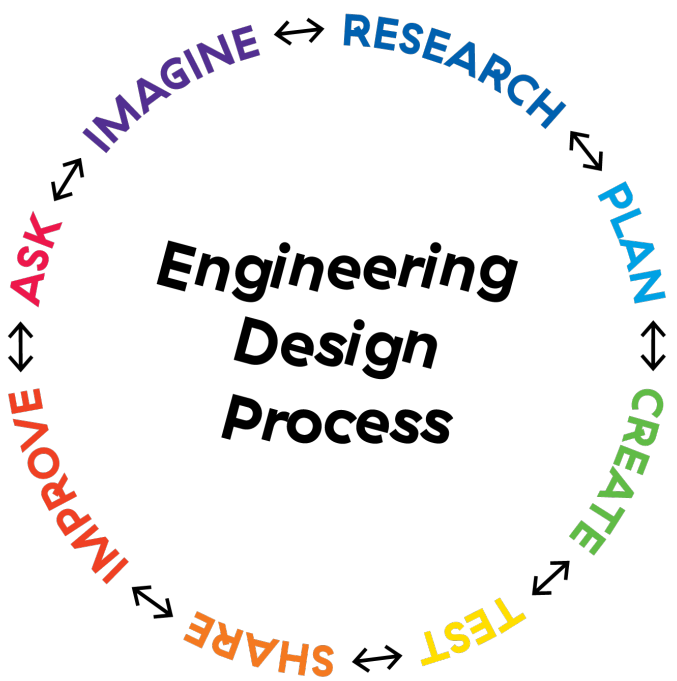
Kia ora explorers!

There are all sorts of problems that can be solved with a healthy dose of ingenuity and some engineering. It's much easier to come up with a useful solution if you follow a thorough design process.

Your task today is to follow good design processes to solve a problem affecting you or someone else important to you!

You will need a **design brief** to help state your problem clearly. Consider:

- What the problem is.
- Who the problem affects.
- Any special requirements those people may happen to have.
- How large the item you build needs to be.
- If you have a budget to work with.



Successful engineering requires a careful design process where you can move back and forward through the steps until you have created something that meets all the requirements of the design brief. There are eight steps we think are especially important to include.

On the following pages there are some questions to answer as you design and build an item to solve a problem in someone's life. We have added a few helpful suggestions along the way to help you make sure you meet the brief and engineer a totally amazing solution!

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ASK:

What is the main problem?

What else do we need to consider?

Add a few more details to complete your brief.

What other problems could arise?

IMAGINE:

How can we fix the problem?

Brainstorm as many different ways of fixing the problem as you can. Pick your favourite!

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RESEARCH:

How have others fixed the problem?

What are some similar things to my solution?

What materials can I use to fix the problem?

Make a list of all the items you have that you could use to build a terrific solution:

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PLAN:

What steps do I need to take to fix the problem?

Draw some diagrams to show what your solution will look like. Don't forget to add some labels to show important information that is difficult to draw.

What materials do I need?

You already made a list of possible materials. Circle or highlight the things you plan to actually use.

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CREATE:

Create your prototype **or** rebuild your prototype.

Take some photos of your solution(s)!

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TEST:

Check how successful your prototype is! Fill in what success will look like based on all the things in your design brief.

Success Criteria	**YES** or **NO**?	How can you turn the **NO** into a **YES**?

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SHARE:

Explain your solution to others.

Ask for suggestions.

Write down any feedback you get so you can use it to improve your design.

IMPROVE:

What can you change to better fix the problem?

What could be added?

What isn't needed?

Great work! Now go back and improve your solution!