SPACE TO DREAM

A design thinking challenge

Design a toy or a gadget for someone your age who is moving to Mars.

COMMISSIONER'S DIGITAL CHALLENGE

Commissioner for Children & Young People

COMMISSIONER'S DIGITAL CHALLENGE

UNDERSTAND AND CARE

COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

Meet an astronaut

Watch this video from former NASA astronaut Pamela Melroy to learn about what it's really like to be in outer-space:

https://commissionersdigitalchallenge.net.au/design-thinking/schools/schools-design-thinking-process/#understand

COMMISSIONER'S DIGITAL CHALLENGE

Meet an astronaut

What did we learn from Pamela Melroy about what it's like to be in space?

Understand and care

- Make a plan
- Have lots of ideas – choose the best
- Make it!
- Can you improve it?

There's less gravity. This can be fun. It can mean a ball bounces much higher. What else could it mean?

COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

Meet an astronaut

What did we learn from Pamela Melroy about what it's like to be in space?

It can get super cold.

Humans can't breathe Martian air.

To do things outside, you need a space suit and big gloves.

COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

Meet an astronaut

What did we learn from Pamela Melroy about what it's like to be in space?

There's not a lot of room on the spacecraft.

There's no room to take pets.

Different kinds of robots can help humans in space.

COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

Meet an astronaut

What did we learn from Pamela Melroy about what it's like to be in space?

You might not be able to take your family.

Reminders of family and friends back on Earth are important.

The best way to communicate with those on Earth is by video.

COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

Meet an astronaut

What did we learn from Pamela Melroy about what it's like to be in space?

It's important to take a break and find time to play on the spacecraft.

Taking beautiful pictures of Earth from space is nice to do.

COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

Meet an astronaut

What did we learn from Pamela Melroy about what it's like to be in space?

There's no store around the corner where you can replace or repair the things you brought.

You really need to think it through before you take it to space!

COMMISSIONER'S DIGITAL CHALLENGE

Meet an astronaut

ACTIVITY:

Empathy Map

Understand and care

- Make a plan
- Have lots of ideas – choose the best
- Make it!
- Can you improve it?

COMMISSIONER'S DIGITAL CHALLENGE

A free design thinking challenge for children in South Australia. Learn more at: **CommissionersDigitalChallenge.net.au**

EMPATHY MAP

Use this map to write down what you notice about Pamela Melroy's video.

This will help you to understand and care about what it might be like to live in space.

What does she **say?**	What does she **think?**
What does she **do?**	How does she **feel?**

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COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

Life on Earth.

Life on Mars.

How do they compare?

Understand and care

- Make a plan
- Have lots of ideas – choose the best
- Make it!
- Can you improve it?

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

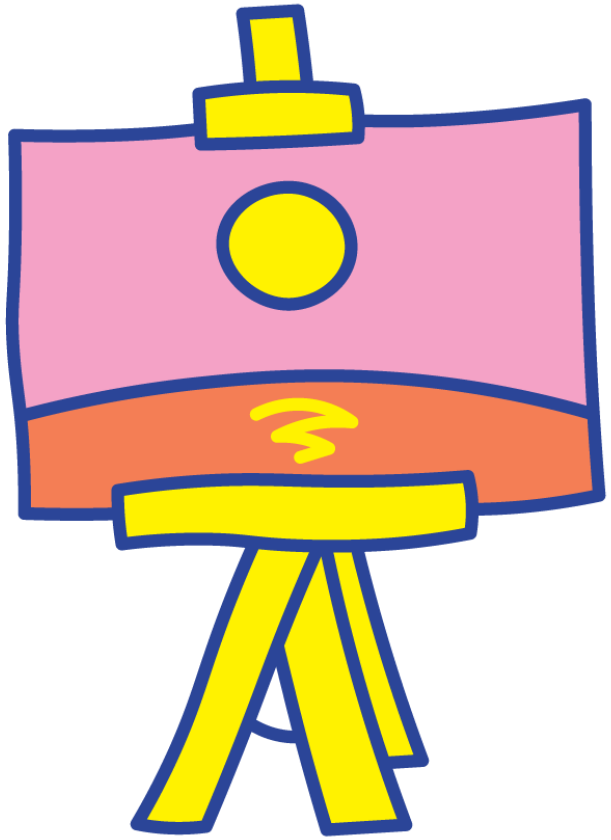
Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?



Skies are pink and sunsets are blue

The opposite of skies on Earth

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

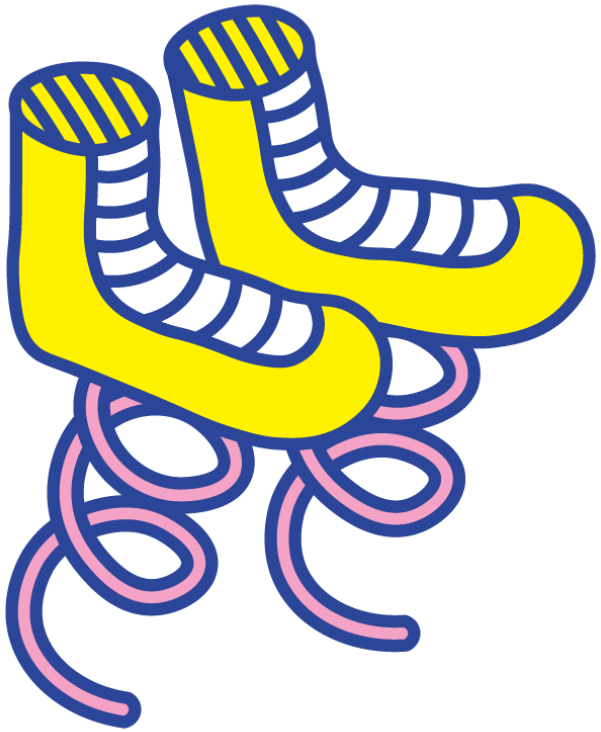
Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?



You can jump twice as high

And stay up in the sky for 2 seconds

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

One year = 687 days

When would you celebrate your birthday?

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

It's expensive to take things there

It costs anywhere from thousands to millions of dollars just to take 1 kilogram of stuff up there

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

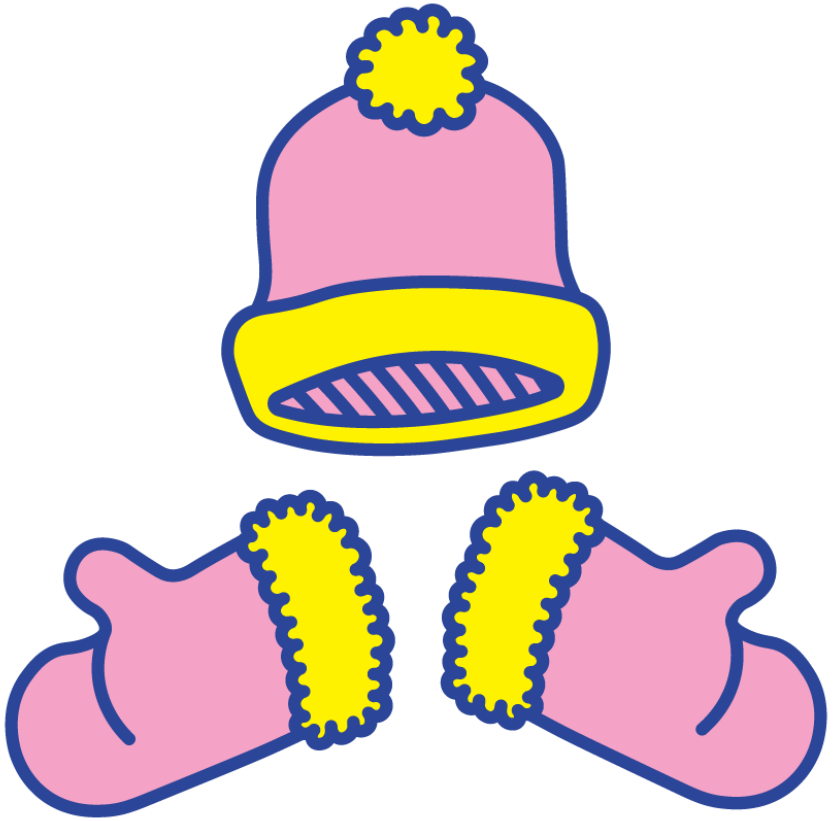
Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?



It can get very cold

Parts of Mars get down as low as minus 125 degrees C

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

The soil is red

And contains toxic chemicals

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

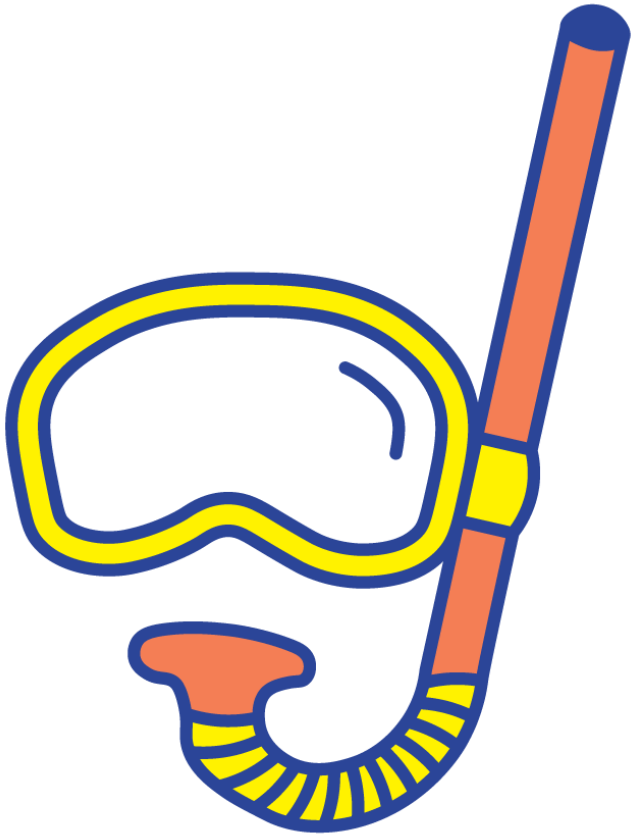
Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?



There is no air

95% carbon dioxide and no oxygen in the atmosphere

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

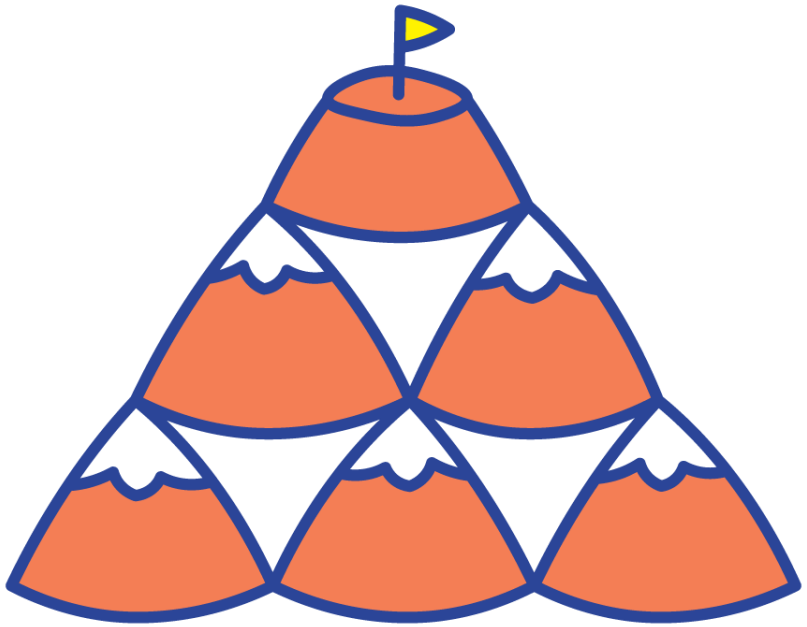
Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?



It has the highest mountain in our Solar System

Olympus Mons is 2.5 times higher than Mount Everest

COMMISSIONER'S DIGITAL CHALLENGE

Mars Exploration

ACTIVITY:

Compare and Contrast

Understand and care

- Make a plan
- Have lots of ideas – choose the best
- Make it!
- Can you improve it?

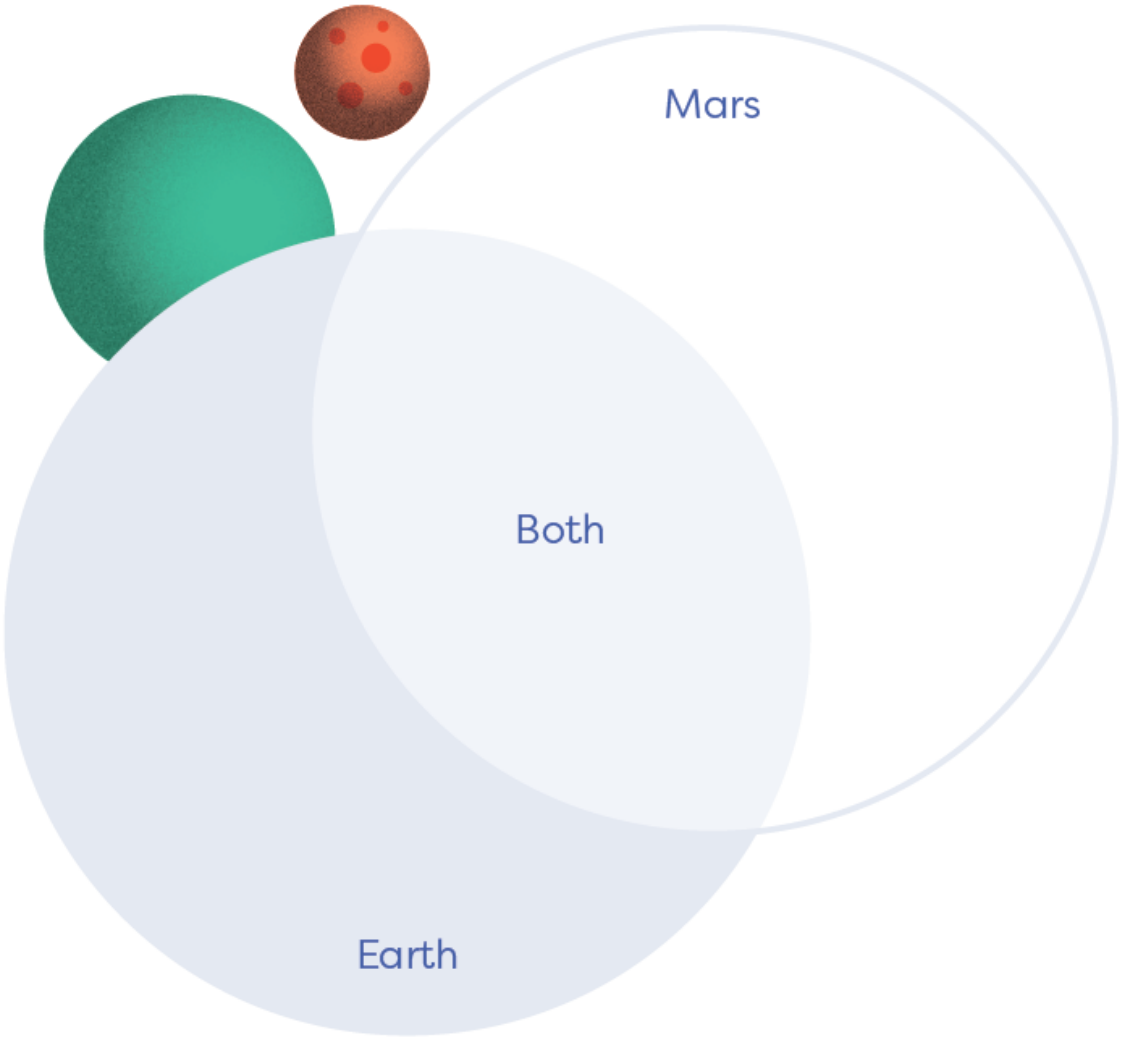
COMMISSIONER'S DIGITAL CHALLENGE

A free design thinking challenge for children in South Australia. Learn more at: **CommissionersDigitalChallenge.net.au**

COMPARE AND CONTRAST

Living on Earth. Living on Mars. What will be the same? What will be different?

Use this chart to write down your ideas.



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COMMISSIONER'S DIGITAL CHALLENGE

MAKE A PLAN

COMMISSIONER'S DIGITAL CHALLENGE

Make a plan

How old is the person?
Who is in their family?
What pets do they have?
What hobbies do they have?
What language/s do they speak?
What do they like to do after school?
What do they like to do with their friends?
What skills do they have?
What would they like to get better at?
What do they like to eat?
What sports do they play?
How do they help others at home or school?
What will they miss most about their life on Earth?
Do they have a part-time job or chores they have to do?
What books, movies, music, games do they like?

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

COMMISSIONER'S DIGITAL CHALLENGE

Make a plan

An example of a ‘user need’ statement:

A **ten-year old who loves dogs** needs a **playful companion** because they **like having fun with their pet.**

TIP: Try not to decide what you are actually going to invent just yet!

Make a plan

An example of a ‘How Might I?’ statement:

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

How might I provide a playful companion for a ten-year old **living on Mars?**

TIP: Try not to decide what you are actually going to invent just yet!

COMMISSIONER'S DIGITAL CHALLENGE

Make a plan

ACTIVITY:

Problem Profile

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

COMMISSIONER'S DIGITAL CHALLENGE

A free design thinking challenge for children in South Australia. Learn more at: **CommissionersDigitalChallenge.net.au**

PROBLEM PROFILE

You will be designing a toy or gadget for a child the same age as you who is moving to Mars.

This child is a fictional person and you can use your imagination to decide what kind of person they are.

Draw your person in the space between the circles and then use the circles to describe the person. What do they like to do? What are their favourite sports or hobbies? What kinds of jobs or chores do they do?

Write your User Need Statement here

..... needs to .....

because .....

Write your 'How Might I' question here

How might I ..... ?

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COMMISSIONER'S DIGITAL CHALLENGE

HAVE LOTS OF IDEAS – CHOOSE THE BEST

Have lots of ideas

Understand and care

Make a plan

Have lots of ideas – choose the best

Make it!

Can you improve it?

What is your craziest idea?

How could you adapt something you have seen before?

What if you had lots of money to make your invention?

What if you didn't have any money?

What is your most obvious idea?

What is your funniest or silliest idea?

COMMISSIONER'S DIGITAL CHALLENGE

Have lots of ideas

ACTIVITY:

Mind Map

Understand and care

Make a plan

Have lots of ideas – choose the best

Make it!

Can you improve it?

COMMISSIONER'S DIGITAL CHALLENGE

A free design thinking challenge for children in South Australia. Learn more at: **CommissionersDigitalChallenge.net.au**

MIND MAP

Write your 'How Might I' question in the middle.

Use this mind map to come up with as many ideas for your invention as you can.

How might I

.....

.....

.....

.....

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COMMISSIONER'S DIGITAL CHALLENGE

Have lots of ideas – choose the best

Understand and care

Make a plan

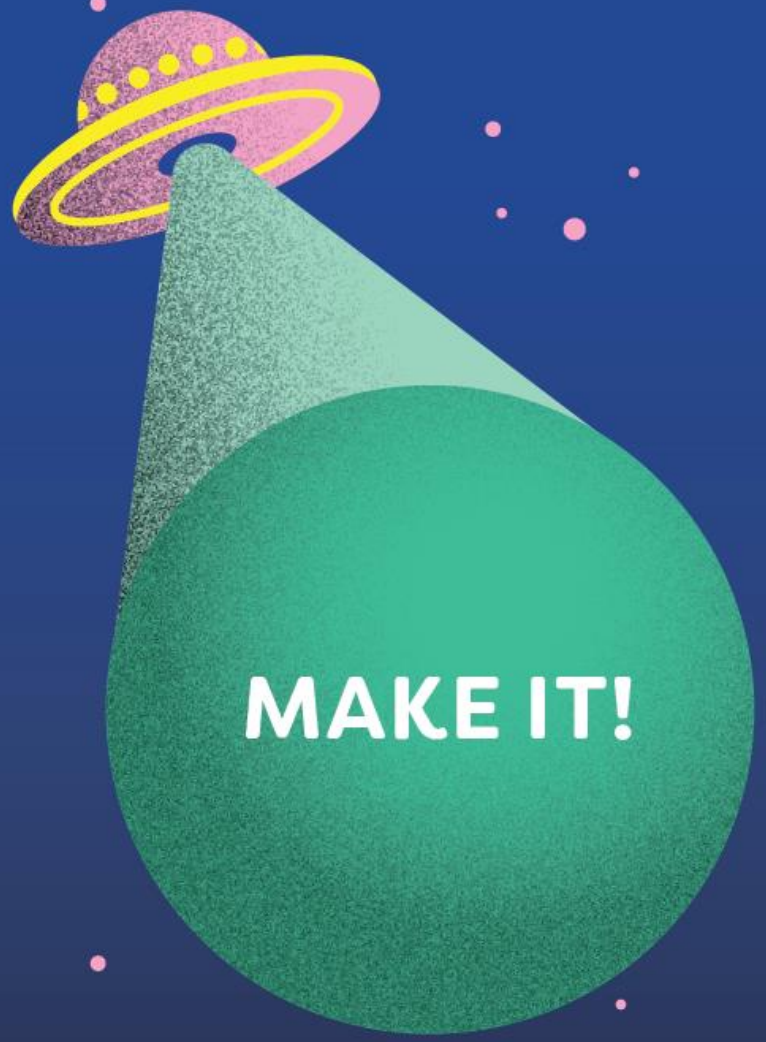
Have lots of ideas – choose the best

Make it!

Can you improve it?

Highlight the top 3 ideas on your mind map

1. The idea that will probably work
2. The idea that is so crazy it might just work
3. The idea that you feel most excited about inventing



COMMISSIONER'S DIGITAL CHALLENGE

Make it!

When an inventor has a good idea, they make a **prototype**.

A prototype is a model or drawing of their invention which is good enough to test out on others.

A prototype isn't completely finished, but close enough for other people to understand how it will work.

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

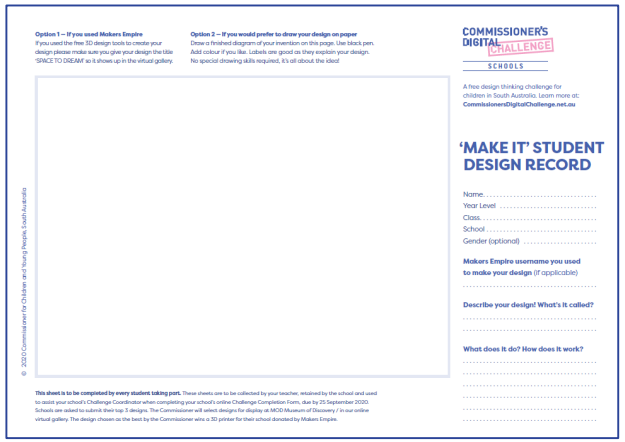
Can you improve it?

Make it!

Decide how you will make your ‘prototype’:

Option 1:
Build your design with free 3D modelling tools from Makers Empire, name your design SPACE TO DREAM and record your Makers Empire username on your **‘MAKE IT!’ Student Design Record**.

Option 2:
Hand-draw a diagram / picture with black pen onto the **‘MAKE IT!’ Student Design Record**



Option 1 – If you used Makers Empire
If you used the free 3D design tools to create your design please make sure you give your design the title ‘SPACE TO DREAM’ so it shows up in the virtual gallery.

Option 2 – If you would prefer to draw your design on paper
Draw a finished diagram of your invention on this page. Use black pen. Add colour if you like. Labels are good as they explain your design. No special drawing skills required, it’s all about the idea!

COMMISSIONER’S DIGITAL CHALLENGE SCHOOLS

A free design thinking challenge for children in South Australia. Learn more at: **CommissionersDigitalChallenge.net.au**

‘MAKE IT’ STUDENT DESIGN RECORD

Name.....
Year Level .....
Class.....
School .....
Gender (optional) .....

Makers Empire username you used to make your design (if applicable)

Describe your design! What’s it called?

What does it do? How does it work?

This sheet is to be completed by every student taking part. These sheets are to be collected by your teacher, retained by the school and used to assist your school’s Challenge Coordinator when completing your school’s online Challenge Completion Form, due by 25 September 2020. Schools are asked to submit their top 3 designs. The Commissioner will select designs for display at MOD Museum of Discovery / in our online virtual gallery. The design chosen as the best by the Commissioner wins a 3D printer for their school donated by Makers Empire.

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Whichever option you choose, you will record your design using your **‘MAKE IT!’ Student Design Record**. You will provide this completed sheet to your teacher when you complete the Challenge.

COMMISSIONER’S DIGITAL CHALLENGE

Make it!

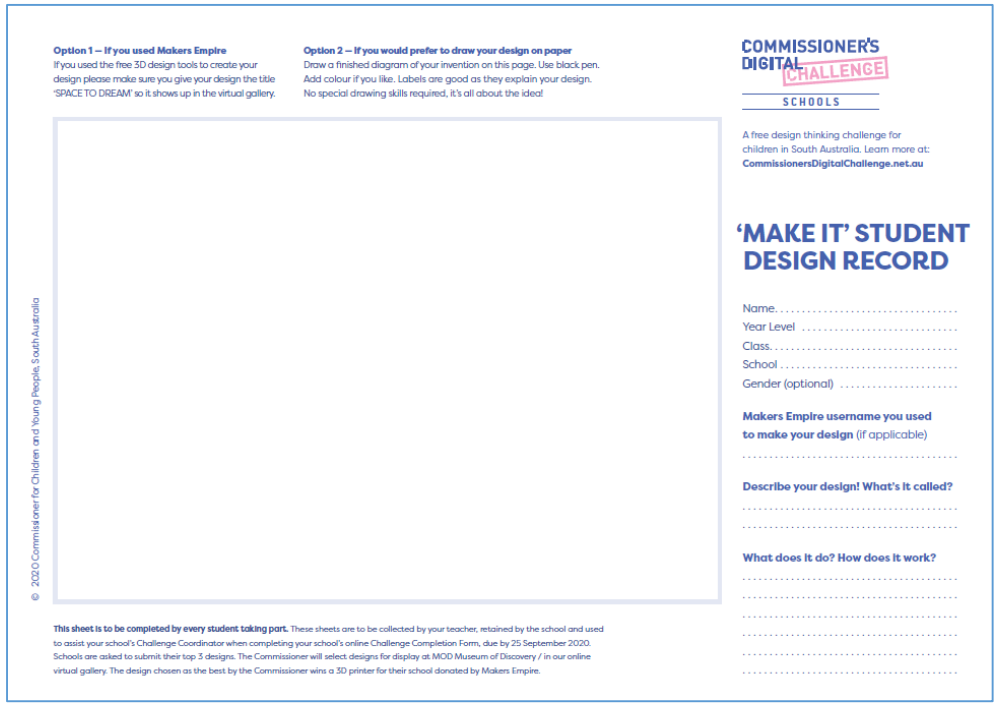
Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?



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COMMISSIONER'S DIGITAL CHALLENGE
SCHOOLS

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'MAKE IT' STUDENT DESIGN RECORD

Name. .....
Year Level .....
Class. .....
School .....
Gender (optional) .....

Makers Empire username you used to make your design (if applicable)
.....

Describe your design! What's it called?
.....
.....

What does it do? How does it work?
.....
.....
.....
.....
.....
.....

This sheet is to be completed by every student taking part. These sheets are to be collected by your teacher, retained by the school and used to assist your school's Challenge Coordinator when completing your school's online Challenge Completion Form, due by 25 September 2020. Schools are asked to submit their top 3 designs. The Commissioner will select designs for display at MOD Museum of Discovery / in our online virtual gallery. The design chosen as the best by the Commissioner wins a 3D printer for their school donated by Makers Empire.

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COMMISSIONER'S DIGITAL CHALLENGE

ACTIVITY:

'MAKE IT!' Student Design Record

- Each student needs a printed **'MAKE IT! Student Design Record.**
- Every student will hand their completed **'MAKE IT!' Student Design Record** to the teacher at the end of the Challenge.
- Students may wish to revise their **'MAKE IT!' Student Design Record** after completing the next activity.

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

OPTION 1
Build your design with free 3D modelling tools from Makers Empire

1. Download the free version of Makers Empire at
https://www.makersempire.com/download/

2. Sign up to Makers Empire or login if you already have an account.

- *Think of a username - do not use any information that could identify you.*
- *Think of a password - do not use anything someone could easily guess.*

3.Write down your Makers Empire Username on your **"MAKE IT!' Student Design Record**.

3. Once you are logged in, select the 'Shaper' tool.

4. Create your design in 3D - use the Pro tips to get the best result!

5. Click 'Finish' and give your design the title 'SPACE TO DREAM'. This is very important as this is how the Commissioner will be able to view your design.

COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

OPTION 2:
Draw your design using the ‘MAKE IT!’ Student Design Record

1. Use the **‘MAKE IT!’ Student Design Record** to draw your idea with black pen.

Option 1 – If you used Makers Empire
If you used the free 3D design tools to create your design please make sure you give your design the title ‘SPACE TO DREAM’ so it shows up in the virtual gallery.

Option 2 – If you would prefer to draw your design on paper
Draw a finished diagram of your invention on this page. Use black pen. Add colour if you like. Labels are good as they explain your design. No special drawing skills required, it’s all about the idea!

COMMISSIONER’S DIGITAL CHALLENGE
SCHOOLS

A free design thinking challenge for children in South Australia. Learn more at: **CommissionersDigitalChallenge.net.au**

‘MAKE IT’ STUDENT DESIGN RECORD

Name .....
Year Level .....
Class .....
School .....
Gender (optional) .....

Makers Empire username you used to make your design (if applicable)

Describe your design! What’s it called?

What does it do? How does it work?

This sheet is to be completed by every student taking part. These sheets are to be collected by your teacher, retained by the school and used to assist your school’s Challenger Coordinator when completing your school’s online Challenger Completion Form, due by 25 September 2020. Schools are asked to submit their top 3 designs. The Commissioner will select designs for display at MOD Museum of Discovery / in our online virtual gallery. The design chosen as the best by the Commissioner wins a 3D printer for their school donated by Makers Empire.

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2. You can colour your drawing if you like.

3. Make sure to give your invention a name and describe how it works.

4. You may wish to include labels in your drawing to help explain how it works.

COMMISSIONER’S DIGITAL CHALLENGE

CAN YOU MAKE IT BETTER?

COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

All good inventors test their inventions out and get feedback to help make them even better.

COMMISSIONER'S DIGITAL CHALLENGE

Can you make it better?

ACTIVITY:

Two Wishes and a Star

Understand and care

Make a plan

Have lots of ideas – choose the best

Make it!

Can you improve it?

COMMISSIONER'S DIGITAL CHALLENGE

A free design thinking challenge for children in South Australia. Learn more at: **CommissionersDigitalChallenge.net.au**

TWO WISHES AND A STAR

Use this sheet to collect feedback from 3 other students.

A star is something that is good about your design.

A wish is something that could make it even better.

Feedback from...	Feedback from...	Feedback from...
Star	Star	Star
Wish	Wish	Wish
Wish	Wish	Wish

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COMMISSIONER'S DIGITAL CHALLENGE

Understand and care

Make a plan

Have lots of ideas
– choose the best

Make it!

Can you improve it?

Inventors think about the feedback they have received and decide what changes they want to make to their designs. These changes are called iterations.

If you used Makers Empire - you can go back and edit your design via the 'My Designs' tab on the Makers Empire software.

If you drew your design - you may wish to complete a new **'MAKE IT! Student Design Record** if you decide to make a lot of changes, or big changes.

COMMISSIONER'S DIGITAL CHALLENGE

HOW TO SUBMIT DESIGNS TO THE COMMISSIONER

Teachers collect a ‘MAKE IT!’ Student Design Record from all students who completed the Challenge.

Teachers hand all completed ‘MAKE IT!’ Student Design Records to your school’s Challenge Coordinator.

Your school will choose the best three designs by students at your school

Your school's Challenge Coordinator will submit your school's top 3 designs using the Challenge Completion Form before the closing date of Friday 25 September 2020.

MOD.

Entries will be judged by the Commissioner and winning designs will feature in a public exhibition at MOD (Museum of Discovery).

The school that submits the Commissioner's favourite design will win a 3D printer donated by Makers Empire.

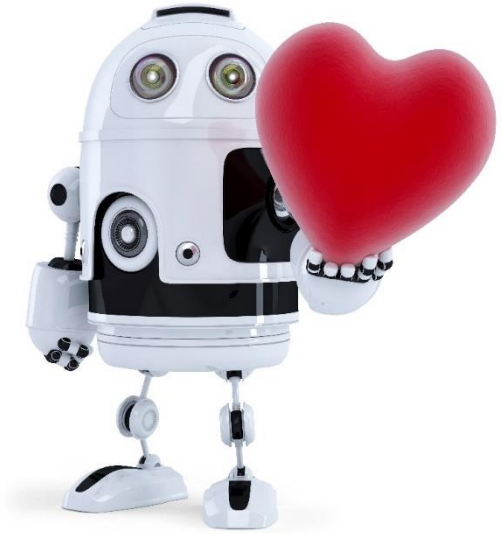
There will also be an online gallery of featured designs on the Challenge website.

Congratulations!

You have completed Space to Dream.

Hand your completed **'MAKE IT!' Student Design Record** to your teacher.

* Teachers will provide all completed **'MAKE IT!' Student Design Records** to their school's Challenge Coordinator.



Your teacher will award you with your Space to Dream **Certificate of Achievement** from the Commissioner after the Challenge closes at the end of Term 3.