

Name: _____

ENGINEERING DESIGN FOLIO



The Australian Virtual Astronaut Challenge
Week 2





Define & Brainstorm

What is Ideation?

Ideation is the process where you generate ideas and solutions through activities such as sketching, prototyping, brainwriting, and a wealth of other ideation techniques.

The aim is to generate a large quantity of ideas that the team can then filter and cut down into the best, most practical or most innovative ones in order to inspire new and better design solutions and products.

Ideas Blitz - Dr Ken Hudson developed the ideation tools of speed thinking and ideas blitz. Students will complete an Ideas Blitz to rapidly come up with solutions for their experiment, device or environment.



STEP 1: START

Every individual working by themselves aims to create 9 initial thoughts, ideas or solutions in 2 minutes (capture in the inner circles). Creating quickly will stop you filtering your ideas and to get started.

STEP 2: ENHANCE

The next step is to build on the initial ideas. The aim is to build, expand or improve on all of these ideas. Think 'Yes And' not 'Yes But' (capture in the outer bubbles).

STEP 3: CONNECT

Try and combine different thoughts to create a bigger idea or solution (either through logic or random pairing).

STEP 4: EVALUATE

Select a criteria and quickly evaluate each idea (and connected ones). The criteria should flow from the challenge (score from 1 to 10).

If you are working in a bigger group have each pairing or smaller group present their best ideas to each other. Aim to build an even better idea or solution.

STEP 5: ACTION

Take the best idea(s) and develop a 9 point action plan.

What is an Ideas Blitz?

A Blitz is a short, fast, semi-structured creativity and productivity tool you and/or a group can use everyday.

Ideas Blitz can help you and others become more energised, confident and stop procrastinating.

How to run an Ideas Blitz (5 steps)

These are suggestions only. Based on our experience the Start stage is the only fixed one. You may do 1 or all 5 steps depending on the challenge.

The Challenge

The specific problem, opportunity, issue or decision to be Blitzed.

When can you Blitz?

An Ideas Blitz can be used for any problem, opportunity, issue, or decision. In fact, any time you feel stuck and/or want a new set of ideas, solutions or options – fast! It can be used by yourself, with a partner or as part of any group or brainstorming process.

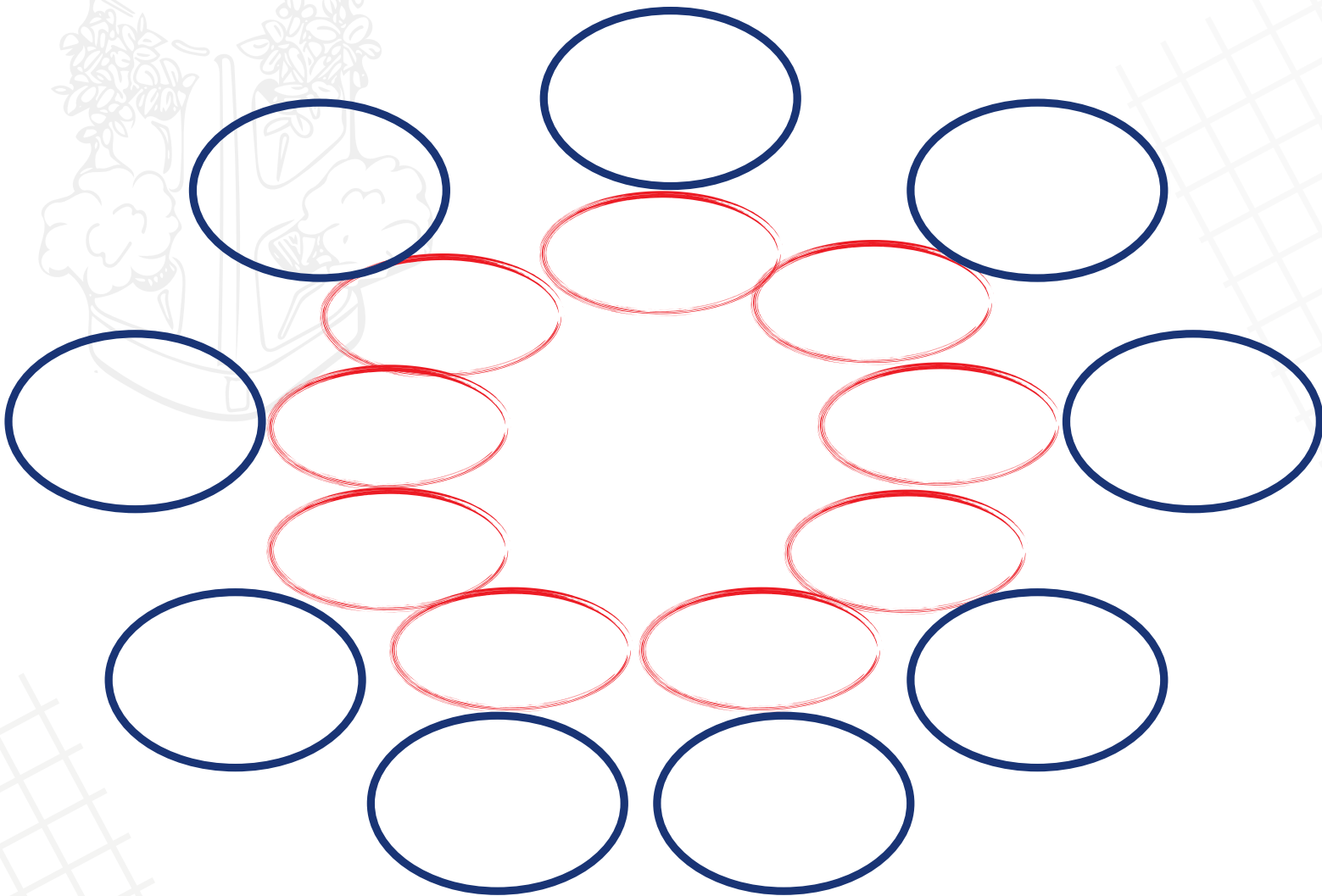




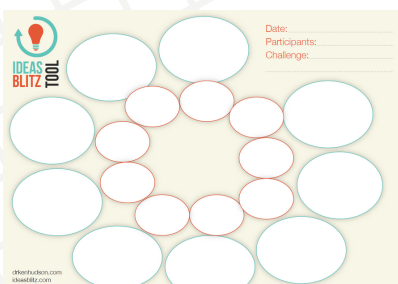
Define & Brainstorm

Activity

1. **Start** - Every individual working by themselves aims to create 9 initial thoughts, ideas or solutions in 2 minutes (capture in the inner red circles). Creating quickly will stop you filtering your ideas and to get started.



2. **Enhance** - The next step is to build on the initial ideas. The aim is to build, expand or improve on all of these ideas. Think 'Yes And' not 'Yes But' (capture in the outer bubbles).



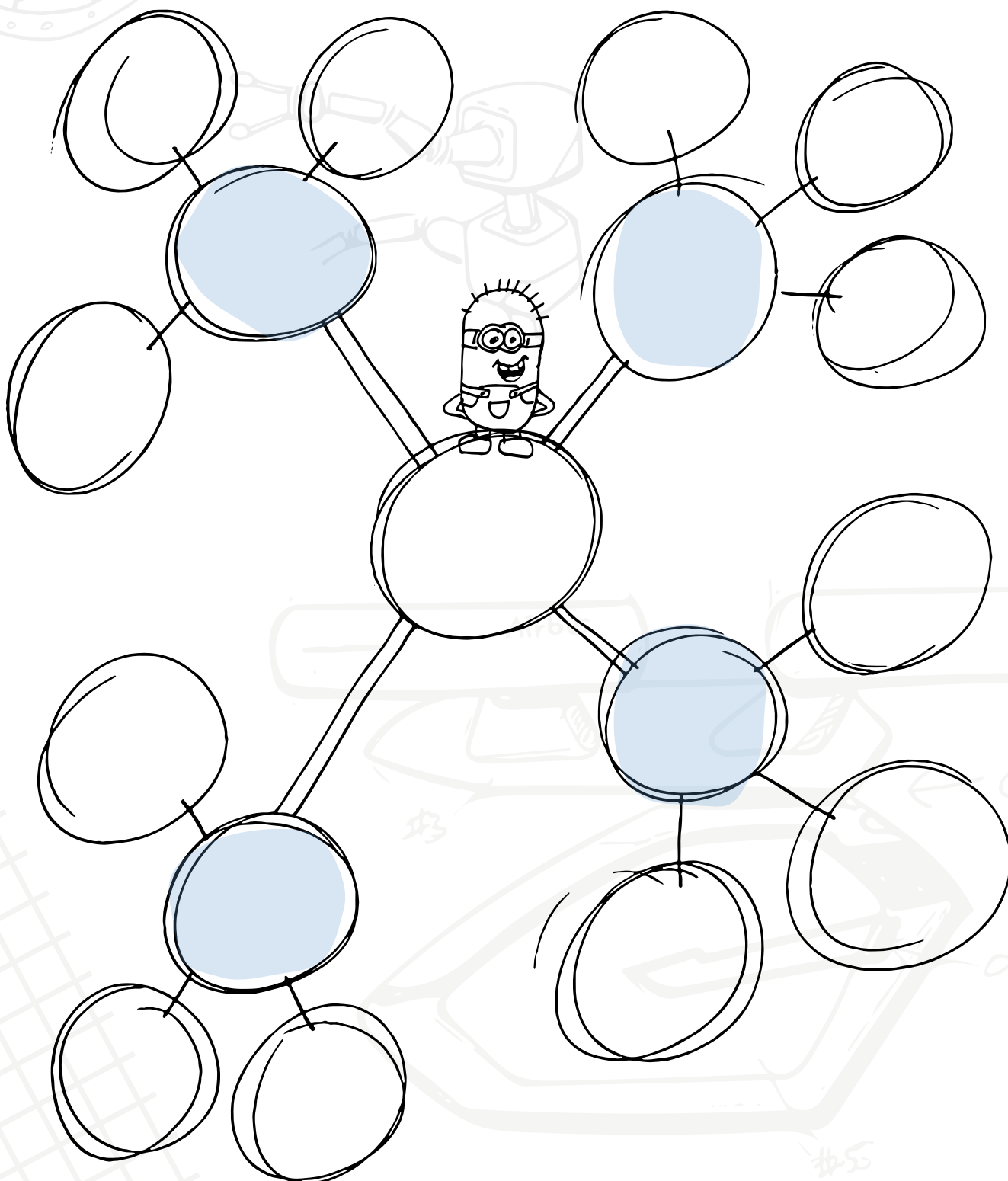
If you wish download the original 'Blitz Tool' courtesy of Dr Ken Hudson. <http://ideasblitz.com/>





Define & Brainstorm

Step 3: Connect Try and combine different thoughts to create a bigger idea or solution (either through logic or random pairing). Use the mind map below to capture your ideas and connections.





Evaluate

4. Evaluate - Transfer your big ideas into the boxes below. Select a criteria and quickly evaluate each idea. (Score from 1 to 10). If you are working in a bigger group have each pairing or smaller group present their best ideas to each other. Aim to build an even better idea or solution.

1.

2.

3.

4.

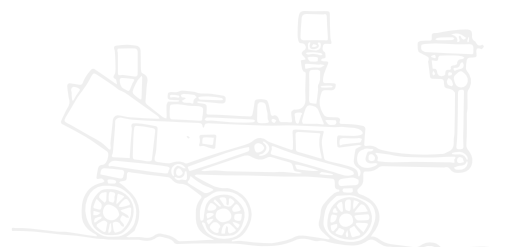
5.

6.

7.

8.

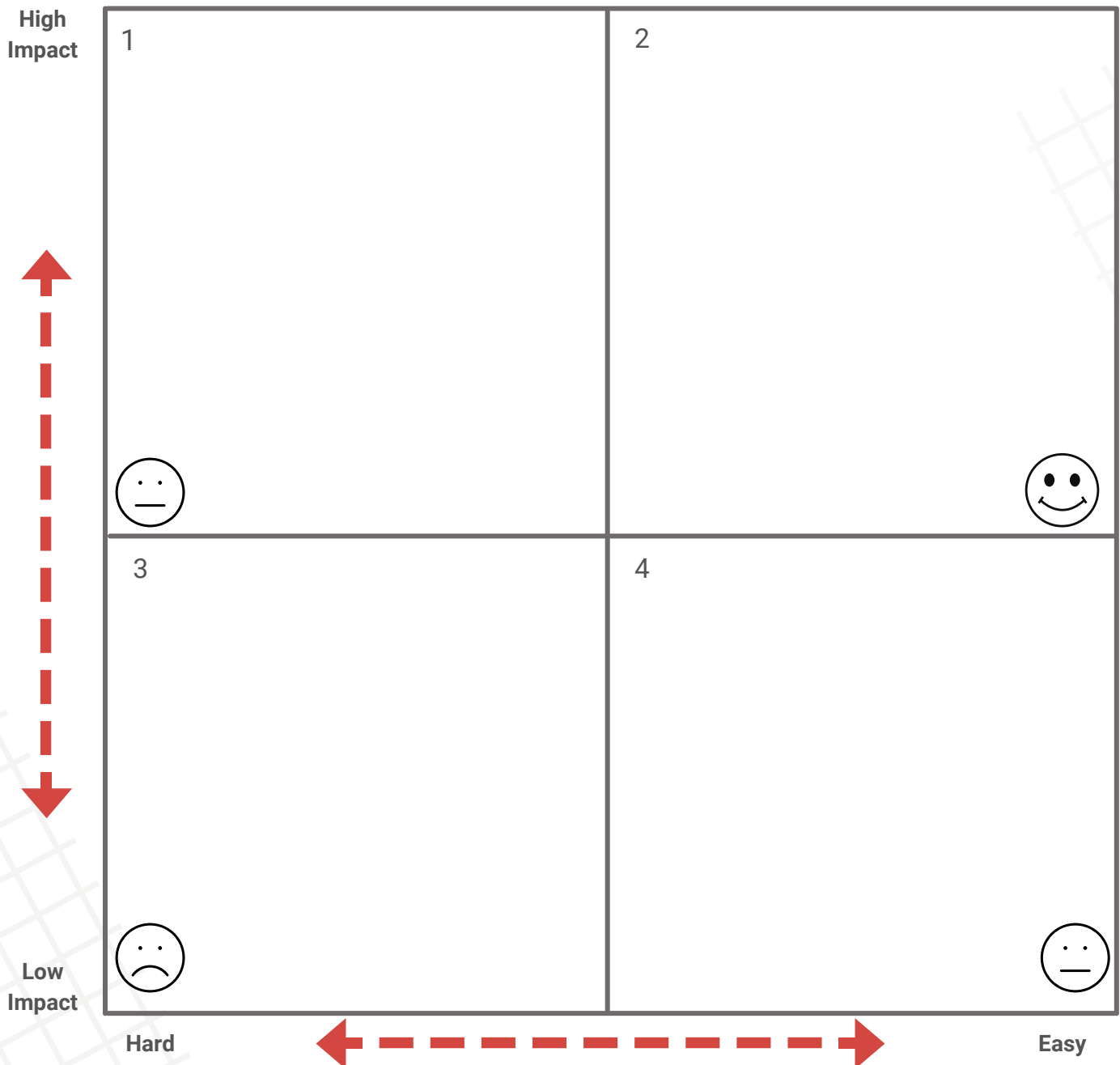
9.





Evaluate

4. Evaluate - Now evaluate your ideas further using the impact/effort matrix below. Add all your ideas and connections into one of the four segments.



What is an Impact Effort Matrix?

An impact effort matrix is a decision-making tool that assists people to manage their time more efficiently. Each potential idea, strategy or project is assessed based on the level of effort required and the potential impact or benefits they will have.

Each team member will evaluate their ideas in 60 seconds



Define

Clearly define the problem and identify potential mission solutions

Define the problem and ideate together

Now in your groups, use the results from your Design Blitz from the previous pages. Are there any solutions that are the same? Is there one that stands out? Can you combine any? Use the graphic organiser below (or redraw on large paper) to define the problem your group wishes to solve, select three possible mission solutions, evaluate these potential solutions and then select a mission that you want to develop further.

Problem:

Mission solution 1:

Mission solution 2:

Mission solution 3:

Pros

Cons

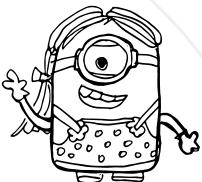
Pros

Cons

Pros

Cons

Final mission solution:





Define

Design Brief:

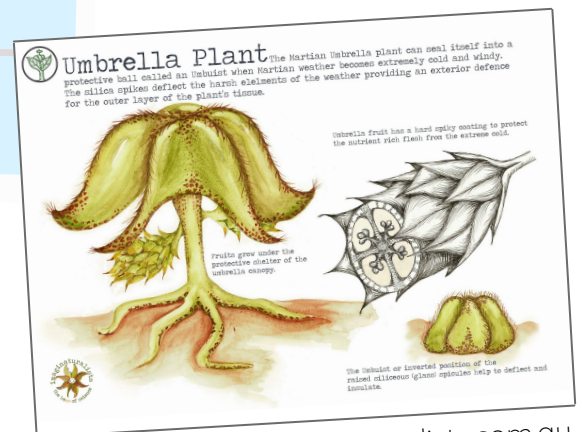
The 'brief' allows designers e.g. architects, engineers and scientists to write down what they understand about a project. It states the purpose of the design and how success will be measured, e.g. visually appealing to a particular group of people, correct size or shape, simple to operate, long lasting, sustainable, ethical.

Activity

In the space provided write the design brief for your plant growth mission.

Further Resources

Below is a list of additional resources that you might like to use in developing your ideas or learning how to act like an Astronaut. Click on the image to view the resource webpage.



imaginaturalists.com.au

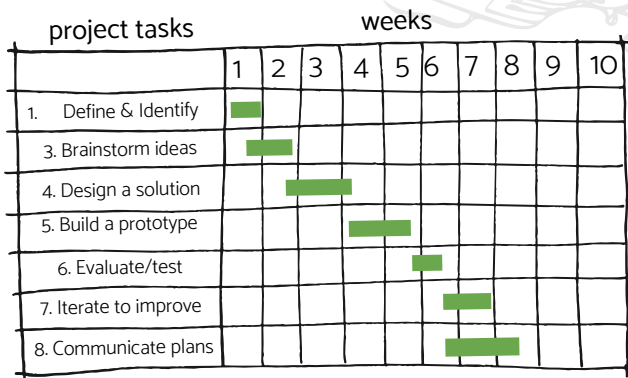




Identify

A constraint is a limitation that must be satisfied by a design, e.g. cost or time.

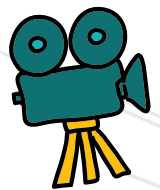
Time constraint



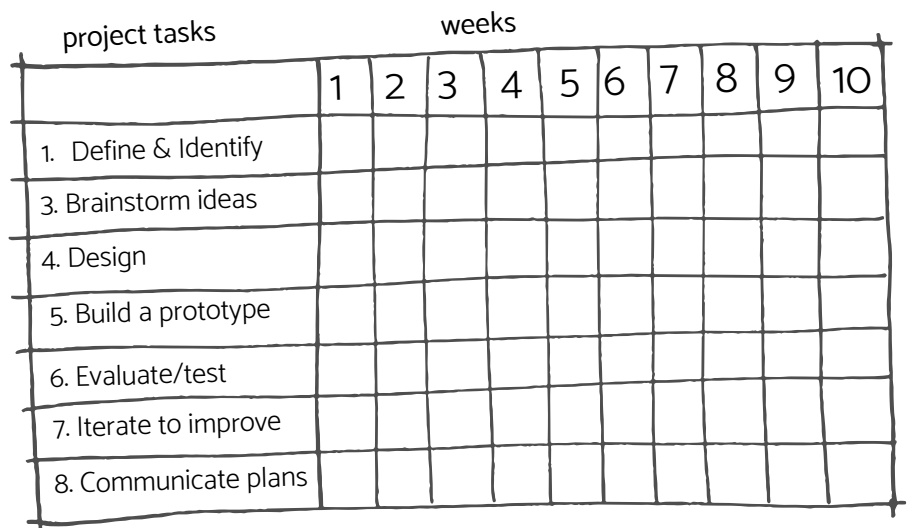
A Gantt chart is commonly used by industry as a tool in project planning. In the project shown (left), 'Iterate' and 'Communicate' are scheduled for the same week.

Discuss: Why might that be?

Task: Find out how long it took for NASA to put a person on the moon after President John F. Kennedy's famous speech to congress on space exploration?



Try scheduling your own project in the empty gantt chart (right). Your teacher will specify a project completion date. You may also be given a date for 'deliverables' for example, report on your progress at agreed 'milestones'.

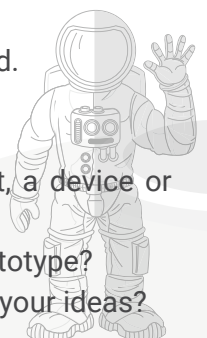


Materials

Identify materials

The available materials required to complete this mission is also a constraint. Identify materials that you might need to complete the mission. Add to the list (left) as the mission goes forward. Consider the following:

- Are you designing an experiment, a device or an environment?
- Are you producing a model or prototype?
- How will you communicate/pitch your ideas?



Projects need clear communication on tasks between team members.

Team members need to know

- What tasks are required?
- When are the tasks due?
- Who is in charge of which task?
- Have the tasks been done yet?



Trello is Australian software that combines project management with team communication. Below is a free public template that you can use for your project.



Use the QR code to
access the AVA
Trello template

With this template you can make your own Trello board where you can:

- add checklists on the cards
- suggest your ideas and add links to the cards
- move cards around to sort their priorities
- add colour-coded labels
- add file attachments for reference later
- assign who is going to be in charge of which activity
- create notifications for when the activities are due
- save the link to the template for the class to use
- play with it and make it your own!

Introducing Allan Ryan, Adjunct Professor at UTS Business School and founder of the Hargraves Institute. In our week 3 webinar Allan will demonstrate how Trello can be used for project management and communication.



Hargraves

I N S T I T U T E