

STEAM EDUCATION FOR SUSTAINABLE DEVELOPMENT and FUTURES LITERACY

SGD13 Climate Action and Sustainable Development



Programme Phase: Action Project

Leaving Certificate Support: Passion to Purpose CASD

SUBJECT AREAS: CSPE/ SPHE, Design, English and
Communication, Environment, Science, Sustainability, Technology



SDG 13 Passion to Purpose

Climate Action and Sustainable Development



Passion to Purpose

Climate Action & Sustainable Development

Action Project

Lesson 1: Discovering Passions & Gifts

Module Summary: Passion to Purpose CASD

Passion to Purpose CASD is a values-driven programme tailored for students and teachers completing the Climate Action and Sustainable Development (CASD) Senior Cycle subject.

By nurturing key 21st-century skills, Passion to Purpose CASD supports students working on their Action Project through sustainable, innovative, and socially responsible design practices. The programme enables learners to explore their passions and consider purposeful action, while developing essential skills that ignite innovation, foster empathy, and inspire change.

Aligned with the NCCA's vision for Senior Cycle—which emphasises student agency, values-based learning, and active citizenship—the programme offers a structured yet flexible pathway that complements the CASD specification. Students are guided through some of the design thinking stages empowering them to investigate local and global challenges, critically evaluate possible solutions, and co-create practical, meaningful responses.

For teachers, Passion to Purpose CASD provides scaffolded resources and professional learning support, helping them to facilitate student-led inquiry while embedding reflection, mindfulness, and peer collaboration into the classroom. For students, it is an invitation to connect passion with purpose—transforming ideas into impactful projects that respond to urgent environmental and social issues.

Passion to Purpose CASD bridges curriculum and action, offering a values-based framework that cultivates not only knowledge and skills but also confidence, resilience, and hope—qualities that are essential for young people to thrive as ethical leaders in a rapidly changing world.



The 7 lessons and resources are:

Lesson 1: Discovering Passions and Gifts

Begin with self-awareness. Students explore their own interests, strengths, and motivations.

In line with CASD's emphasis on student agency and identity, this lesson helps learners see themselves as active participants in shaping sustainable futures. By connecting personal passions to wider issues of climate action and sustainable development, students begin to uncover where their unique gifts can make a meaningful contribution.

Resources: Worksheets: What are your Passions and Gifts?, Teacher's Notes

Lesson 2: Understanding Values and Character

Help students articulate their personal values and understand how these influence their choices and actions. Through guided reflection, learners consider the relationship between their values, their behaviours, and the kind of change they wish to see in their communities.

Resources: Worksheets: Traits, Character, Virtues & Values

Lesson 3: Introduction to Design Thinking

Introduce the 5-stage design thinking process (Empathise, Define, Ideate, Prototype, Test).

This creative methodology gives students practical tools for problem-solving and innovation, closely linked to the Action Project's cycle of research, planning, and implementation. In the context of CASD, design thinking encourages learners to approach sustainability challenges with empathy, systems thinking, and openness to experimentation.

Resources: Worksheet: Introduction to Design Thinking, Worksheet: Wicked Problems

Lesson 4: Defining the Problem

Support students to define a meaningful, actionable problem linked to SDGs and their own values. This stage connects directly to the CASD learning outcome of analysing local and global issues through the lens of the UN Sustainable Development Goals. By framing their challenge in values-driven and achievable terms, students learn to balance ambition with feasibility—skills that are central to effective action planning in CASD.

Resources: Worksheet: Problem Tree Support Sheet: Define the Problem

Lesson 5: Empathy

Students engage with stakeholders, peers, or community voices to understand diverse perspectives on their chosen problem. In CASD, empathy is central to participatory citizenship and to exploring how climate and sustainability issues affect different groups in unequal ways. This lesson develops intercultural awareness, systems thinking, and ethical responsibility, helping learners ground their projects in lived realities rather than abstract ideas.

Resources: Worksheet: User Profiles Worksheet: Empathy Map

Lesson 6: Generating Ideas + Remix & Improve

Encourage creative and collaborative ideation, remixing personal and peer ideas for innovation. This aligns with CASD's focus on collaboration and creativity as critical 21st-century skills.

Students learn that innovation often comes from building on each other's contributions, testing multiple pathways, and refining ideas to better reflect sustainability principles and community needs.

Resources: Worksheet: Ideate Remix worksheet, Worksheet: Remix SWOT

Lesson 7: Prototyping and Pitching Your Idea

Build out project ideas and learn how to communicate value to an audience.

In CASD, the Action Project requires not only planning but also communicating solutions in ways that inspire change. This lesson equips students with the confidence to prototype their ideas, test feasibility, and develop compelling narratives that highlight the ethical, social, and environmental value of their projects.

Resources: Worksheet: RSB Rapid Response Prototyping, Concept Statement

Using the Resources:

If you wish to use these resources, we can offer an induction and online support throughout the module to help you plan integration into your projects and timetable. To register for this option, please contact us e:hello@futurefocus21c.com For more information on the resources please visit www.muinincatalyst.com

Setting up an online learning environment for the lessons on this module:

Our lessons integrate the use of virtual learning environments. To ensure seamless use of our lessons, a module should be setup on your school's virtual learning environment such as Teams, Google Classroom, etc. Learners are encouraged to upload documents to share with their peers. If your virtual learning environment does not support document sharing, we recommend OneDrive or Google Drive.

You can also use Google Sites or Microsoft Sway to encourage learners to present their work over the year - this can easily be set up to reflect the aims of TY and provide a showcase for their work as well as assessment tool.

Setting up a Canva Education account:

As our lessons integrate design, our lessons also refer to Canva. Educators and schools can open a free Canva for Education account by registering [here](#). Canva for Education provides primary and secondary school teachers and students with premium features and templates. You can then also set up lessons and invite your learners to the class.

External Expertise: Bianca Peel Consultancy and Education

Adaptations: Dr Anita McKeown and Rebecca White

- Dr Anita McKeown, FRSA, FIPM, MEI - is an award winning artist|scholar and STEAM educator, co-designing values-based leadership through education and community processes at the intersection of art, equitable placemaking, Open Source Culture and Technology (ethical and ecological implications),
- Ms. Rebecca White: UCD - is an educator, consultant, trainer and curriculum developer, focusing on STEAM education, project-based, student-led learning and professional development for place-based learning.

For more information or to access online support in integrating the programme into your existing teaching please contact: hello@futurefocus21c.com

Full references for this programme can be found in the Full Passion to Purpose Module Overview [HERE](#) which forms part of a seven-module programme on the Future of Innovation and Enterprise.

LESSON 1WS: PASSIONS AND GIFTS

13 CLIMATE ACTION



What are your passions and gifts?

Look at the key words below and try to define their meaning.

passions



gifts/talents

Passions and Gifts Statement Stems:

- At school/ work, I love to ...
- I feel passionate about ...
- I am excited about ...
- What I really like is ...
- My greatest contribution is ...
- I am particularly good at ...
- I am known for ...
- I have an exceptional ability to ...
- People often ask for my help with ...
- What motivates me most is ...
- I would feel disappointed, frustrated or sad if I couldn't do ...



- What observations can you make about yourself at this stage?
- Share your thoughts with a partner



Deeper Understanding

In pairs, share your self observations and discuss your rationales for your statements. Be prepared to share your offerings in groups and use question prompts to aid in discussion.

- To complete this task you must nominate:
 - 1.- a group leader to ensure all members have opportunity to speak and that time is kept to complete task
 - 2.- a speaker who will summarise the groups discussion for the class
 - 3.- a note taker whom will take notes for the speaker to summarise from

Question prompts

What responses did you give to the statement stems?

Explain why you chose this response?

What, if anything, did you find challenging in responding? Why?

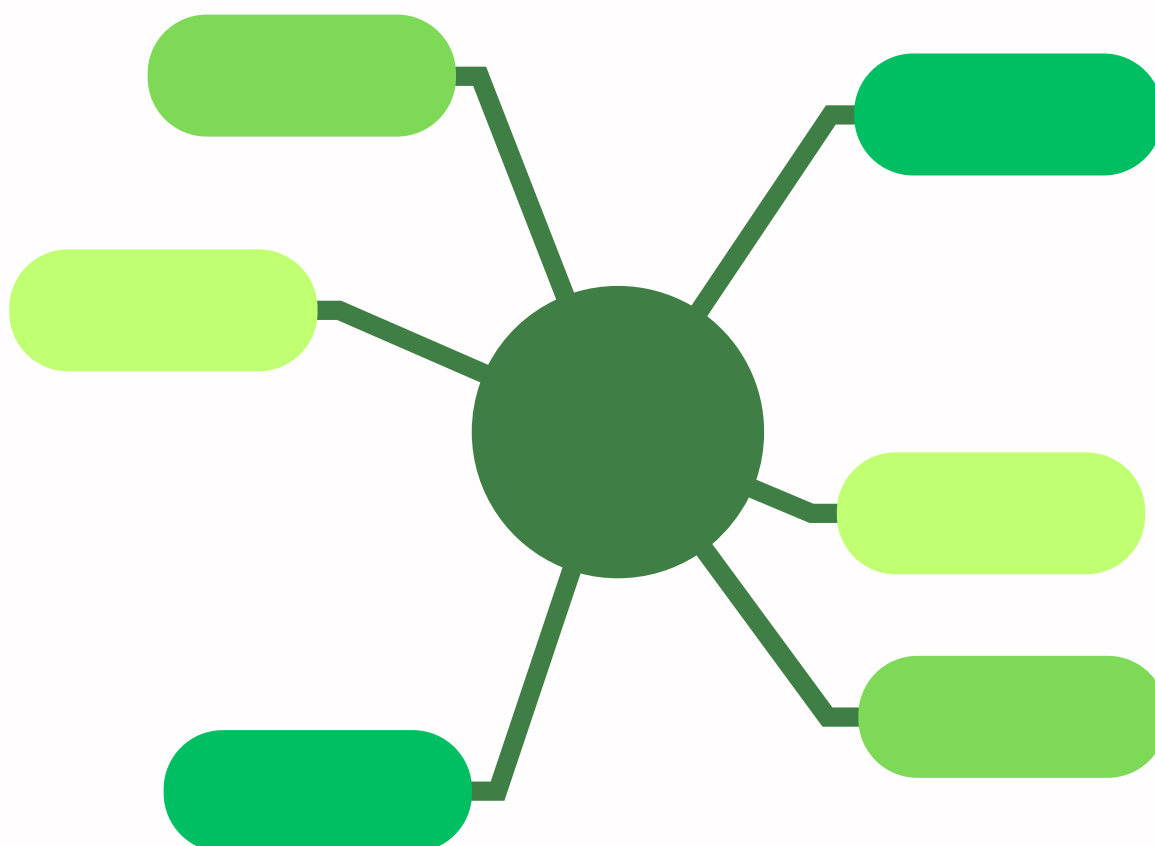
What responses do your group members have in common?

What was surprising about the responses?



EXTENSION ACTIVITY: Connecting Passions and Gifts

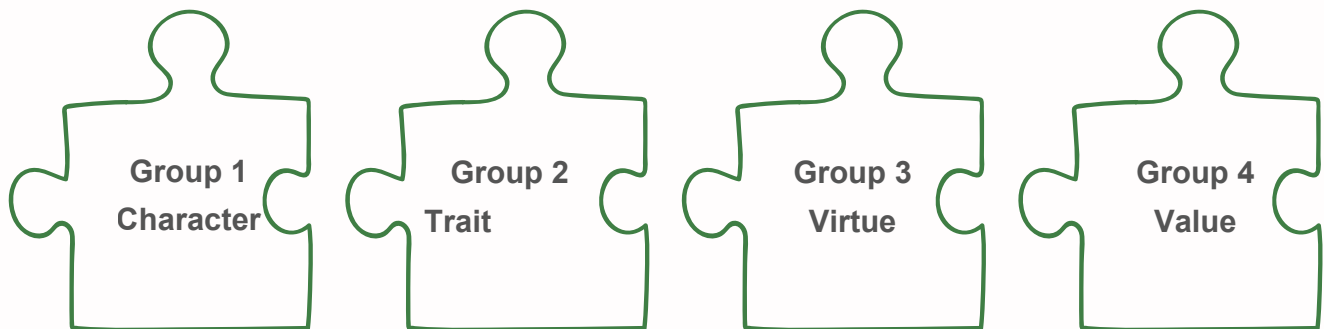
1. Brainstorm responses to these question prompts in groups of 3.
 2. Record your ideas visually using a mind map or flow chart or other visual representation.
- When we combine our passions with our gifts/talents what do you think the result could be?
 - How is our behaviour and actions linked to our passions and gifts?
 - What steps could someone take to make their passion something they can succeed in professionally in the future?
 - What kind of things do you do or others do that inspire and make you feel part of something meaningful?
 - What impact might they like to make on others?





Key Term Definitions

- Work in four groups, one per key word.
- Each group is responsible for finding the definition for one of the key words.
- Each group must look up three different sources for the same word to cross reference.



Definitions:

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Own words definition:

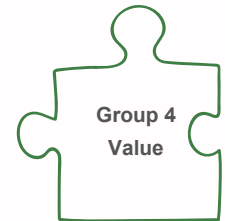
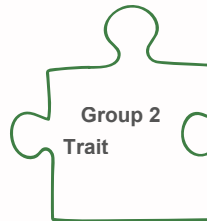
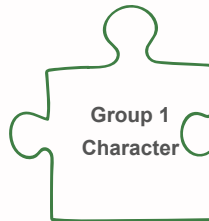
LESSON 2WS:CHARACTER, TRAITS, VIRTUES & VALUES

13 CLIMATE ACTION



Key Term Definitions

- Note your group's definition and the
- definitions you discover from other groups for the other words below:



Character

Trait

Virtue

Value



What are Character, Traits, Virtues & Values?

Idea storming Space



LESSON 2WS: CHARACTER, TRAITS, VIRTUES & VALUES

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Building Blocks of Character

Reminder:



- Values are goals or ideals or even opinions.
- Virtues are behaviours showing high moral standards.
- Virtues are how we practice and demonstrate character.



Building Blocks of Character

- In pairs or groups consider and discuss what you think are character virtues in terms of the four categories and complete the diagram with your ideas
- Define each virtue: intellectual, moral/ethical, civic, performance
- List at least three examples of these virtues under each category, an example has been done for you

INTELLECTUAL	MORAL/ETHICAL	CIVIC	PERFORMANCE
e.g. critical thinking	e.g. compassion	e.g. community	e.g. confidence

1. _____
2. _____
3. _____

Pair and Share

- Pair with another group and compare your ideas with each other.



Learning about complexity

Complex systems explained

https://youtu.be/c6-pnxSEZos?si=nV3B5_XRUgb3fdJS



What makes a system complex?

What is a Wicked Problem?

<https://www.youtube.com/watch?v=LOKpB4KtUZ8>

Watch the video and give four qualities of a wicked problem.

- 1.
- 2.
- 3.
- 4.

Climate Change is a Wicked Problem

<https://www.youtube.com/watch?v=XRoCxS6n53U>

How can Design Thinking help with Wicked Problems?

<https://www.youtube.com/watch?v=WrdSkqRypsg>



Watch both the videos above and give three areas you might use design thinking to work on an aspect of climate change.



WHAT IS DESIGN THINKING?



<https://youtu.be/a7sEoEvT8l8?si=aXwMU2LWYF7OMMxX>

Find the meaning of the following vocabulary, and summarise in your own words.

Context -

Culture -

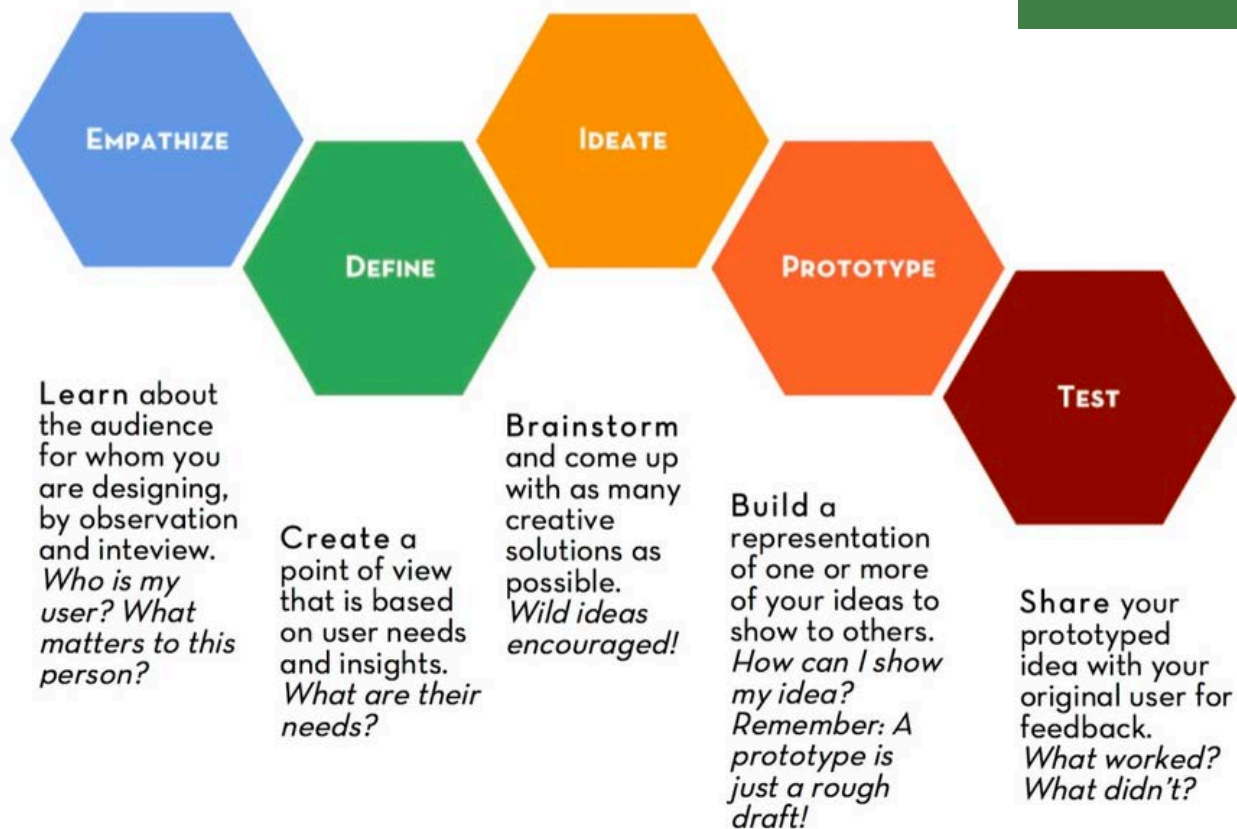
Empathy-

Stakeholders -





The Five Stages of Design Thinking:



Before you start to work on your problem or project have a look at each stage and see what you need to think about in any project. You will also have to manage your time as the last three tasks will take more time.



Empathise - Most projects will involve people at some point. What might you need to think about - Discuss with your partner and write down three things that might matter to a user / audience member

- 1.
- 2.
- 3.

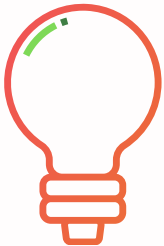


Define - What's your problem? `Often we deal with symptoms - a runny nose, a sore throat, but we need to deal with our immune system. In defining your problem you will look at the whole system. Write down three problems you know of in your community or the world.

- 1.
- 2.
- 3.



The 5 Stages of Design Thinking:



Ideate - This is the stage in the process to think about as many ideas as possible. For now, write down the two worst ideas you can think of - swap them with your partner and try to create three good ideas from each others bad ideas.

Bad Ideas.

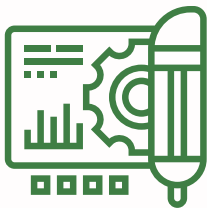
Good Ideas

1

1.

2.

2.



Prototype- using only one piece of paper, build or make one of the good ideas above. You will have to be creative, how will you make the shapes; folding, tearing? If you are to fix it together, how might you do this - links, cutting, what other ways of joining things together can you experiment with?

Remember: There is no right answer this is about experimentation - have fun!



Test - The final stage is testing. In this stage you learn about the product, service or idea you have created . Share your 'good idea' prototype with your partner.

Things to discuss / consider and questions to ask your partner:

1. Who might the user be?
2. Look at how it is made - remember there were limits to materials so you are looking at their problem solving and creativity.
3. Is there anything they could try to make it better or improve it using the materials they had?
4. How might you explore the idea further if time and materials were not a limit?



L3 WSB: STAKEHOLDER MAPPING

Stakeholder Mapping

A project's stakeholders are the people or groups of people who can impact or are impacted by a project. If doing a project you will need to understand the different parties involved and how you will need to communicate and engage with them.

You will now begin to undertake a stakeholder mapping of your local place. Usually you will start this by having your decision challenge at the centre of your mapping.

Individually or as a class create a list of all the different individuals, groups, or organisations that you can begin to identify and categorise who you might need to discuss or share your project with.



SERVICES / PROVIDERS



**USERS /
BENEFICIARIES**



GOVERNANCE



INFLUENCERS

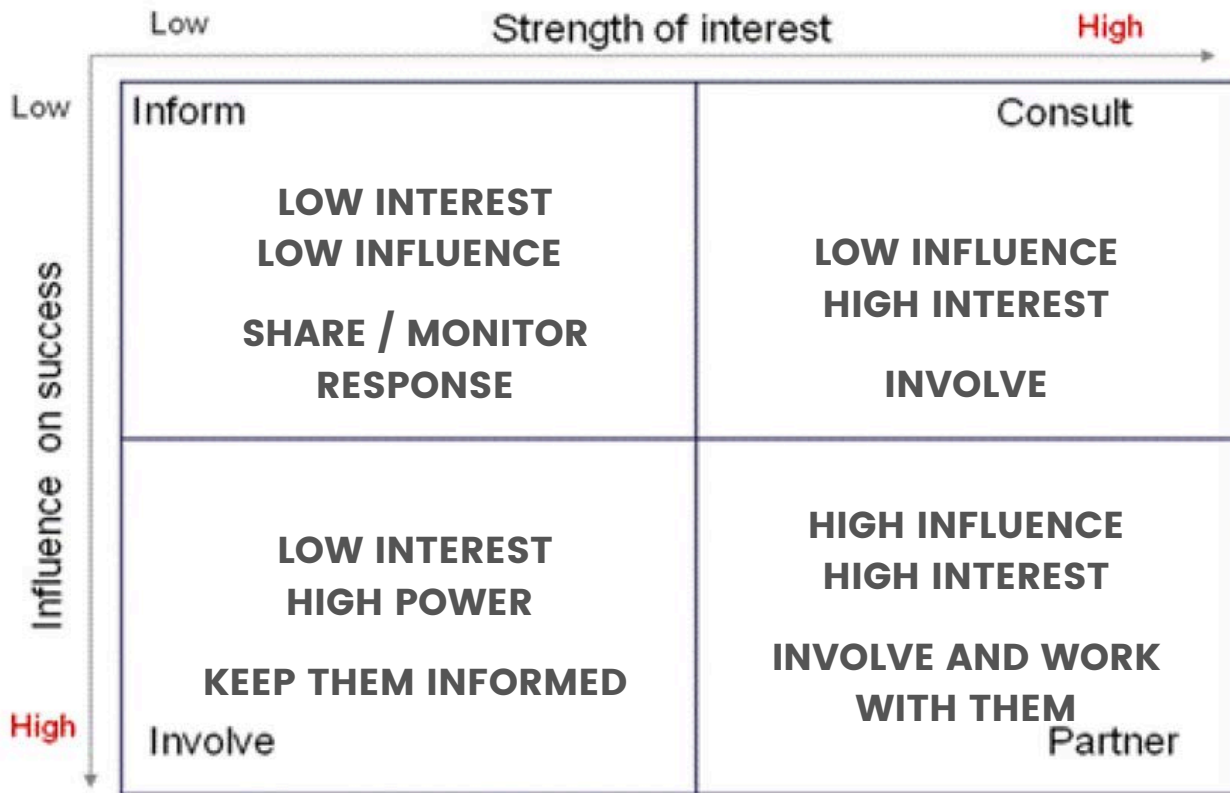
L3 WSB: STAKEHOLDER MAPPING

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DIFFERENT WAYS OF MAPPING

Now that you have a list you are going to practice organising them with project samples



1. You are developing a skate park in a square in the centre of town - use your own town / village and pick the most central spot.

Use the grid above to organise your list of stakeholders and how you will need to communicate and engage with them.



2. You are wanting to create a youth music festival for your town / village.

Use the grid above to organise your list of stakeholders and how you will need to communicate and engage with them.

You will undertake another stakeholder mapping once you have your own project idea..



What is the purpose of a problem tree?

The 3 most important points of a problem tree are:

- It allows us to break down the problem, the causes and its effects, improving its analysis.
- There is a better understanding of the problem by breaking it into causes and consequences.
- Facilitates the realisation of other important components of a project in its planning stage, e.g. stakeholder analysis, risk analysis and objectives.

When introducing the exercise and worksheet: Using a Problem Tree, it might be helpful to discuss an example on the board so that students are clear on what is meant by problem, impact, cause, and effect.

Remind them that there can, and usually will be, more than one impact, cause, solution, and effect. Show them how the effect of a solution might bring up a new problem to solve and take through this process.

Step-by-Step:

- Analyse the situation: What is happening, why is it happening and what is triggering it. Collect data that will allow you to understand the problem situation, this will help
- Identify the main problems of the situation you have analysed: Use brainstorming, defining by consensus what the main problem is.
- Determine the effects and causes of the main problem: You already have the trunk of the tree, now identify the causes (roots) and the effects or consequences (leaves or branches). Again, it is better if this is done as a team, seeking to reach a consensus. If in step 2 you elaborated the Vester matrix, you will already have this step quite clear.
- Draw the tree: Simple. We will see how in the example below.

Example:

Problem = People need to access a local walking trail in the evening after work and it gets dark early in the winter.

Impact = No one uses the trail in the evenings in the winter the space is wasted.

Cause = (1) It gets dark early as there's no natural light. (2) People don't feel safe using the trail in the dark. They can't see where they are going and might trip and fall. It's dull and boring in the dark.

Solution 1 = We install lights.

Effect of solution 1 = We can't just install any lights, we have to align to policy SDG 7 / SDG13 carbon emissions.

LESSON 4: USING A PROBLEM TREE

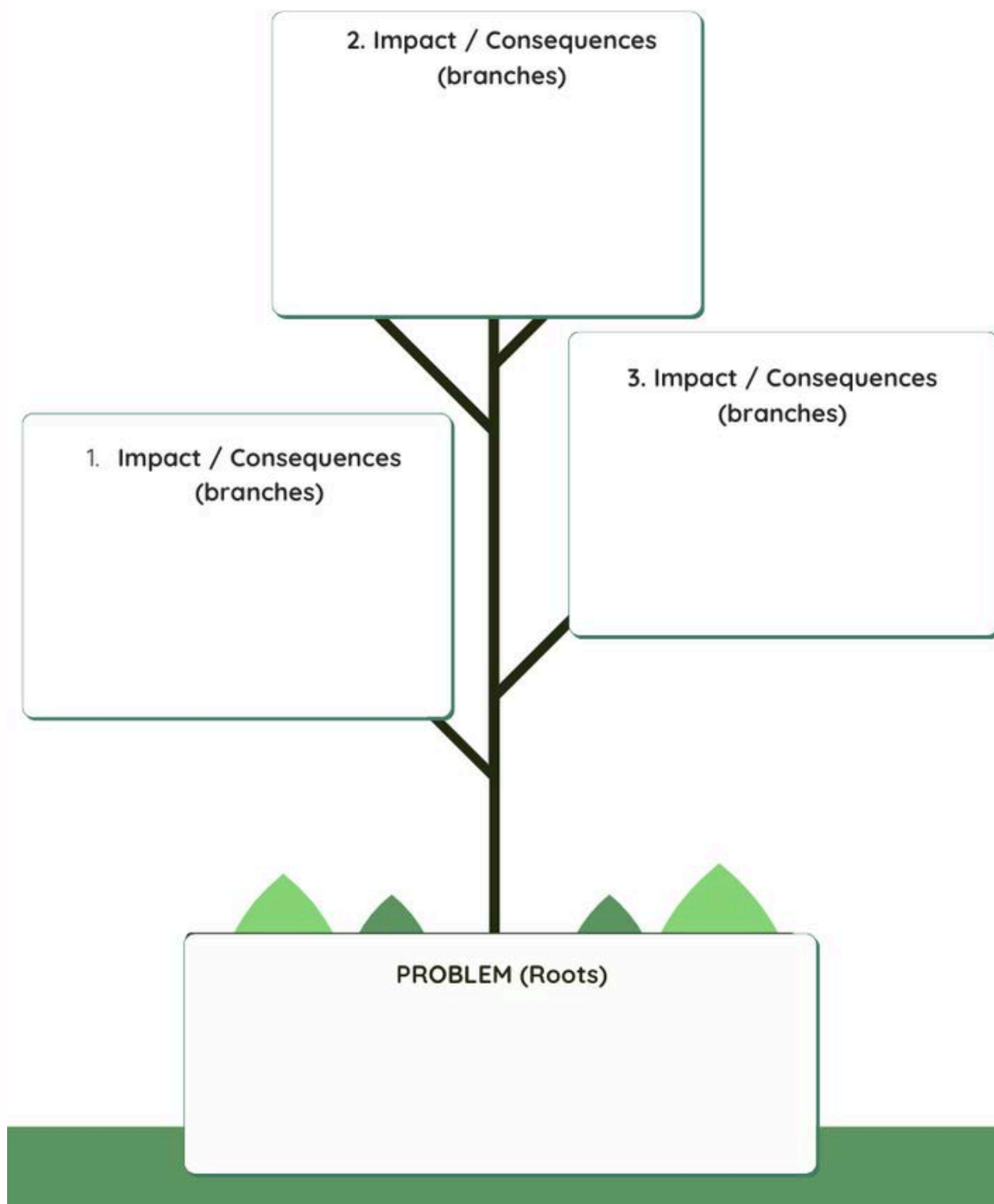
13 CLIMATE ACTION



How to Use a Problem Tree Analysis

<https://www.youtube.com/watch?v=q6qYZiW5BWU>

Teacher Training - World Learning



LESSON 4: STEP INTO THE PROBLEM

This worksheet helps you think about your users and any issues they might have.



● What's the Problem - A ● Empathy A, Step into the problem ● Possible ideas / Solutions:

● What's the Problem - B ● Empathy B, Step into the problem ● Possible ideas / Solutions:

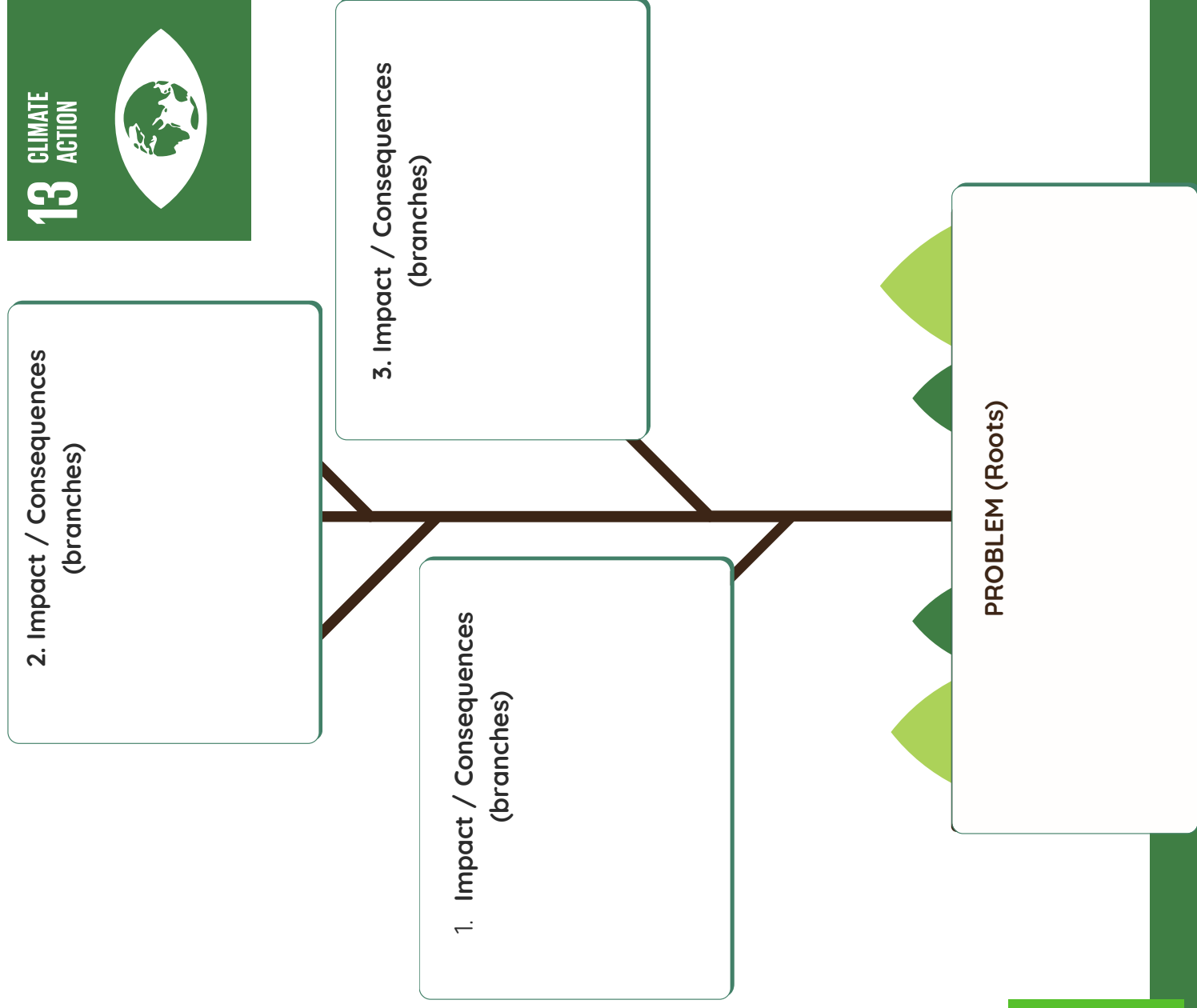
● What's the Problem - C ● Empathy C, Step into the problem ● Possible ideas / Solutions:

Name: _____

Date: _____

LESSON 4: USING A PROBLEM TREE

In each of the 'branches' try to write down - the impact / consequences that might arise due to the problem you have identified.



4
QUALITY
EDUCATION



11
SUSTAINABLE CITIES
AND COMMUNITIES



14
LIFE BELOW
WATER



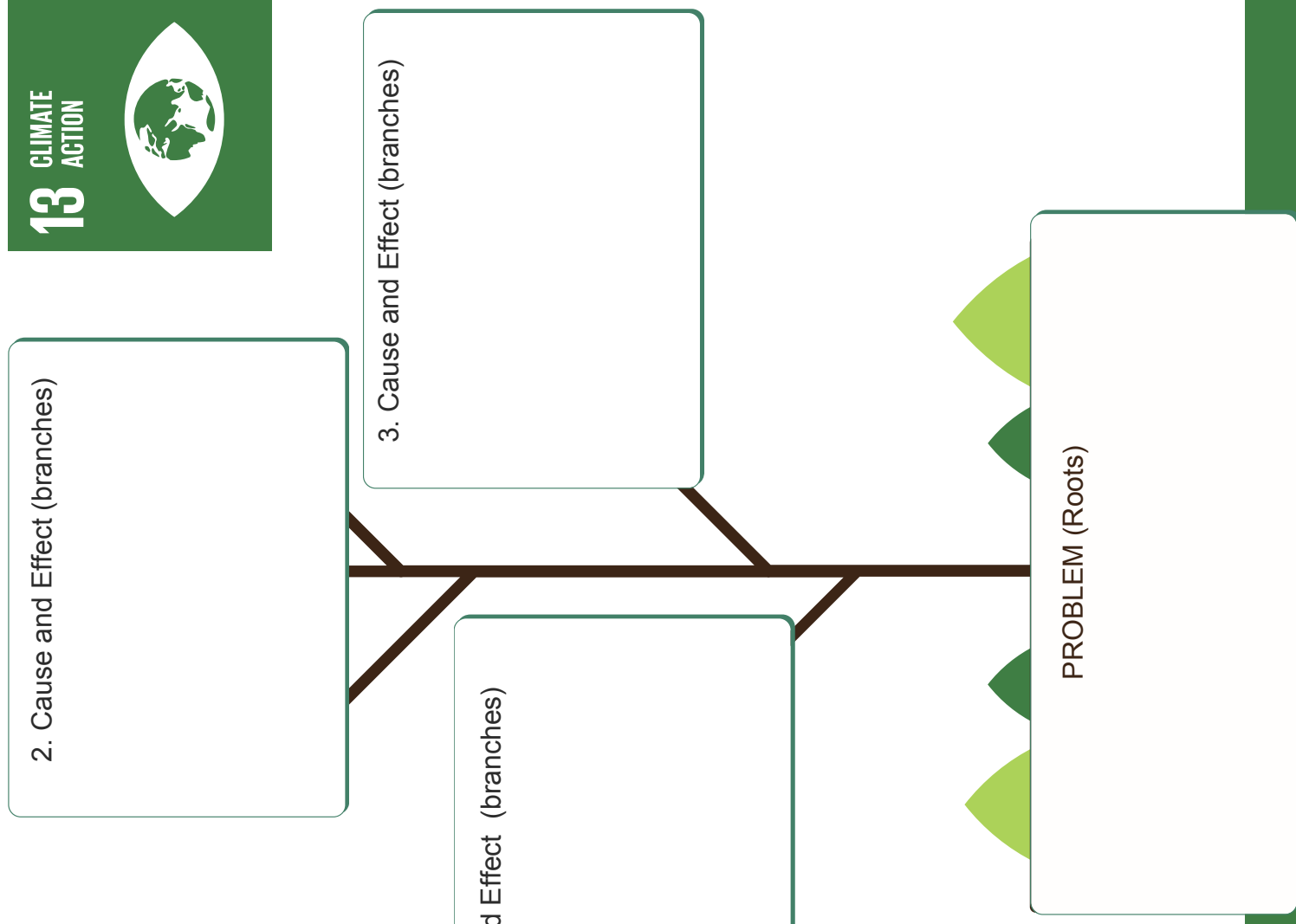
15
LIFE
ON LAND



LESSON 4: USING A PROBLEM TREE

For each impact / consequence, ask what causes it? and what is likely to be the 'ripple effect' (happens as a result of action),

NB: Often what we think is the cause is only a symptom, try to consider what might be the root cause of the problem



4
QUALITY
EDUCATION



11
SUSTAINABLE CITIES
AND COMMUNITIES



14
LIFE BELOW
WATER



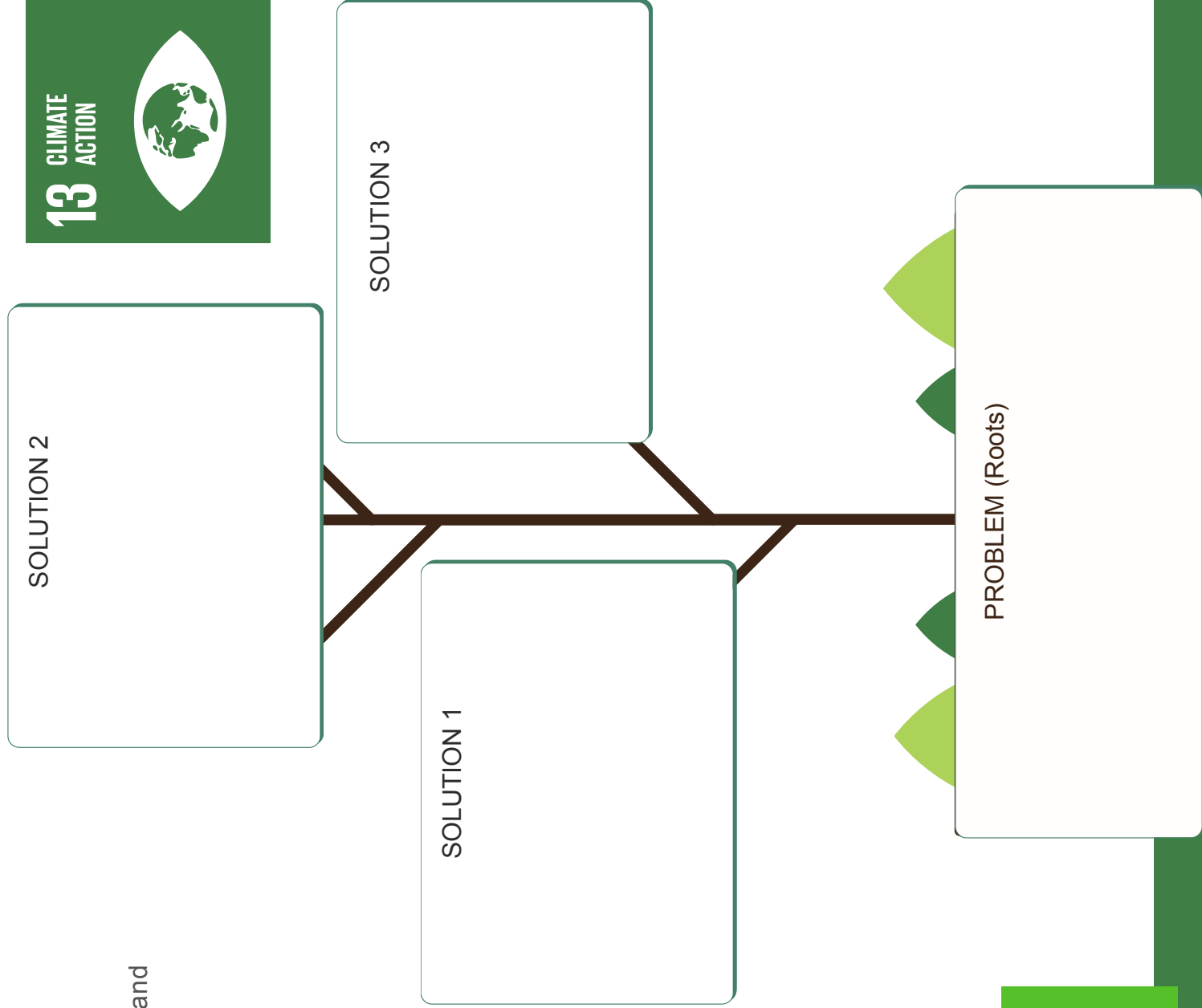
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LIFE
ON LAND



LESSON 4: USING A PROBLEM TREE

Try to think of three different ways to create a solution and pick what YOU think might be the best and explain why

We choose solution number _____ because _____



Lesson 5: Empathy Map

Understanding Your User

What does your user think and feel?

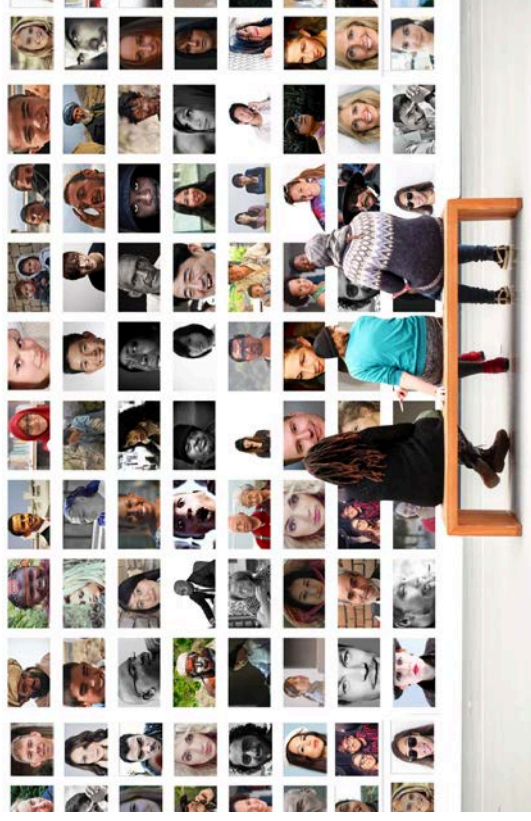
- What really matters to them?
- What do they think about?
- What are their worries, dreams or aspirations?

THINK AND FEEL

What sort of things does your user hear / listen to?

- Where does your user get information?
- Who might your user listen to or be influenced by?

HEAR



SEE

What does your user see?

- When do they use the town and what do they see
- Do they walk, cycle or drive through the town?
- What might they notice?

WHAT DO THEY SAY AND DO

- What other things might your user do?
- What other things are they interested in?

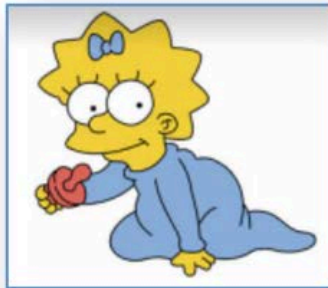


LESSON 5: USER PROFILES

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Grandad is an old man who is achy and sometimes a bit grouchy. He has trouble getting around, so he walks with a cane. He also has difficulty getting into and out of his chair, though he sits in his chair most of the day.



Maggie is a 1 year old who loves to play and crawl around everywhere. Maggie likes to explore on her own and be independent while she sucks on her dummy. When it's time for her to sit still she gets whiny and squirmy.



Neil is an astronaut who travels to space. When he is in his space ship, he is in a weightless environment. This is cool most of the time, but it is a challenge when he needs to sit down and drink his Sprite. Neil also has a bulky space suit that often gets in the way.



Lisa is a marathon runner who runs every single day. She hates being stationary, and because she exercises so much she has really sore muscles. When she finally does sit down it's really important that her chair be very comfortable to help her relax and recover for her run the next day.



Ralph is at secondary school and spends 8 hours a day in class. Most of the time, Ralph has to sit in uncomfortable chairs, sitting up and facing the front of the room. When Ralph moves between classes, he carries a large backpack. When he gets to class he needs a place to put his stuff.

ORIGINAL 5 CHAIRS CHALLENGE CONCEPT: STANFORD DESIGN SCHOOL



LESSON 6 WSA: Idea Remix 1

This worksheet will help you play with ideas using your own experience and pastimes.

Fill in the boxes - we will then work with the whole group to develop a number of possible ideas.



What is one of your hobbies?



What do you like about your hobby?



What are some obstacles that make doing your hobby difficult?



What would make it easier to do your hobby?

Hobby

Likes

Obstacles

Change

Hobby

Likes

Obstacles

Change



LESSON 6WSb: Remix 2

This worksheet will help you play with ideas using an adaptation of a SWOT analysis, replacing the categories with Purpose, Strengths, Weaknesses and Users. Fill in the boxes for each of your team's three different project ideas.

For a standard SWOT analysis use Strengths, Weaknesses, Opportunities and Threats



Purpose



Strengths



Weaknesses



Users

Purpose

Strengths

Weaknesses

Users

Purpose

Strengths

Weaknesses

Users



INTRODUCTION

Watch the following video: 'What is Design Thinking?'

<https://www.youtube.com/watch?v=a7sEoEvT8l8>

Answer the questions below. You can re-watch the video as many times as you need to.

a) What or who does design thinking help you focus on?

b) How do design thinkers learn?

c) What do simple prototypes do?

d) What do rapid prototypes do?

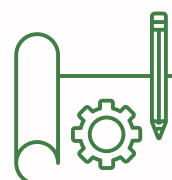
e) If you ideate, prototype and test too early - what are three mistakes that can be made?

f) Write down the two reasons for using design thinking.

g) What are the five stages of design thinking?

Watch the video: 'How to make a cardboard prototype'

https://www.youtube.com/watch?v=k_9Q-KDSb9o Write down as many tips as you can.





READY, STEADY, BUILD: KNOWLEDGE GATHERING

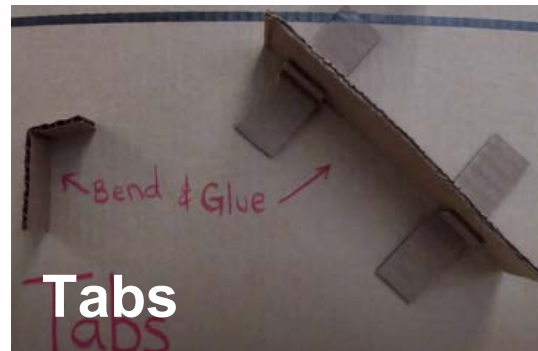
Today we are going to experiment with rapid prototyping with materials that we have at hand. You will explore three basic elements - useful for rapid prototyping:

- Structure
- Fastening / Joining
- Surface

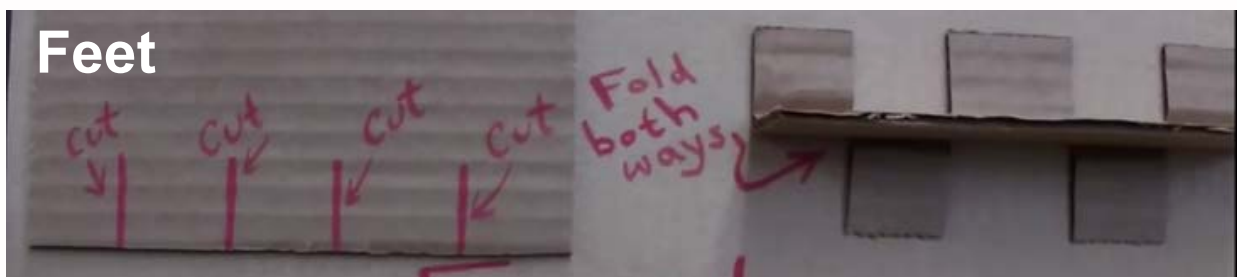
1. Structure - this will provide support and form to your prototype. The structure provides strength by load-bearing if re-enforced or solid, e.g. columns or supports for covering or other materials, e.g. tent poles. Here's some simple tips for creating structure.



Flange



Tabs



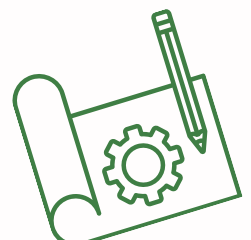
Feet



Watch the short video from Megan Peterson on structural techniques - all these processes can be scaled up to make bigger models and forms.

Write down the key ideas in the video. Use bullet points.

Creating 3D sculptures <https://www.youtube.com/watch?v=pi6Y7yCz7Y8>



LESSON 7: RAPID RESPONSE PROTOTYPING

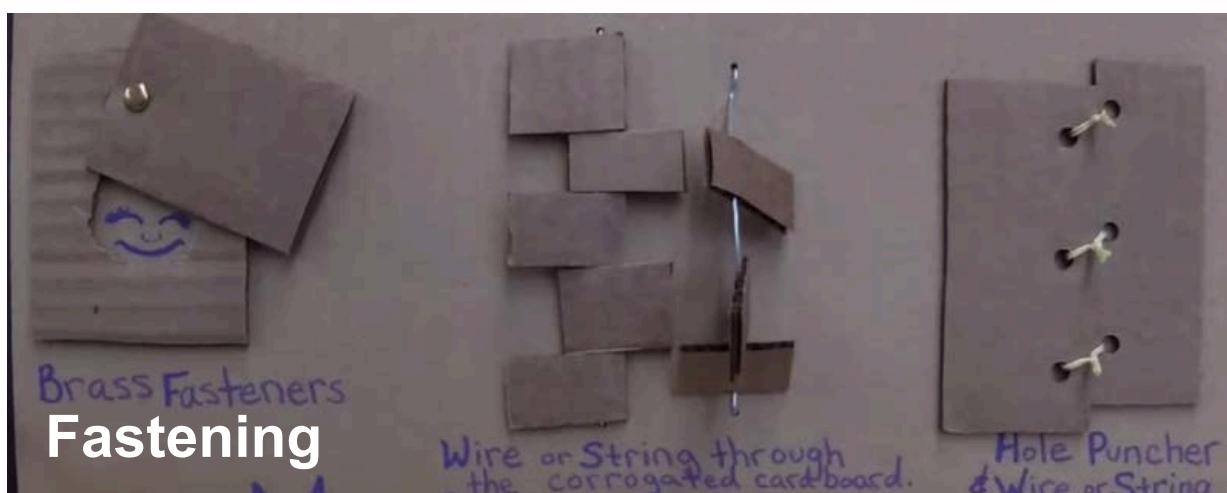
13 CLIMATE ACTION



2. Fastening / joining and attaching - this can be done using structural approaches such as slots and tabs or using other materials like pins, paperclips, string, tape or glue.



Tabs and Slots



Fastening



Some techniques can be both structural and used to join things together like the slots / tabs - here on the left.

What other ways do you know of joining things together? Discuss this in your group and make a list.

Knots are another useful joining technique- here's a useful website for learning to tie knots <https://www.animatedknots.com/complete-knot-list>

LESSON 7: RAPID RESPONSE PROTOTYPING

13 CLIMATE ACTION



3. A surface - a surface has a number of functions, e.g. protection, decorative, textural, adhesive, and are made from numerous materials, e.g. plastic, wood, fabric, paper, both natural and synthetic.



Sometimes they can be structural as well as serving other functions. This surface material could provide support and be used as an attachment or joining function as well as offering a decorative purpose.



Natural materials often have other properties such as insulation, waterproofing, protection as well as being structural, making them good for outdoor construction.



Waterproof or those that are water repellent materials, (hydrophobic) are often inspired by nature, whether a rough surface that minimises water contact and absorption or the nanopatterns of insects who fly in the rain undisturbed. You can also treat materials with sprays to make them waterproof.



Safety surfaces can be both decorative and functional. They often use bright colours and recycled materials from other processes. They can be highly durable and so reduce maintenance.



Interior design surfaces, e.g. upholstery, curtains, wallpaper, bedding, worktops, are increasingly synthetic and made from recycled materials, e.g. SeaQual or Econyl from recycled fishing nets. They can be durable and easily cleaned and pleasurable to look at.

LESSON 7: RAPID RESPONSE PROTOTYPING

13 CLIMATE ACTION



READY, STEADY, BUILD: THE CHALLENGE

The Challenge:

1. Indoor activity - set by the teacher.
2. Outdoor activity - selected from the list below in Challenge 2.

The rules of the challenge:

1. 5 minutes to plan + 15 mins to build a prototype.
2. You must include at least one material / object from each element:
 - Structure
 - Fastener / Joiner
 - Surface

Challenge 1 (Indoor): Set by the teacher.

Challenge 2 (Outdoor):

Select one of the following challenges to complete in your team.

1. Create something to shelter from the weather - wind, sun, rain.
2. Create something to encourage more biodiversity or wildlife to the area.
3. Create a raised bed that stops animals eating what's growing but looks good and is interesting.
4. Create a table / seating that allows buggies, and wheelchairs to fit comfortably.

Post-Challenge Discussion

Let's discuss each team's design. Use these questions to help focus the discussion:

- How would you help them?
- What might be the next stage of the project?
- If this was to be developed, what are the issues that should be considered e.g. users' needs, surveys, market research?
- Is there anyone local that they could talk to if this was a real project?



LESSON 7 WSB: CREATING A CONCEPT STATEMENT

13 CLIMATE ACTION



What is a Concept Statement?

A concept statement summarises a project's meaning, purpose, direction, and depth. Concept statements are used at the beginning of the project planning stage. Within innovation and product development, the concept statement helps to focus ideas and keep the team on task.

Use the prompt boxes below to help your team create a concept statement for your game and its users.

1. Define the need in two sentences



You are developing a product, system, service or solution for... Who? (tell us about your user / client). To do what? (This is the purpose of the product, system, service or solution include your specific idea / focus).

2. The problem / issue - explain how your concept will address the problem



3. Users' / Clients needs - tell us about your user / client and their needs



4. Details- explain how your ideas's concepts meets this need

