

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.

SDG 13 Passion to Purpose

Climate Action and Sustainable Development



Passion to Purpose

Climate Action & Sustainable Development

Action Project

Lesson 1: Discovering Passions & Gifts

Lesson Title and Summary: Discovering Passions & Gifts

Identifying what brings you excitement and joy is essential to finding direction. Analysing what we love to explore and learn about helps us find vision and purpose by identifying the things and people we love.

Like a puzzle, our vision holds the larger picture and our passions, gifts and talents, or otherwise known as strengths, are the pieces of the puzzle that lead to a purposeful life and work journey. In this lesson, learners will begin to develop self awareness and gain an understanding of their purpose or vision and in doing so, develop skills in increasing social awareness.

Vocabulary:

Passions, Gifts, Talents, Values, Purpose, Vision

In this lesson, the learner will:

- develop skills in increasing social awareness
- gain understanding of the concept of "purpose" and "vision" in relation to project development, employability/entrepreneurship
- engage in relationship building

Materials

- Worksheet: Passions and Gifts
- Teacher's notes: Passions and Gifts
- Post It notes



SDG 13 Passion to Purpose

Lesson 1: Discovering Passions & Gifts



Activity Instructions

Activity 1 Lead In (10 mins)

1. Ask learners to discuss the following three questions in pairs:
 - What are some examples of things people love or don't like doing or being?
 - What are some examples of things people do well or excel at doing or being?
 - What are some examples of things people consider important?
2. Briefly elicit general answers from the class adding them to the board.

Activity 2 Passions and Gifts (15 mins)

1. Encourage learners to define their meaning of key terms "passions" "gifts/talents" using their own words. Give them some time in pairs to discuss before sharing as a whole group.
2. *Ask learners to take time to consider what their passions and gifts are by considering and completing responses to statement stems on their Worksheet: Passions and Gifts.*
NOTE: many learners find this activity particularly challenging and therefore may need additional support. Make sure prior to going through the instructions that you highlight to learners to ask for help if they are feeling challenged.

Activity 3 DEEPER UNDERSTANDING (25 mins)

1. In pairs, learners share their self observations and discuss further their rationales for their statements in the worksheet.
2. Learners then move into groups of four and use question prompts to aid discussion. To complete this task they must nominate: a group leader to ensure all members have opportunity to speak and that time is kept to complete task, a speaker who will summarise the groups discussion for the class, a note taker whom will take notes for the speaker to summarise from.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Rather than use Post-Its you also can set this up as a Mentimeter poll [mentimeter.com](https://www.mentimeter.com)

SDG 13 Passion to Purpose

Lesson 1: Discovering Passions & Gifts



EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, reduce the timing of Activity 3 and set final reflections as an at-home writing task.

Extension: For a longer class, extend timing of Activity 3. Groups can brainstorm as a discussion, recording their ideas in a mind map, a flow chart or using Post-It notes. This work encourages conditional reasoning and deductive equivalents; an essential skill for project management and team working with problem solving.

Option B: Watch Video: Where Passion Comes From (see Media Box) and follow with a class discussion.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Video: 'Where Passion Comes From' | Simon Sinek [4:47 min]

<https://www.youtube.com/watch?v=zoMQaru8zU4>

Video: 'Spheres of Influence Explainer' Video: [6:38 min]

https://www.youtube.com/watch?v=CZt3QkRE_SA

Video: 'How I Quit My Job' | Pursuing Your Passion [24:38 min]

<https://youtu.be/lnlQGOinPfo>

Article: 'Passions and Gifts', By Ford R. Myers, President, Career Potential, LLC

<https://careerpotential.com/career-advice-article/passions-and-gifts/>

Local Trip / Expertise / Additional Work and Assessments

Watch Video: Spheres of Influence Explainer and encourage learners to choose three people from different areas of their Spheres of Influence and interview them using the prompts in the worksheet from this lesson. This activity will further develop perspective-taking and relational thinking, which they can then summarise in writing up their findings.



WHAT ARE YOUR PASSIONS AND GIFTS?

Many learners find this activity particularly challenging and therefore may need additional support. Make sure prior to going through the instructions that you highlight to learners to ask for help if they are feeling challenged.

Passions and Gifts Statement Stems:

- At school/ work, I love to ...
- I feel passionate about ...
- I am excited about ...
- What I really like 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 ...

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?

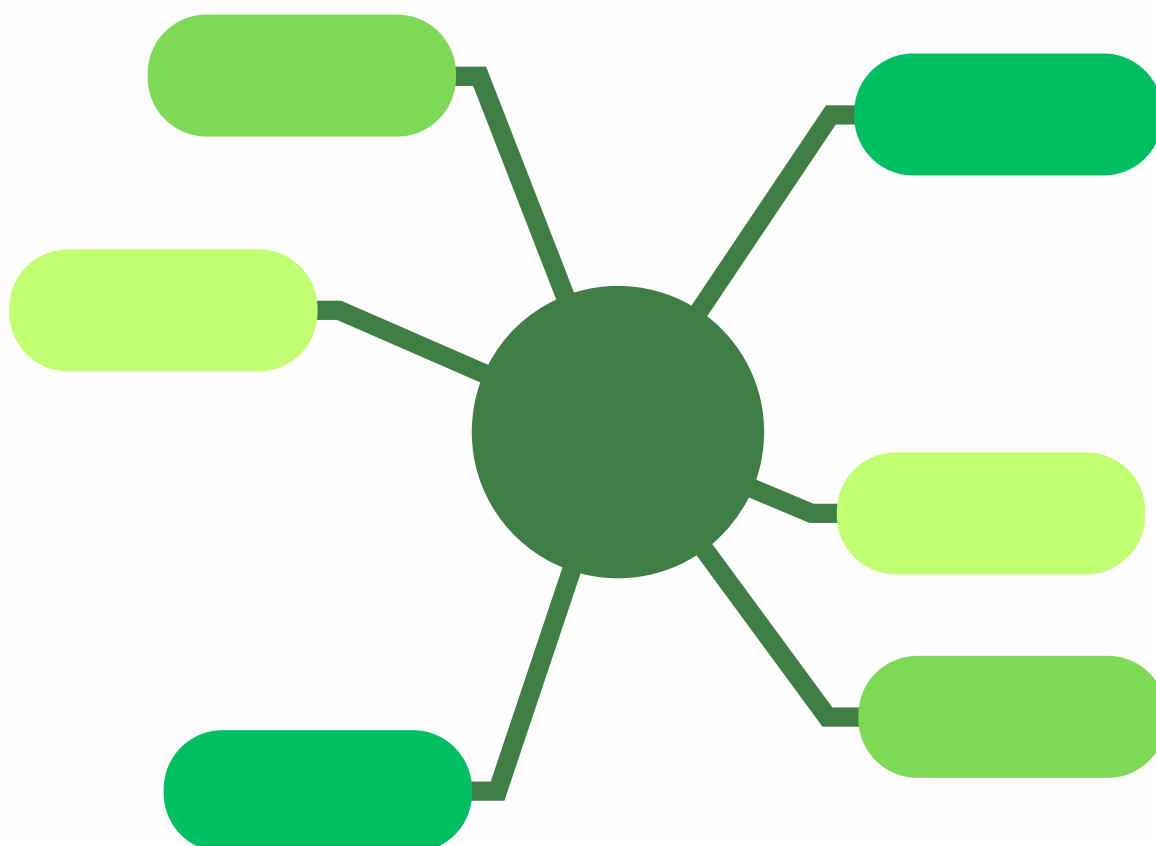
What responses do your group members have in common?

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?



SDG 13 Passion to Purpose

Climate Action and Sustainable Development



Passion to Purpose

Climate Action & Sustainable Development

Action Project

Lesson 2: Understanding Values and Character

Lesson Title and Summary: Understanding Values and Character

Gaining awareness and understanding of our character, virtues and values is key to having a realistic sense of self and in developing confidence and a positive mindset. Our virtues are qualities or traits which build up our character. The set of beliefs or attitudes that define what sort of person we are is our character. The way in which we live and work is determined by the things we believe are important, these are our values.

To an extent, these our values are the measure by which we mark our progress in our lives and generally what should determine our priorities. This lesson offers an exploration into character, virtues and values, particularly four types of values - ethical, performance, civic and intellectual.

Vocabulary:

Character, Sphere of influence, Trait, Value, Virtue

In this lesson, the learner will:

- explore and gain understanding of the concepts of character, virtues and values
- gain understanding of four types of values; ethical values, performance values, civic values and intellectual values
- be introduced to the concept of 'building blocks of character' when referring to virtues and identify personal virtues

Materials

- Worksheets: What are Character Traits, Virtues & Values?
- Dictionary
- Game of Jenga blocks
- Internet access



SDG 13 Passion to Purpose

Lesson 2: Understanding Values & Character



Activity Instructions

Activity 1 What are Character Traits, a Virtue, a Value? (10 mins)

1. Organise learners into four groups. Allocate each group a key term to explore; Group 1 = character, Group 2 = trait, Group 3 = virtue, Group 4 = value, and instruct each group to find a definition for their word (they need to look up 3 different sources for the same word to cross reference). Using their three definitions, they must put them into their own words using the brainstorming space on Worksheet: What are character traits, virtues and values?
2. Regroup learners into Hive Mind groups - put a representative from each word into a group and invite each to share definitions.

Activity 2 Building Blocks of Character (30 mins)

1. Elicit words from learners to describe the structure of the Jenga Blocks when constructed (solid/ strong/ formidable). Remind learners that values are goals or ideals or even opinions, virtues are behaviours showing high moral standards equals virtues are how we practice and demonstrate character.
2. Briefly play the game as a whole class, inviting learners to come and remove a block from the structure until the structure topples. Don't play for more than 5 minutes.
3. Elicit what made the structure unstable (top heavy/poor foundations) and compare the Jenga structures, before and after, to the concept of strong or weak "character".
4. Using Worksheet: What are character traits, virtues and values?, use the Building Blocks of Character diagram on character and invite learners to work in pairs to discuss what makes up someone's character and ask them to consider and discuss this in relation to four types of virtues: ethical / moral - performance - civic - intellectual.
5. Direct learners to complete the diagram on their individual worksheets with their discussed ideas and to define each virtue and list at least three examples of these virtues. An example has been offered for each. Further examples are available from The Jubilee Centre Framework for Character Education in Schools (see Media Box).

Activity 3 Pair and Share (10 mins)

1. After completing their virtues diagram, learners pair and share to compare their diagrams with each other. Use The Jubilee Centre Framework for Character Education in Schools diagram, if required, to support further understanding.

SDG 13 Passion to Purpose

Lesson 2: Understanding Values & Character



REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Rather than use Post-its you can set the reflection up using a Mentimeter poll [mentimeter.com](https://www.mentimeter.com)

EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, complete Activity 1 & 2 only, and use Activity 3 as a lead in for the next lesson.

Extension: For a longer class, explore benefits of positive character development. Use the sentence stems in Activity 3 as a discussion or writing-based activity.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Video: A Question of Character Promo Trailer [2:24 mins] <https://youtu.be/ouHugNGYQrk>

Diagram: Jubilee Centre's 'Building Blocks of Character' Diagram 1 - <https://tinyurl.com/2p9dv5ma>

Website: Positive Character Development

<https://www.jubileecentre.ac.uk/1700/character-in-the-professions-teaching>

Website: Six Pillars of Character <https://charactercounts.org/character-counts-overview/six-pillars/>

Local Trip / Expertise / Additional Work and Assessments

- Create an infographic to communicate what building blocks of character means, either individually or collectively, of what they have learned and identified to be building blocks of character or pillars of character. See Media Box for inspiration.
- Invite local business owners, law enforcement and community members to speak on the topic.
- Select a respected community member to interview on their views of the topic.

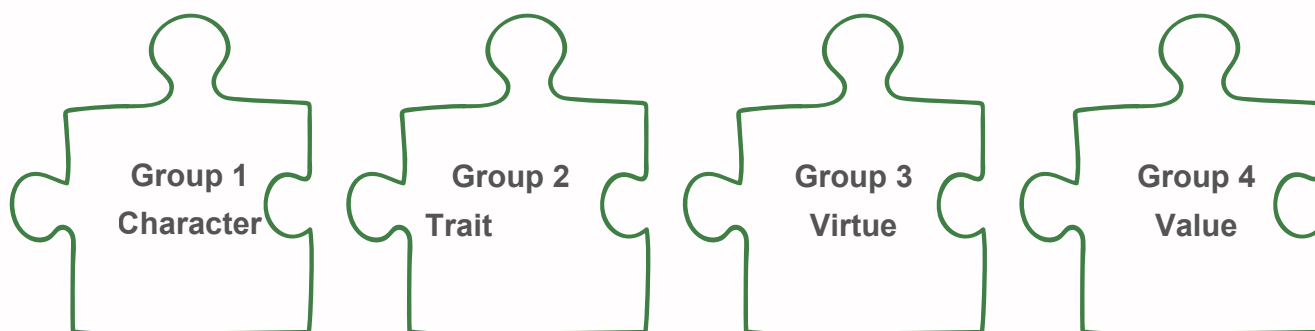
LESSON 2: CHARACTER, TRAITS, VIRTUES & VALUES

13 CLIMATE ACTION



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:

Own words definition:

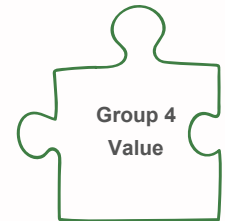
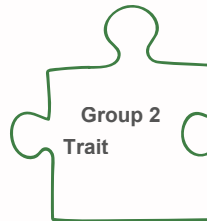
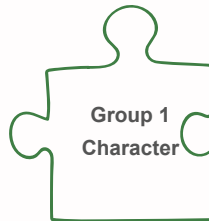
LESSON 2: CHARACTER, TRAITS, VIRTUES & VALUES

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

LESSON 2: CHARACTER, TRAITS, VIRTUES & VALUES

13 CLIMATE ACTION



What are Character, Traits, Virtues & Values?

Idea storming Space



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

1. _____
2. _____
3. _____

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

SDG 13 Passion to Purpose

Climate Action and Sustainable Development



Passion to Purpose

Climate Action & Sustainable Development

Action Project

Lesson 3: Introduction to Design Thinking

Lesson Title and Summary: Introduction to Design Thinking?

Design thinking is the cognitive, strategic and practical process for creative problem-solving.

This lesson will introduce learners to the five stages of design thinking to build a foundational understanding of the process. Design Thinking helps the learners to understand that they can create their own future by enabling them to design their own experiences and participation.

Vocabulary:

Context, Culture, Empathy, Stakeholders, Users;

In this lesson, the learner will:

- be introduced to design thinking
- explore the 5 stages of design thinking
- create their own understanding of the stages through quick practical tasks
- work as pairs and individuals to begin to understand the iterative processes
- practice time management

Materials

- Flipped Classroom: Wicked Problems
- Worksheet: Introduction to Design Thinking
- Worksheet: Stakeholder Mapping
- Internet Access
- Paper and pens / markers

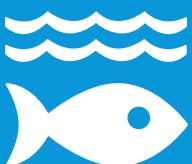
4 QUALITY EDUCATION



11 SUSTAINABLE CITIES AND COMMUNITIES



14 LIFE BELOW WATER



15 LIFE ON LAND



SDG13 Passion to Purpose

Lesson 3: Introduction to Design Thinking



Activity Instructions

If working digitally, ask learners to go to the worksheet: Introduction to Design Thinking in the learner's' download of this module. Alternatively, this can also be projected or if necessary you can also circulate handouts and ask learners to keep all their work in a folder. This can be assessed at the end of the module, if you are undertaking assessments.

Activity 1 Stages of Design Thinking, Empathise & Define (20 mins)

1. In Activity 1, learners should complete the worksheet up to the section titled - Define.
2. Begin by watching the short video in the Worksheet: Introduction to Design Thinking and ask learners to work in pairs to find the meanings of the words and summarise them in their own words.
3. Complete the 'Empathise' and 'Define' sections of the worksheet in pairs and then review meanings and ideas as a whole group.
4. Have each pair share their meanings with the class, photograph each group's answers and use this to create a 'group' design thinking vocabulary list / glossary.

Activity 2 Stages of Design Thinking, Ideate, Prototype & Test (30 mins)

1. Allow learners 30 minutes to complete the Ideate and Prototype task of the Worksheet: Introduction to Design Thinking in pairs.
2. Remind them that they will have to manage their time to allow for the prototyping and testing stage.
3. The aim is not to create masterpieces but to work quickly and experimentally – it should be made clear that given the limitations, the purpose is to show how it's important to quickly and cheaply*.

* Explain to learners the purpose of prototyping is to enable feedback and input to their ideas as a user's needs or a client's desires can change a design radically and it's important to not waste time and money during the early stages of design.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Rather than post-its, this activity can be undertaken using a mentimeter poll www.mentimeter.com

SDG13 Passion to Purpose

Lesson 3: Introduction to Design Thinking



EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, divide the lesson in half. Complete Activity 1 in the first lesson and Activity 2 in the following lesson.

Extension: For a longer class, complete Worksheet: Wicked Problems or alternatively, ask learners to complete the Flipped Classroom worksheet before the next lesson. This will help them understand the need for systemic approaches to challenges and is the context underpinning the Passion to Purpose module.

Option B: Learners begin to work through the worksheet: Stakeholder mapping to begin to understand passionate / purposeful projects in a larger context

MEDIA BOX: (online video links, extra resources, case studies etc)

Video: 'What Is Design Thinking?' Sean VanGenderen [1:50 min]

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

Video: 'The Design Thinking Process' Sprouts [3:56 min]

https://www.youtube.com/watch?v=_r0VX-aU_T8

Document: Design thinking Mindsets in School

<https://drive.google.com/file/d/0B9jWVYCVFZu6RWFSem1TYIjeEU/view>

Website: Introduction to SDGs for Young People <https://www.un.org/sustainabledevelopment/youth/>

Local Trip / Expertise / Additional Work and Assessments

Worksheet: Stakeholder Mapping supports students to focus on their local place, its issues and its audience. This can be revisited later in the programme to help them once they have a clear for their project

Educators are encouraged to work with colleagues to develop the project through multiple outcomes See Media Communication and SDG 4 Supporting Skills muinincatalyst.com



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 -

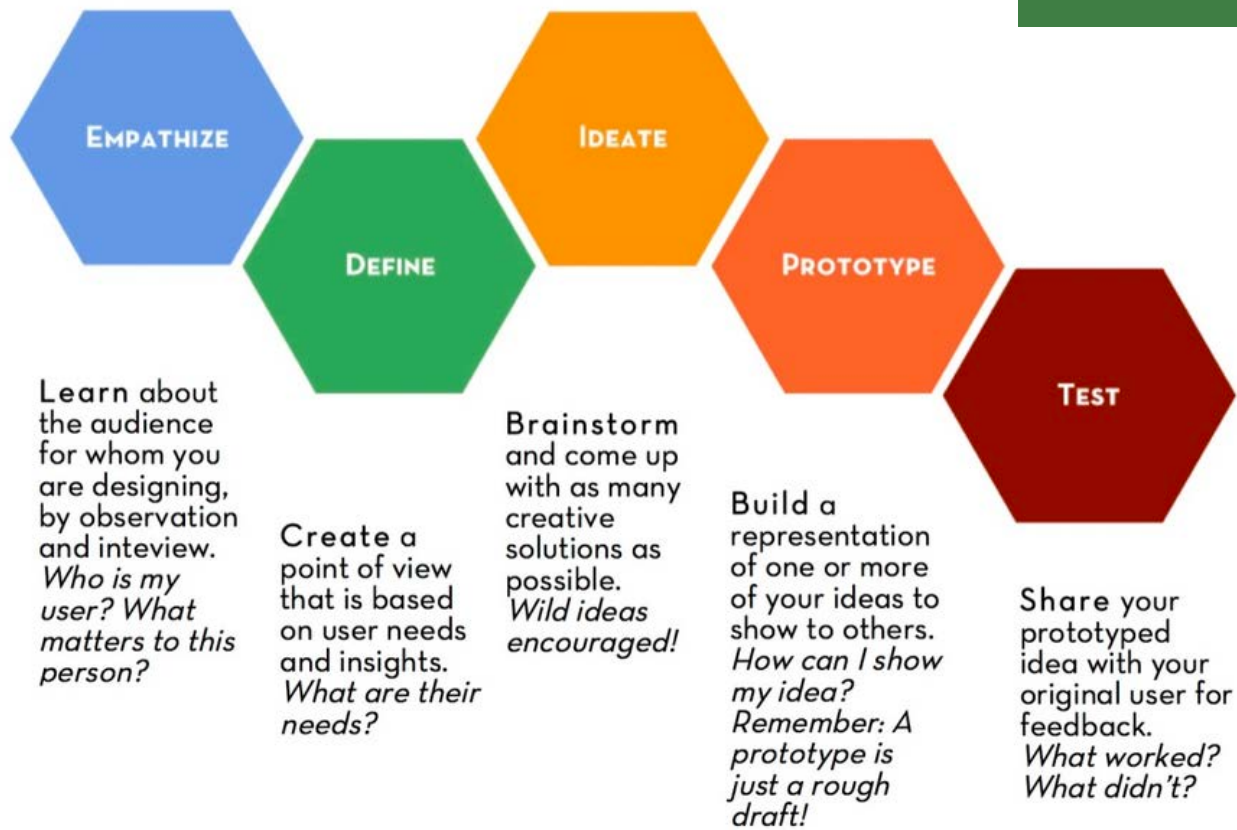
Empathy-

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.

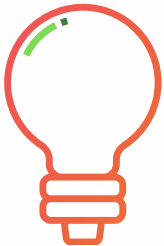


Define - What's your problem? `Often we deal with symptoms - a runny nose, a sore throat, but we need to deal with our immune system. In defining your problem you will look at the whole system. Write down three problems you know of in your community or the world.

- 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.

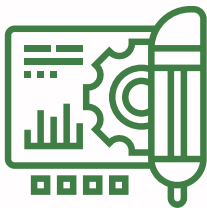
Good Ideas

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

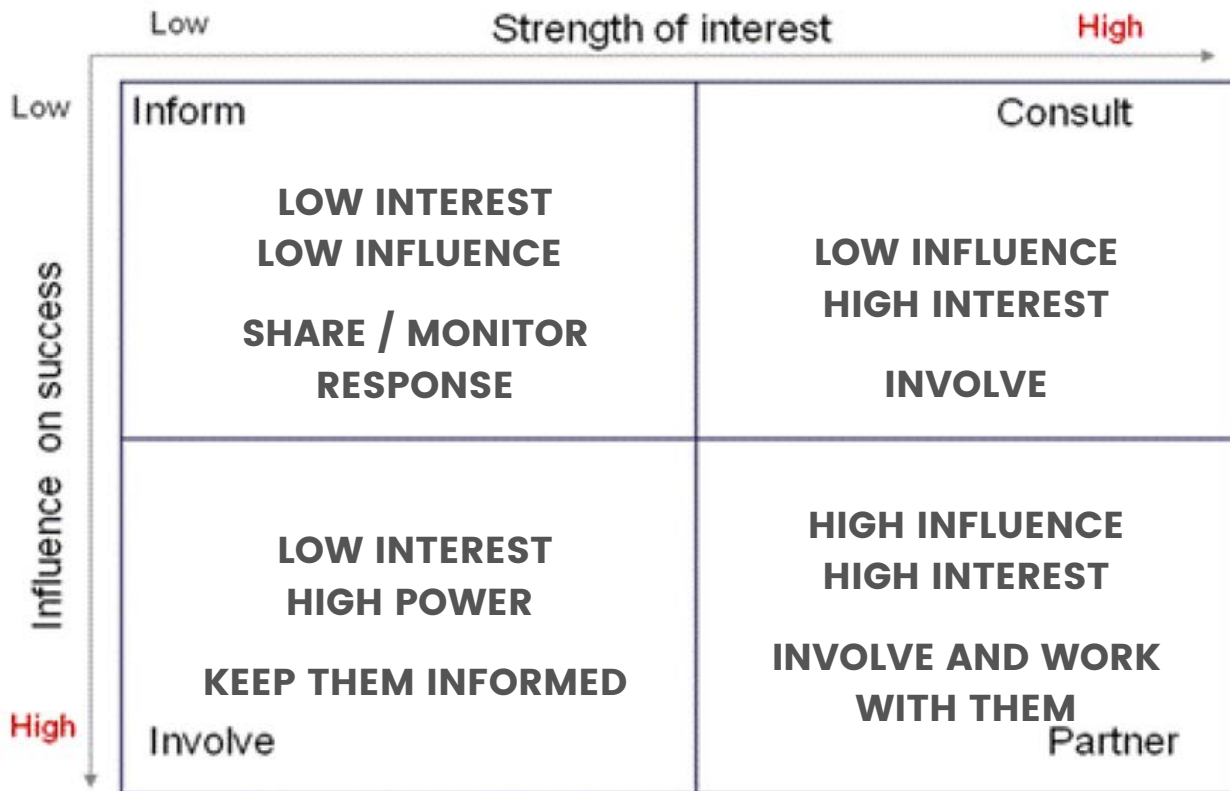
L3 WSB: STAKEHOLDER MAPPING

13 CLIMATE ACTION



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..

SDG 13 Passion to Purpose

Climate Action and Sustainable Development



Passion to Purpose

Climate Action & Sustainable Development

Action Project

Lesson 4: Defining the Problem

Lesson Title and Summary: Defining the Problem

In this lesson, students will begin to understand how to define a problem. Students are asked to begin to identify the aspects of a problem at a local and global level.

Learners will identify and research key aspects of a local problem and begin to develop their project. Learners will have the opportunity to connect and develop awareness of their local context and any concerns.

Vocabulary:

Assumptions; (Biases, Judgement) Analyse, Conflicts, Define, Identify, Problem

In this lesson, the learner will:

- understand the importance of getting to the source of a problem
- develop an awareness of how to localise the SDGs
- develop an understanding of the connection of local and global issues
- develop an understanding of the complexity of wicked problems in their location
- develop critical thinking about problem solving

Materials

- Worksheet: Step into the Problem
- Worksheet: Using a Problem Tree
- Teacher's Notes: Using a Problem Tree
- Local newspapers / internet access

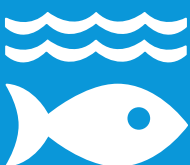
4 QUALITY EDUCATION



11 SUSTAINABLE CITIES AND COMMUNITIES



14 LIFE BELOW WATER



15 LIFE ON LAND



SDG13 Passion to Purpose

Lesson 4: Defining the Problem



Activity Instructions

Activity 1 Finding and defining your local problem, issue or concern (25 mins)

1. Organise learners into pairs.
2. Ask pairs to spend 10 minutes searching online / hard copy versions of local newspapers for articles that indicate local problems, issues, and concerns.
3. Using Worksheet: Step into the Problem, pairs need to narrow down their focus to a maximum of three local problems, issues or concerns.
4. Then, they need to consider how each may affect local people and communities and then think of possible solutions. Bullet points and flash ideas are fine at this stage.

Activity 2 Using a Problem Tree (25 mins)

1. Using Worksheet: Using a Problem Tree, pairs can select one of the local problems they found in Activity 1 to focus on in more detail.
2. Learners are guided through analysing the problem from impact, to cause and effect and then planning out a potential solution. See Teachers Notes: Using a Problem Tree for support in facilitating this activity.
3. Remind learners they may not have all the answers at this point, so to make notes of any assumptions, questions, conflicts, or gaps in knowledge.
4. Share their Problem Trees either in small groups or as a whole class.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Rather than post-its you can set up a mentimeter poll to gather reflections - www.mentimeter.com

SDG13 Passion to Purpose

Lesson 4: Defining the Problem



EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, complete Activity 1 only. Move on to Activity 2 in a following lesson.

Extension: For a longer lesson, spend more time sharing the highlighted problems and solutions on the Problem Tree worksheet. Learners can begin to research the local organisations and stakeholders involved in their specific problem and make connections with them. They may be able to collaborate when they come to develop their service, system or product in response to the local problem.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

- Video: Define [4:34min] <https://www.youtube.com/watch?v=TNAdanuvwtc>
- Video: 'Defining the Problem' [1:25min] <https://www.youtube.com/watch?v=2rJRVv-NOaA>
- Video: 'What is a Problem Statement' [2:54min] https://www.youtube.com/watch?v=eazp_yt4kDA
- Website: Sustaining Development SDG 12 <https://sustainingdevelopment.com/sdg12-indicators/>

Local Trip / Expertise / Additional Work and Assessments

Contact local Public Participation Network (PPN), to connect with local groups to begin to work with local organisations' problems.

<https://www.gov.ie/en/service/ea07c-find-your-local-public-participation-network/>

Reconnect with any values-led organisations they may have connected with in Lesson 6.

Revisit stakeholder mapping worksheet and undertake the activities focused on their own project or selected problem.



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

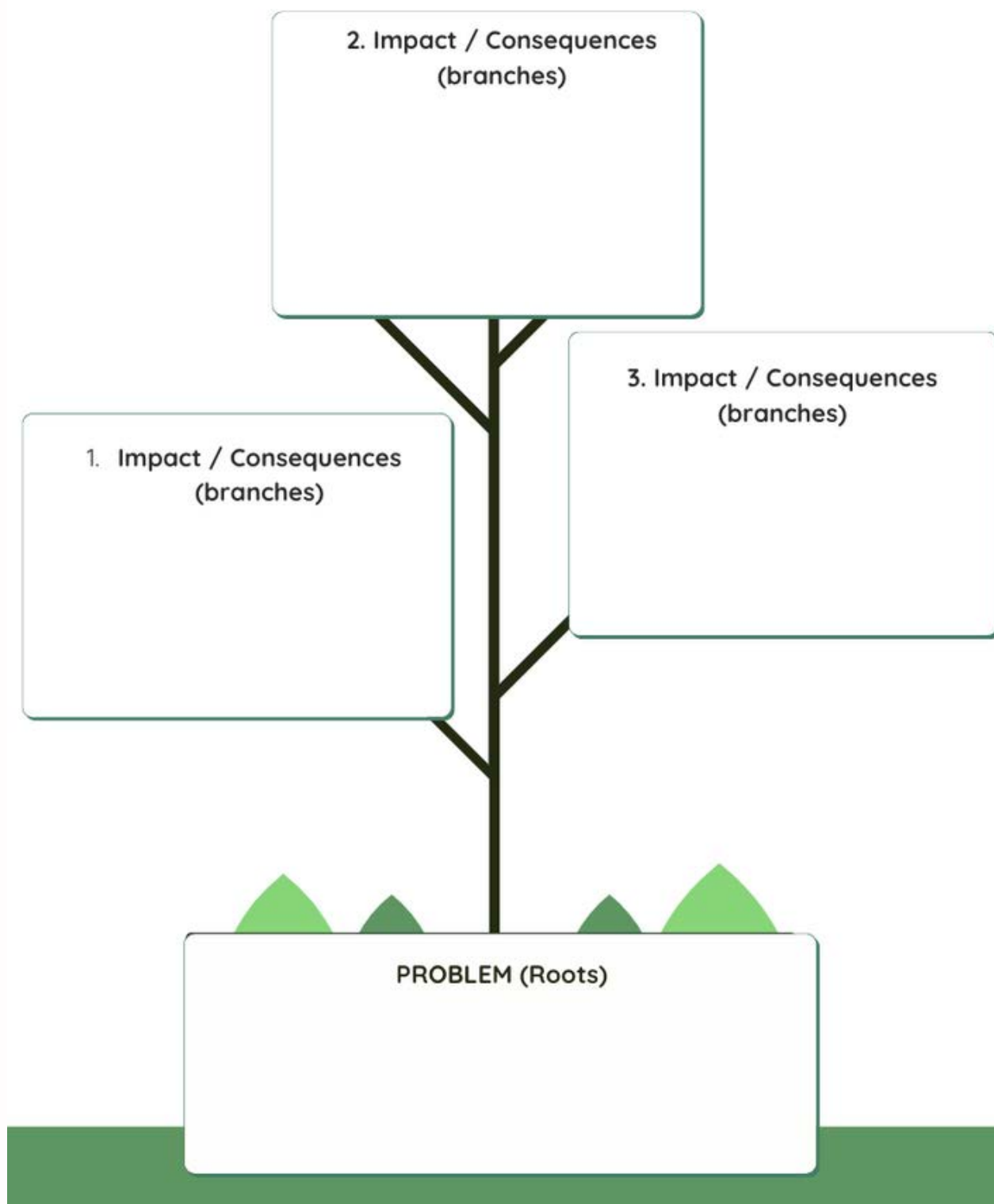
13 CLIMATE ACTION



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:

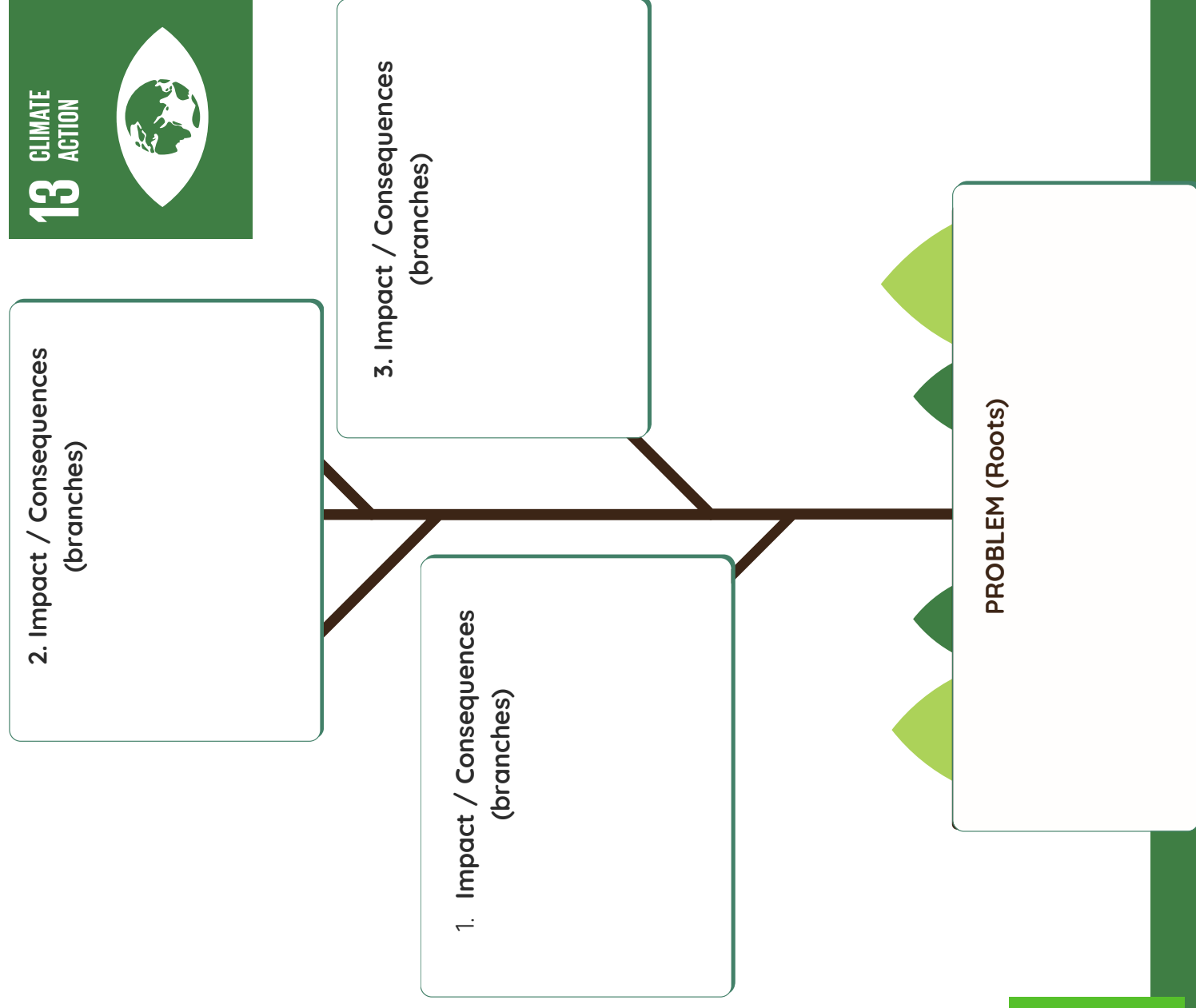
● What's the Problem - C ● Empathy C, Step into the problem ● Possible ideas / Solutions:

Name: _____

Date: _____

LESSON 4: USING A PROBLEM TREE

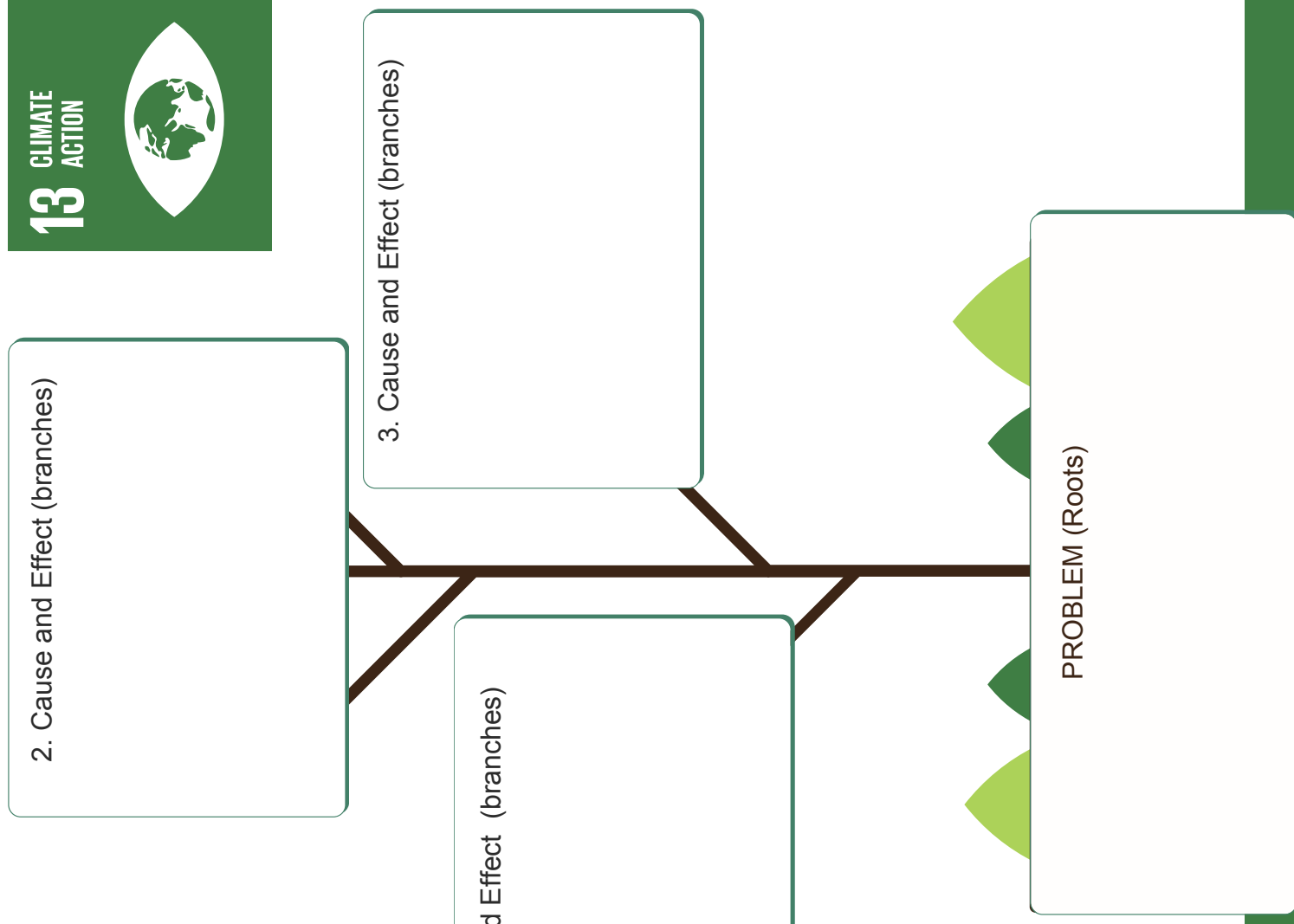
In each of the 'branches' try to write down - the impact / consequences that might arise due to the problem you have identified.



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



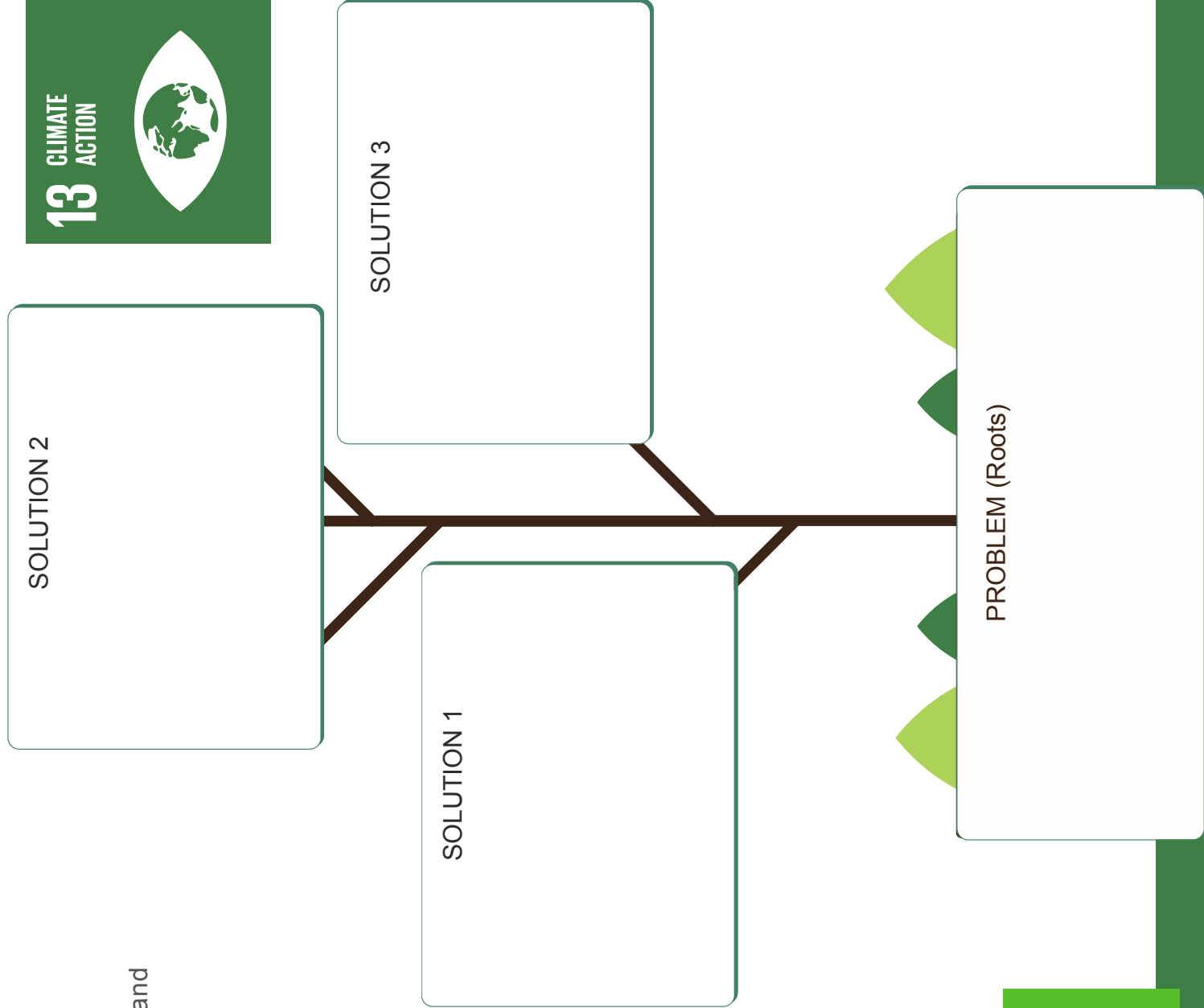
15
LIFE
ON LAND



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 _____



SDG 13 Passion to Purpose

Climate Action and Sustainable Development



Passion to Purpose

Climate Action & Sustainable Development

Action Project

Lesson 5: Empathy

Lesson Title and Summary: Empathy

Stanford Design School's five chairs exercise encourages learners to learn how to develop design principles for a user profile. Learners will consider user needs (this sets the design principles) and develop ideas on paper and create 3D prototypes of their designs. This activity encourages learners to iterate on their designs and practice using different materials.

Vocabulary:

Assumptions; (Biases, Judgement) Design Principles, Empathy, Identify, Immersion.

In this lesson, the learner will:

- understand empathy in design
- develop critical thinking
- build, test and iterate design ideas grounded in a user's needs
- practice group work
- work through design challenges collaboratively

Materials

- Worksheet: User Profiles
- Worksheet: Empathy Map
- Paper
- Scissors
- Crafting Materials 3D prototyping e.g. cardboard, tape, modelling clay, match sticks, toothpicks, lollipop sticks
- Tape / Glue



SDG 13 Passion to Purpose

Lesson 5: Empathy



Activity Instructions

Activity 1 Developing design principles from user profiles (10 mins)

1. Divide learners into groups of 2-4 and give each group Worksheet: User Profiles.
2. Learners will read through the profiles in their groups and underline key information on each user.

Activity 2 Developing paper designs (15 mins)

1. Ask each group to select a user from the worksheet they want to design for and identify two needs (design principles) they see in the description.
2. Use Worksheet: Empathy Map to have a discussion and note-taking session in groups on the selected user.
 - Did you identify the design principles required for your user?
 - Did you make any assumptions about your user?
 - Did you discover any biases / judgments about your user that you might have?
3. Based on the discussion, design a chair for their selected user on paper.

Activity 3 Develop a 3D prototype (25 mins)

1. Using the paper design as an initial guide, build a 3D prototype using the materials provided. Make sure to include at least two design principles (user needs) into the prototype.
2. Encourage groups to add one more design principle - to reflect their own style as designers.

This lesson is a foundational skills-building lesson. The process can be transferred to any project as part of an empathic design process. Using the empathy map - See additional activity in the extension box, which can extend this key skill.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Rather than Post-its you can set up a mentimeter poll to gather feedback www.mentimeter.com

SDG 13 Passion to Purpose

Lesson 5: Empathy



EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, complete Activity 1 & 2 only. Complete Activity 3 in the following lesson.

Extension: For a longer class, develop a discussion task after Activity 3 using the following prompts. These prompts can also be used as an out-of-class reflective writing task.

- What was it like to build your chairs using the design principles you identified?
- What was it like to create different iterations of your design?
- What did you change along the way? What did you learn from your prototypes?
- Did anyone get stuck at any point? What was that like? What did you do to get unstuck?
- Which material did you enjoy working with the most? Why?
- Which material did you like the least? Why?
- Which material best expresses the essence of the chair your drew?

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Video: The importance of Empathy [3:30 mins] <https://www.youtube.com/watch?v=UzPMMSKfKZQ>

Video: Empathy not Sympathy [2:30 mins] <https://www.youtube.com/watch?v=HznVuCVQd10>

Video: What is an Empathy Map? [5:36 mins] <https://www.youtube.com/watch?v=QwF9a56WFWA>

Local Trip / Expertise / Additional Work and Assessments

Learners identify a local values-led organisation and make contact to request an interview and prepare interview questions about the values of their chosen organisation.

Linked learning:

Supporting Skills: Interview skills

Media Communication module to develop a media project task.

Lesson 5: Empathy Map

Understanding Your User

What does your user think and feel?

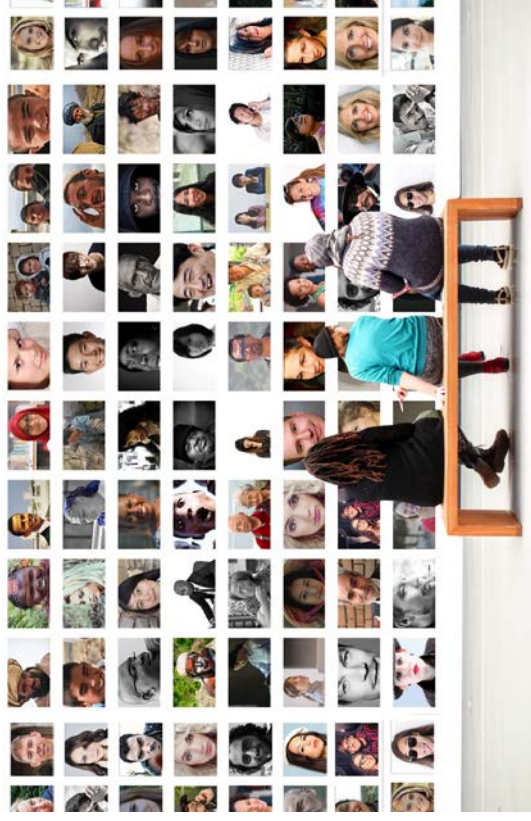
- What really matters to them?
- What do they think about?
- What are their worries, dreams or aspirations?

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?

13 CLIMATE ACTION

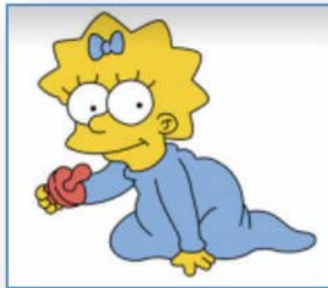


LESSON 5: USER PROFILES

13 CLIMATE ACTION



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

SDG 13 Passion to Purpose

Climate Action and Sustainable Development



Lesson Title and Summary: Generating Ideas + Remix & Improve

This lesson enables learners to develop an understanding of the process of generating ideas starting with their personal experience to help them build skills for personal project ideas. Learners develop an understanding of the importance of developing ideas and looking for opportunities to iterate and improve on existing ideas. Learners are also introduced to open source concepts, e.g. iteration and collaboration.

Passion to Purpose

Climate Action & Sustainable Development

Action Project

Lesson 6: Generating Ideas + Remix & Improve

Vocabulary:

Agility, Creativity, Disruptive, Innovation, Enterprise, Problem Finding and Solving

In this lesson, the learner will:

- explore their own experience as a source of ideas
- feel comfortable with exploring experimental approaches
- develop skills around idea generation
- accommodate variables and limits into design processes
- learn to transfer and apply skills

Materials

- Worksheet: Ideate Remix 1
- Extension Task: Remix 2
- Pens, pencils
- Paper



SDG 13 Passion to Purpose

Lesson 6: Generating Ideas + Remix & Improve



Activity Instructions

Activity 1 Remixing ideas – Rapid Response (20 mins)

1. Using Worksheet: Ideate Remix 1, ask learners to complete the first row based on their own preferences.
2. Organise learners into pairs to share what they have filled in. Pairs can be assigned randomly or spend some time with a whole class share to pair partners up who have the same hobby filled out.
3. While learners are sharing their ideas in pairs, draw the grid template on the board- Hobby, Likes, Obstacles, Change (2-3 rows).
4. Ask the class for input from the grid randomly e.g. "Group one tell me what's written in the second column, row 2." Write their answer on the board. Repeat three more times until you have something on the board from each of the columns, e.g. group 4 tell me what's written in the column 3, row 1, group 2 tell me what's in column 4, row 2, group 3 tell me what's in the column 2 row 3.
5. Now you have a completed grid with mixed ideas from the class.

Activity 2 Remixing ideas Rapid Response 2 (20 mins)

1. Using the remixed grid on the board, ask pairs to start coming up with possibilities for a business, activity or service that include the 4 variables; the more random the variables, the better to push their creativity.
2. Give pairs 10 minutes to brainstorm ideas and then share as a whole class or smaller groups.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Rather than post-its you can set up a mentimeter poll to gather reflections - www.mentimeter.com

SDG 13 Passion to Purpose

Lesson 6: Generating Ideas + Remix & Improve



EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, complete Activity 1 only, extending the timing of the steps. Complete Activity 2 in a following lessons.

Extension: For a longer class, use the work in Activity 2 with Worksheet: Remix 2. Ask the class to undertake the same process for the Idea Remix using one of the businesses, services or Activity 1 ideas that has come out of the first part of the lesson. Learners can begin to develop an empathy map for a user of the ideas, products or service that have come out of Activity 1.

This can be extended to explore multiple ideas and help them select which has the best 'fit' between users needs and their purpose. Learners can also integrate learning from DT 1 Empathy by using the Step into the Problem worksheet to work through the ideas generated.

They can also undertake a standard SWOT analysis once they have selected their final project idea

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Video: Design Thinking: Ideate (4:04 mins) <https://www.youtube.com/watch?v=zbLxs6te5to>

Website: Sustaining Development SDG 12 <https://sustainingdevelopment.com/sdg12-indicators/>

Local Trip / Expertise / Additional Work and Assessments

Continue to research the local organisations and stakeholders involved in their selected problem and make connections with them to consider the development of their service or product in response to the local problems.

Reconnect with any values-led organisations they may have connected with in Lesson 6.

Revisit their stakeholder mapping worksheet and undertake the activities focused on their own project or selected problem.



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

SDG 13 Passion to Purpose

Climate Action and Sustainable Development



Passion to Purpose

Climate Action & Sustainable Development

Action Project

Lesson 7: Prototyping and Pitching Your Ideas

Lesson Title and Summary: Prototyping and Pitching Your Ideas

In this lessons, learners will begin to consider their ideas for their prototype, develop a concept statement and look at ways to prototype their ideas.

They will also develop their designs on paper using their user profiles and proposed ideas. They will begin to prepare materials and ideas for their vision board.

Vocabulary:

Concept Statement, Enterprise, Innovation, Prototype

In this lesson, the learner will:

- explore how to evolve ideas
- iterate their ideas
- develop a concept statement
- explore prototyping methods using paper and card
- develop prototyping skills

Materials

- Worksheet: RSB Rapid Response Prototyping
- Worksheet: Concept Statement
- Video: 'Design Thinking - Prototype' [4:54min]
- Pens, pencils
- Paper and card
- Internet Access



SDG 13 Passion to Purpose

Lesson 7: Prototyping and Pitching Your Ideas



Activity Instructions

Activity 1 Prototyping – Rapid Response (10 mins)

1. Watch Video: 'Design Thinking: Prototyping' [4:54min]- see Media Box.
2. Make notes on the benefits of prototyping, discuss with a partner and then share as a whole class.

Activity 2 - Creating a Concept Map (20 mins)

1. Review Worksheet: Concept Statement to ensure task understanding.
2. Ask learners to complete a concept statement for their project idea.
 - *Learners focus on their idea and its selected problem area. Using their empathy maps the learners will create a concept statement. It is important that learners document this process as they will use images in their vision board (lessons 12 / 13 and Pecha Kucha lessons 14 - 16).*

Activity 3 - Developing your Prototype (20 mins)

1. Ask learners to complete page 1 of Worksheet: Rapid Response Prototyping.
2. Ask learners to begin developing their designs on paper for their ideas and prototype using their concept statements.

Activity 4 Developing your Prototype (time flexible)

1. Using pages 2 - 4 of Worksheet: Rapid Response Prototyping, ask learners to complete one of each of the elements of construction.

Activity 5 Completing your Prototype (time flexible)

1. Use this lesson to begin paper prototypes. This can then be extended across a number of lessons to complete a more substantial 3D prototype.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Use Post-its or a mentimeter survey - www.mentimeter.com - to gather reflections

SDG 13 Passion to Purpose

Lesson 7: Prototyping and Pitching Your Ideas



EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, divide the tasks across more lessons or set some of the worksheet tasks as Flipped Classroom tasks.

Extension: For a longer class, extend the prototyping tasks to begin the work on their 3D prototype.

Additional Class: Learners can also take part in a Ready Steady Design challenge - see the video in the Media Box and RSB Rapid Response Prototyping worksheet.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Video: Design Thinking: Prototyping (4:54mins) <https://www.youtube.com/watch?v=Q4MzT2MEDHA>

Video: What is a Prototype? (4:11mins) <https://www.youtube.com/watch?v=4XengN5lb9o>

Video: Paper Prototyping (2:36min) <https://www.youtube.com/watch?v=85muhAaySps>

Video: Rapid Prototyping (7:31min) <https://www.youtube.com/watch?v=JMjozqJS44M>

Video: Ready Steady Design (3:26min)
https://www.youtube.com/watch?v=jlXSuZg2awA&feature=emb_logo

Local Trip / Expertise / Additional Work and Assessments

Research iForm, National Research Centre in Advanced Manufacturing at University College Dublin - <https://www.i-form.ie>. Arrange a meeting or presentation with their community engagement and education team about rapid prototyping <https://www.i-form.ie/communityengagement/overview/>

3D printing training for teachers <https://www.iform.ie/communityengagement/3dprintingforteachers/>

Arrange a visit or meeting with a local engineering company or one of the net manufacturing companies to find out more about product design and their prototyping process.



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?

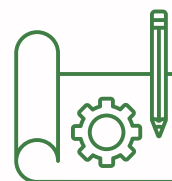
e) If you ideate, prototype and test too early - what are three mistakes that can be made?

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.



LESSON 7WSA: RAPID RESPONSE PROTOTYPING

13 CLIMATE ACTION



READY, STEADY, BUILD: KNOWLEDGE GATHERING

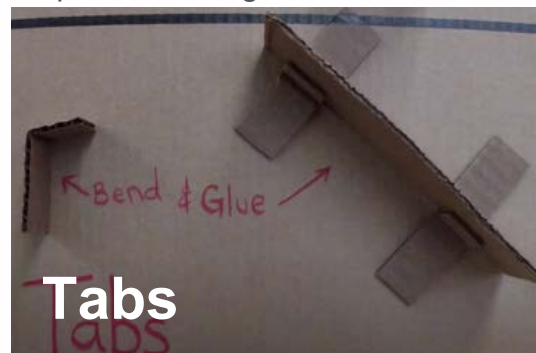
Today we are going to experiment with rapid prototyping with materials that we have at hand. You will explore three basic elements - useful for rapid prototyping:

- Structure
- Fastening / Joining
- Surface

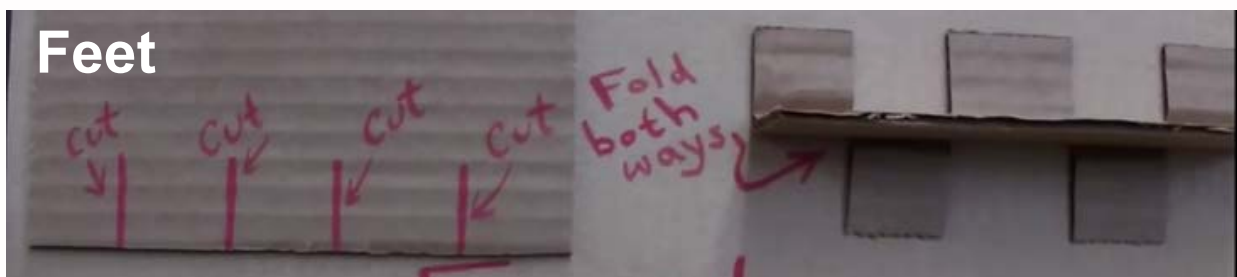
1. Structure - this will provide support and form to your prototype. The structure provides strength by load-bearing if re-enforced or solid, e.g. columns or supports for covering or other materials, e.g. tent poles. Here's some simple tips for creating structure.



Flange



Tabs



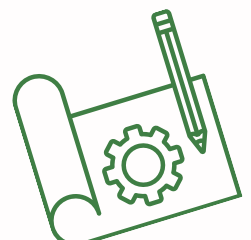
Feet



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

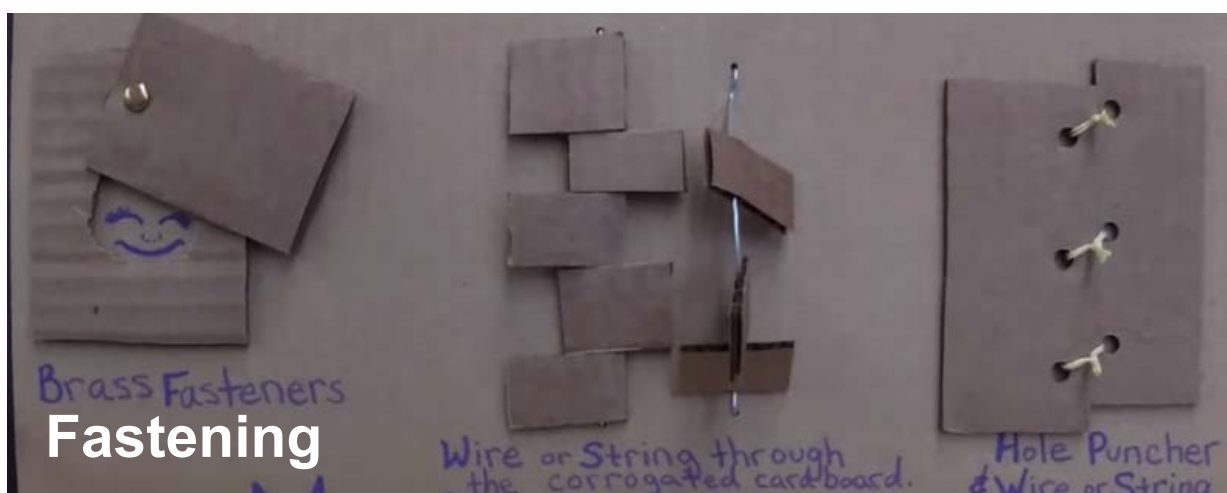
13 CLIMATE ACTION



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

