

SDG 14 Future of the Ocean

MM4: Problem to Pitch Marine Plastic Waste



Micro-Module 6: Problem to Pitch Marine Plastic Waste

Implementation

Lesson 1: What is Design Thinking?

Subjects: Climate Action and Sustainable Development, English, Design and Communication Graphics, Design and Technology, Maths, Science

Lesson Title and Summary: What is Design Thinking?

Design Thinking is the cognitive, strategic and practical processes for creative problem solving. This lesson will introduce students to the 5 stages of Design Thinking to build a foundational understanding of the process.

Vocabulary: Complexity, Context, Design Thinking, Empathy, Place-based, Qualitative; 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

- Worksheet: Introduction to Design
- Thinking Worksheet A4 paper
- Internet access
- Worksheet: Lesson 1 Flipped Classroom
- Worksheet: Stakeholder mapping activity



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L1: Introduction to Design Thinking



Activity Instructions

Activity 1 - Introduction to Design Thinking (25mins)

- 1) If working digitally, share the worksheet. This can also be projected. You can also circulate handouts and ask them to keep all their work in a folder to be assessed at the end of the module. The first activity completes the worksheet up to the section on Define.
- 2) Watch the short video on Design Thinking Introduction worksheet, then have students work in pairs to find the meanings of the words and re-write them in their own words.
- 3) 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.
- 4) As a class, discuss the 5 stages of Design Thinking image – reviewing any terms that are new.

Activity 2 – Ideate - Worst Idea - Good Idea / Bad Idea – (30 mins)

- 1) Allow students 30 minutes to complete the Ideate and Prototype task of the worksheet in pairs.
- 2) Remind them that they will have to manage their time to allow for the prototyping and testing stage. The aim is not to create masterpieces but to work quickly and experimentally – it should be made clear that given the limitations, it's just to quickly show the idea in 3D.

Flipped Classroom: Have students complete the Flipped Classroom worksheet before the next lesson. This can be used as a discussion activity beginning the next lesson.

REFLECTIVE EXERCISE: 3-2-1

- 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

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EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter class, remove activity 2 and spend more time building the collective vocabulary list – have each student type up their words and definitions and add to a shared document.

Extension: For a longer class, give students more time and materials for the Ideate – Prototype stages of Design Thinking in the worksheet.

Option B: Begin the Flipped classroom worksheet in class to complete at home.

If students have project ideas in mind they could also begin to research their stake holders and local organisations through the stakeholder mapping worksheets – see media box.

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

- Worksheet: Design Thinking: Introduction To Design Thinking
- Flipped classroom worksheet - introduction to complexity
- Applying Design Thinking in Schools poster - <https://www.makersempire.com/design-thinking-for-schools-poster/>

To focus on SDG 14: Use SDG 14 Problem to Pitch Marine Plastic Waste lesson plans and worksheets and the SDG 14 Ocean Literacy micro-module

- Generic SDG Focus: See Introduction to Sustainable Development Goals lessons
- Introduction to SDGs for Young People <https://www.un.org/sustainabledevelopment/youth>
- Explore the SDGs <https://sdgs.un.org/>

Local Trip / Expertise / Additional Work and Assessments

Stakeholder Mapping worksheet (lesson 3) supports students to focus on their local place, its issues and its audience.

Linked learning: Media Communication 1-4 micro-module to support the development of the 4Cs skills – Creativity, Communication, Critical Thinking and Collaboration.

Tutors are encouraged to work with other tutors to develop the project through multiple outcomes such as video, poster, Pecha Kucha, Interviews or Podcasts and SDG 4 supporting Skills - reports.

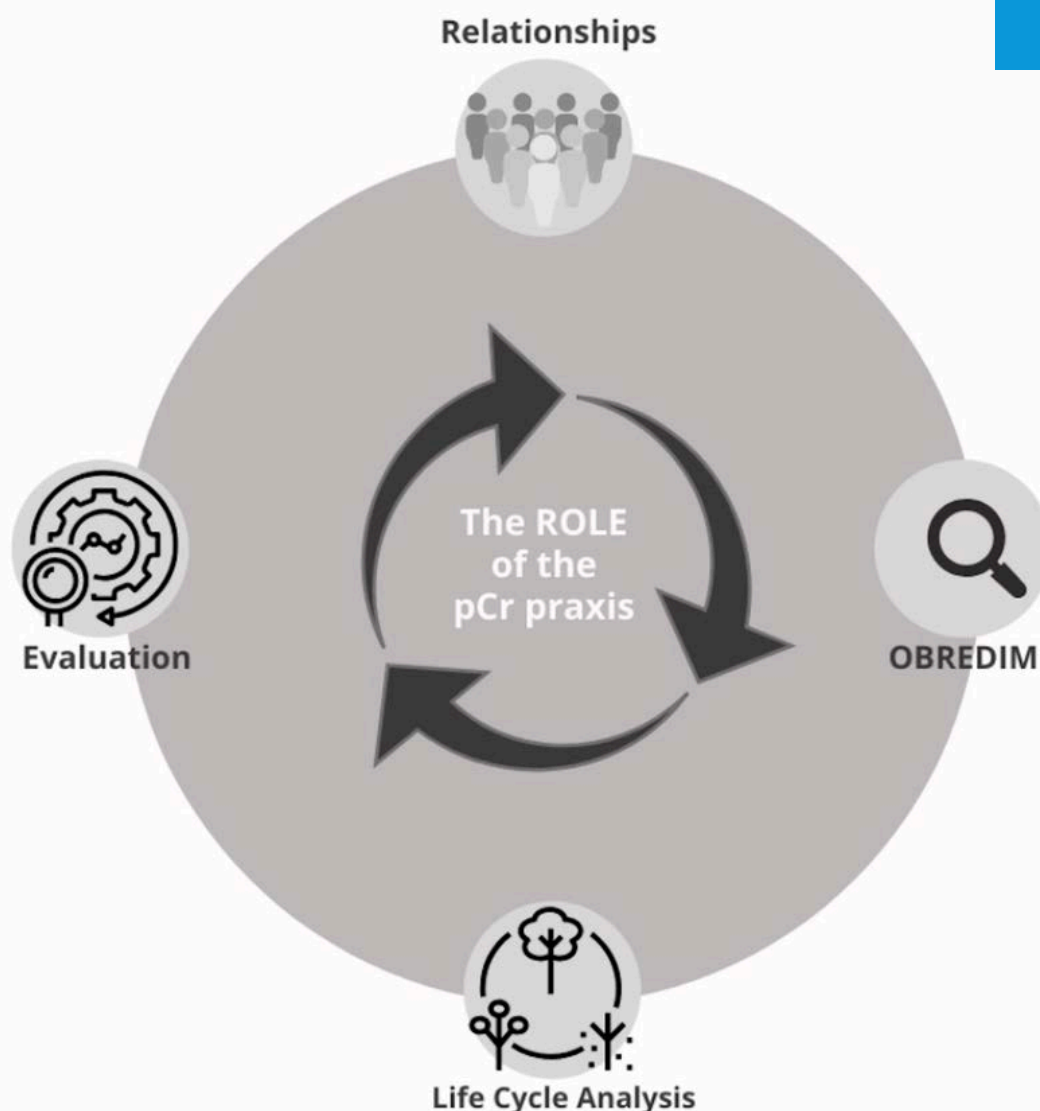









Fig.1 The ROLE of the pCr praxis, McKeown 2016

R – Relationships - Using an intensive audit tool to map cultural, economic, sociopolitical and environmental dynamics, the pCr praxis reveals relationships, resources and opportunities to help re-configure and re-imagine an understanding of place. Stakeholder consultation is the first stage in the process. The construction of flexible micro-ecologies aids the revelation of multiple knowledge cultures and entities, integrating their place-based knowledge, valued for its potential to contribute to a local resilience.

O - The OBREDIM process log is a 3-phase tool that deepens the pCr audit undertaken in advance of developing any project or intervention. The first step in the pCr process is to map the skills, activities and resources of the community using the OBREDIM log; what they already do and how this might contribute to sustainable development and community resilience. This develops the ability to see the localised system, strengths and weaknesses gaps or bridges that can be built upon. Only then will interventions be created, partnerships brokered and projects developed, seeding the praxis, adapting and iterating it as necessary.



OBREDIM AUDIT		Activity:	Date:
Audit Phase		Details reference: What to look for and record.	
	O – Observation Phase 1	Survey all local 'organisms' e.g. organisations, stakeholders, businesses, arts and cultural orgs, community groups, charities, people, animals, vegetation, socio-cultural landscape, history, news / media, politics. Try to create as full a picture of the residency ecosystem. Ways and things to observe: Patterns of growth, distribution, town layout business layout etc. Traffic flow, people motion, dead spots, flow of information, traffic people, the dynamics; social, cultural physical. Is there an impact? Does it last? Where's it start and stop. Natural system aspects: Weather, Sun, Water sheds, air, flora fauna animals, migration routes or diversions of water, desertification, forest, History – what's changed and why is there a pattern, does this have impact on the future? Communities, connections and relationships, distance/ proximity, inter-species, inter generational. What is successful? What has adapted are there any common traits? Are there any recognisable patterns, numerical patterns? Are their functions of these patterns? Look at textures / shapes – Draw them, photograph them, record audio, video. Use the senses; What can you see, hear, taste, smell and touch.	
	B –Boundaries	The edges / limits of the ecosystem; the location's geo boundaries, organisational boundaries, people's responsibilities, shared values, cross-over of aims, power dynamics. Limits to growth expansion, Laws, regulations and policies. Where do things stop and start? Are there diversity, tensions and encounters? Is there a difference between the edges and centre? Zoning analysis: This can highlight responsibilities, existing partnerships, focus for effort.	
	R - Resources	Physical and non-physical resources; Time, money, services, skills and knowledge, existing networks and partnerships, groups, what already exists and how it works (or doesn't). Sample Questions: Venues: what's there, what does it do, how does it function, who sponsors events. Groups: who's doing what, when and with who?	
	E – Evaluation Phase 2	Begin to map a web of relations – using the info from Phase 1 and the Zoning analysis. Evaluate what exists and where the gaps are – how does info flow, notice relationships and communication. Include a SWOT / SMARTER analysis	
	D - Design	Design on paper. Becomes a map for the implementation stage or if there's an existing project in mind re-design in light of information gathered in Phase 1 and evaluation stage.	
	I – Implementation Phase 3	Implementing design: incl logistics eg timelines, production milestones, communication, fundraising, skills needed.	
	M - Maintenance	Maintaining the project and any maintenance needs or opportunities to evolve the project, handing over passwords, admin details, resource directory – anything needed to move the project forward or maintain its existence and evolve it	



L - Lifecycle Analysis.

The pCr framework offers a simple visual tool that embeds an eco-social commitment by addressing the full life cycle of a project and beyond.



inputs



processes



outputs

By plotting the position of the inputs, processes and outputs across Zones 1 - 5 of a project against the proximity to project's 'Zone 0', an initial assessment of all production process can be considered.



E – Evaluation.

The pCr toolkit includes an evaluative matrix, The pCr Vital Signs Matrix, based on the concept of the vital signs of a project and contributing to the vital signs of a place (McKeown, 2015). The vital signs act as indicators of a healthy human and non-human system.

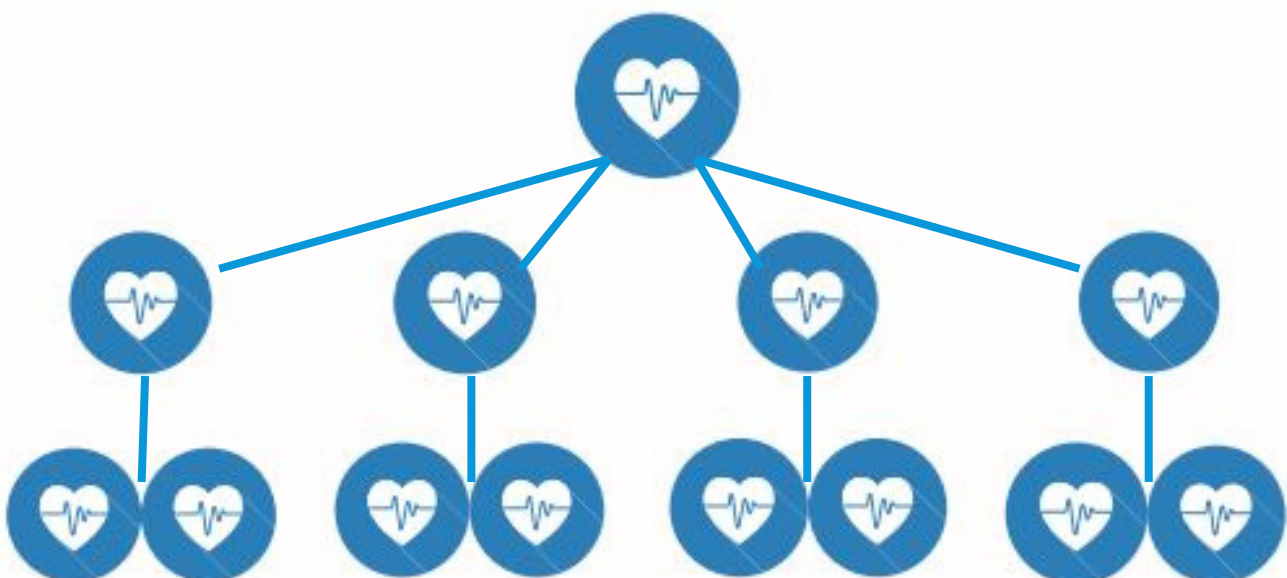


MM6: LITG ROLE OF THE PCR METHOD

The pCr Vital Signs Matrix tool is both an evaluative tool and a collaborative project development tool that serves as a foundation to addresses social and environmental equity within a project; short, medium, and long-term.

	Earth care (Environment)	People care (SOCIAL)	Fair share (Economic)
Building Micro-ecologies			
Strategic Intervention Tactics			
Re-seeding Local Knowledge			
Re-situating Art and Design			

An additional indicator, the Inclusive Fitness Theory (Hamilton 1964, 1963), offers a metric to gauge project impact, used to evidence where the pCr ethos and methods spreads into other organisations or working practices towards long-term behavioural change





MM6: LITG ROLE OF THE PCR METHOD

The methodology also developed an extended concept of SMART goals, to SMARTER, that sought to integrate goals reflective of the current and future context:

S - Socio-culturally specific, Simple, and Sincere
M - Meaningful, Manageable and Measurable
A - Appropriate, Achievable, Aspirational Ambitious
R - Relevant, Responsive, Reviewed and Revised
T - Timely and Time-specific
E - Eco-considerate and Ethical
R - Resilient, Resistant, Resourceful and far - Reaching.





WHAT IS DESIGN THINKING?



Working in pairs, google these words (or use a dictionary) to find out what they mean and re-write the definitions in your own words

1. Ergonomic -

2. Context -

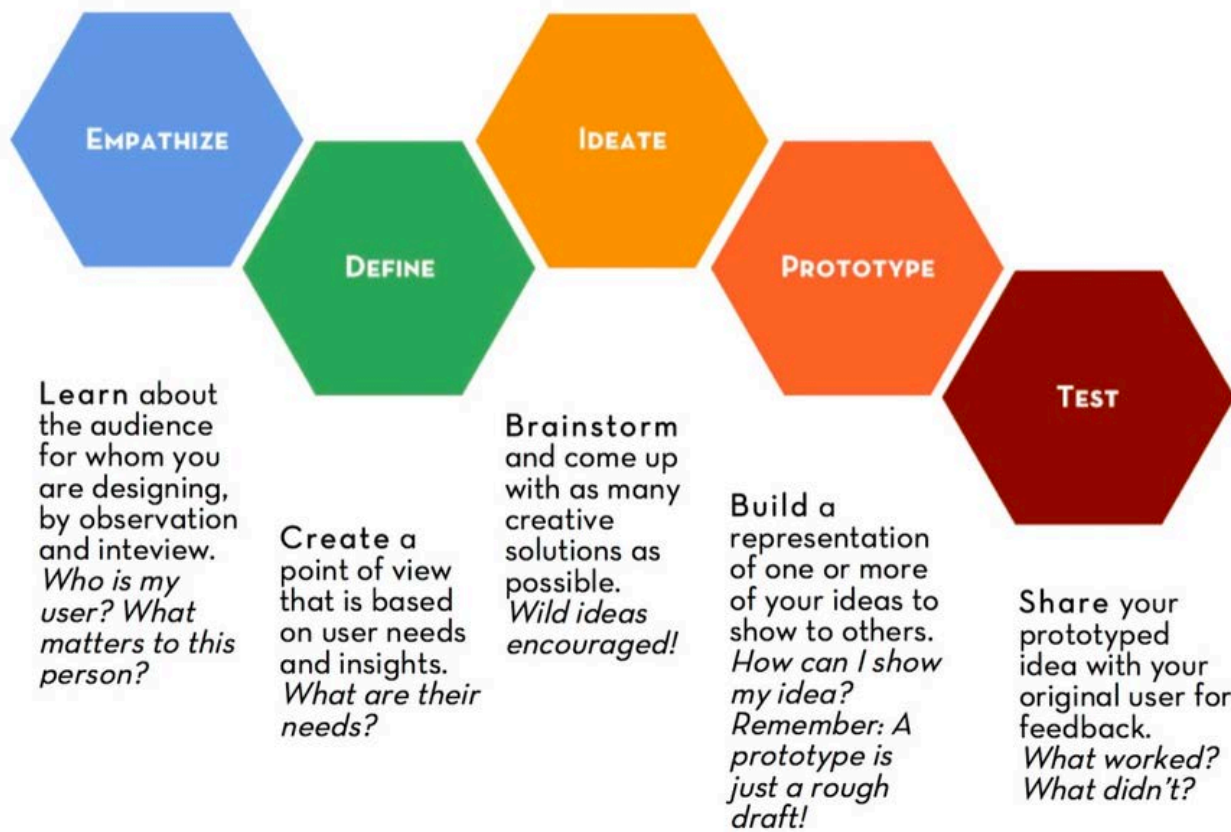
3. Culture -

4. Stakeholders -

Your answers will be shared with the class to build a vocabulary list and definitions - this is called a glossary.



The 5 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 3 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 3 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 2 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:

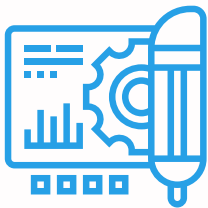
1

2.

Good Ideas:

1.

2.



Prototype- using only 1 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 and they will share with you.

Things to discuss / consider:

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 and they will share with you.

Things to discuss / consider and questions to ask:

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?



Stakeholder Mapping

A project's stakeholders are the people or groups of people who can impact or are impacted by a project. When 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.

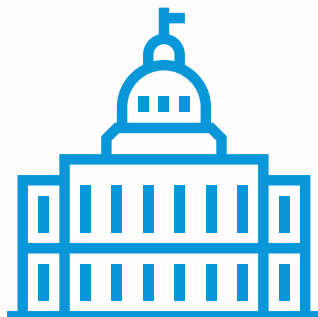
Individually, or as a class, create a list of all the different individuals, groups, or organisations that you can begin to identify and categorise who you might need to discuss or share your project with.



SERVICES / PROVIDERS



USERS / BENEFICIARIES



GOVERNANCE

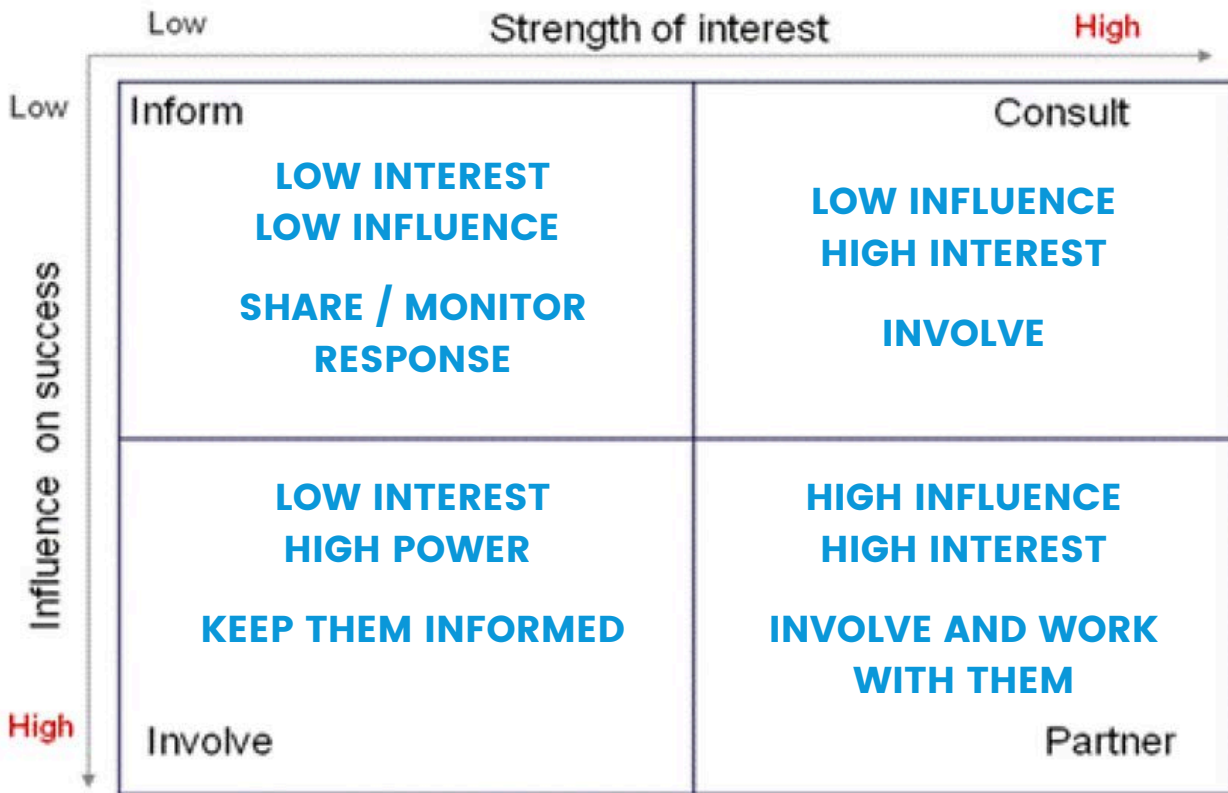


INFLUENCERS



DIFFERENT WAYS OF MAPPING

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



2 Practice Examples:

1. You are developing a climbing frame in a park - using fishing net offcuts. 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 want to create an event to raise awareness about marine plastic in your 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.



Learning about Complex Systems

Why are systems complex? https://www.youtube.com/watch?v=FW6MXqzeg7M&ab_channel=SustainabilityScienceEducation



What is a Wicked Problem (Rittel, 1973)?

What is a Wicked Problem? <https://www.youtube.com/watch?v=IOKpB4KtUZ8>

Watch the video and give 4 qualities of a Wicked Problem.

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

Climate Change is a Wicked Problem

<https://www.youtube.com/watch?v=XR0CxS6n53U>

How can Design Thinking help with Wicked Problems?

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

Watch both the videos above and list 3 areas you could use Design Thinking to work on an aspect of climate change.



- 1.
- 2.
- 3.

If you are interested in complexity and systems thinking here's a few more videos you might find interesting.

- Jamming on complexity https://www.youtube.com/watch?v=WT_zUxRTEjA
- Boundaries define complex systems <https://www.youtube.com/watch?v=9o21WKsM4U8>