

Using Design Thinking to Solve Problems



Student Workbook



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Using Design Thinking to Solve Problems Student Workbook

Use this workbook throughout the Design Thinking project to keep notes, record ideas and plan for action.

Lesson One: Discovering the Waste Problem

Design Thinking Stage: EMPATHISE

Activity One

In this activity, you will work in a group to watch some videos and build on your understanding of waste and recycling around the world.

While watching videos, think about the following:

- What is the impact of waste on our planet?
- What causes this impact?
- What role does recycling play in this context?
- What annoys or irritates you about what you have found?

You can note down the things that stand out to you or make you think while watching each video. At the end record your thoughts about the questions above.

1. Watch *Trash of a Human Lifetime* | National Geographic <https://www.youtube.com/watch?v=ULruDnfw0AI>
Record key notes and discuss thoughts with your group:

2. Watch *Where is the biggest garbage dump on Earth?* <https://www.youtube.com/watch?v=mkfAnQtIUCw>
Record key notes and discuss thoughts with your group:

3. Watch *How Does a Modern Landfill Work?* <https://www.youtube.com/watch?v=lsyg472MQp8>
Record key notes and discuss thoughts with your group:

Activity One (cont.)

Watch *Impact of Consumer Good on the Environment* <https://www.youtube.com/watch?v=NluFskx4mvc>
Record key notes and discuss thoughts with your group:

Watch *Visy Recycling Education Video* <https://www.youtube.com/watch?v=nnH5rUUvd28>
Record key notes and discuss thoughts with your group:

Once you have watched all of the clips, discuss your general observations with your group and record your responses to the questions below:

What is the impact of waste on our planet?	What causes this impact?
What role does recycling play in this context?	What annoys or irritates you about what you have found?

↑
My gripes!

Activity Two

In your group, reflect on your gripes and discuss a related End Goal and 'How Might We..?' question. Record the ideas agreed upon by your group in the space provided below.

Gripe

What is the theme of the gripes on your poster/what heading or description did you record on it?

End goal

What do you want to achieve to resolve your gripes?

'How Might We...?' question

Think about what you want to achieve and phrase as a sentence beginning with 'How might-we...'. You may come up with multiple questions.

Activity Three

Discuss with your group how you might research what your end user group says, does, thinks and feels and record your ideas for how to do this in the table below:

End user group:	
<p style="text-align: center;">Say</p> <p>How will you find out what your end user group says about waste and recycling?</p>	<p style="text-align: center;">Do</p> <p>How will you find out what your end user group does about waste and recycling?</p>
<p style="text-align: center;">Think</p> <p>How will you find out what your end user group thinks about waste and recycling?</p>	<p style="text-align: center;">Feel</p> <p>How will you find out how your end user group feels about waste and recycling?</p>

Activity Four

Work through the following steps with your group, then use the space below to help plan and monitor your end user consultation activities.

1. Choose how you will research further information.
2. Create surveys.
3. Write interview questions.
4. Create tables and charts to record observations in.
5. Plan interviews with end users (such as teachers and other students in your school).
6. Begin scheduling interview times.

TASK 1:

Describe the task:	
What resources will you require?	
Who is responsible for this task?	
Do you need to request to meet with someone? If yes, who?	
When do you need to have completed this task by?	

TASK 2:

Describe the task:	
What resources will you require?	
Who is responsible for this task?	
Do you need to request to meet with someone? If yes, who?	
When do you need to have completed this task by?	

Activity Four (cont.)

TASK 3:

Describe the task:	
What resources will you require?	
Who is responsible for this task?	
Do you need to request to meet with someone? If yes, who?	
When do you need to have completed this task by?	

TASK 4:

Describe the task:	
What resources will you require?	
Who is responsible for this task?	
Do you need to request to meet with someone? If yes, who?	
When do you need to have completed this task by?	

Reflection

Reflect on the skills you have built and your participation in the activities by responding to the following questions:

1. Has your opinion of waste and recycling changed? If so, how; if not, why not?

2. What have you learned about the Design Thinking process?

3. What was easy for you in this session?

4. What was challenging for you in this session?

5. If someone was to describe the way you participated during group-based activities in the session, what would they say?

Lesson Two: Understanding the Waste Problem

Design Thinking Stage: EMPATHISE

Activity Five

Start by sharing and discussing the findings from your end user consultation task(s) with your group. Once everyone has had a chance to share, record observations in the Empathy Map below:

End user group:	
<p>Say What does your end user group say about waste?</p>	<p>Do What does your end user group do about waste?</p>
<p>Think What does your end user group think about waste?</p>	<p>Feel How does your end user group feel about waste?</p>

Reflection

Work in your group to respond to the following questions and complete the task organisation table (if needed):

What parts of the poster/presentation are complete?

Is there anything that is not finished yet? If so, what needs to be done?

Who will be responsible for completing those tasks?

When do the tasks need to be completed by (such as next lesson)?

Lesson Three: Interpreting Information for Ideas

Design Thinking Stages: DEFINE & IDEATE

Activity Seven

In this activity, you will focus on coming up with ideas for solutions to the 'How Might We..?' question that your group is addressing.

Progress through the following steps to develop your ideas:

1. Brainstorm on your own, recording all of your ideas.
2. Share your ideas with your group.
3. Brainstorm further as a team, recording all new ideas.
4. Share your ideas with others and gather feedback.
5. Develop your ideas more based on feedback.
6. As a group, decide on the design solution you will action.

Use this space to note down your ideas:

Reflection

Reflect on how your thinking has changed based on new information you have discovered about waste by responding to the questions below:

What was your original gripe?

What did you think you knew about views and habits (related to waste) of your community when you chose this gripe?

After hearing from end users, has your gripe changed? If so, what is it now?

What is the design solution that you are planning to work on?

What do you hope to achieve with your design solution?

Lesson Four: Imagining a Design Solution

Design Thinking Stages: IDEATE & PROTOTYPE

Activity Eight

In this stage of the Design Thinking project, you will create a paper prototype of your design solution to share with your peers. This is your first go at a prototype that you will receive feedback on, so don't spend too much time perfecting it.

Your prototype should represent the design solution that you decided on in Lesson 3.

Once you have created a prototype of your design solution, run through the questions below. If you can answer yes to all of questions, you are ready to gather feedback on the prototype of your design solution. If you answered no to any of them, you should think about making changes to your design solution before seeking feedback.

Question:	Circle one:
Will your design solution help to resolve your gripe and reach your End Goal?	Yes/No
Does your solution consider the views and needs of the people that will use it?	Yes/No
Will your solution work within the community?	Yes/No
Do you have access to the resources you need to deliver your design solution (in real life)?	Yes/No

Activity Nine

In your group, follow the process below to discuss and respond to the feedback given by your peers.

1. Read and talk through all feedback received.
2. Sort feedback into groups/categories.
3. Work on ideas for to make adjustments or changes to your design solution (not your prototype).
4. Work together to agree on changes to be made.
5. Develop a new prototype of your updated design solution.

You do not need to respond to every piece of feedback you have been given. Think about which ideas will have the greatest impact for end users.

Reflection

Use the questions below to help you reflect on the process of creating a prototype and seeking feedback about your design solution:

How did you feel when you finished the prototype of your first design solution?

How did it feel to have people make suggestions about your idea?

Why do you think you felt this way?

Did you feel differently after you updated your design solution?

Do you think your updated design solution will have a greater impact?

Lesson Five: Seeking Feedback

Design Thinking Stages: PROTOTYPE. TEST & IDEATE

Activity Ten

The purpose of this activity is to gather feedback on your prototype from end users (people who will be impacted by your solution) outside of your class. You'll take this feedback and adapt and improve your design solution before putting it into action.

Seeking feedback on your ideas before taking action will increase the chance of people finding your design solution helpful and useful.

First, decide who you need feedback about your design solution from (in other words, who will be impacted by your design solution)?

The people who will be impacted by your solution are called end users. They are the ones you should seek feedback from – you want to hear about whether they will find your solution helpful and useful.

Note: It is important that the end user you are interviewing understands the problem that you are designing a solution for before you ask for their feedback.

Once you have decided who you would like feedback from, write down the questions you will ask while you are showing the person the prototype of your design solution. The questions you ask should be open-ended. This will encourage the person being interviewed to explain and extend on their ideas. Your questions could include:

- How would you use this?
- How would this design solution change the way you do things?
- How would this design solution help you?

End users' responses to your questions will be the feedback that you can use to improve your design. Schedule an interview with one or more end users. These are best conducted during a lunch or recess break. It may not be necessary to schedule a formal interview. For example, to gather feedback from other students, a stall could be set up during lunchtime and you could speak to people passing by. Two group members should be present during interviews so that one person can take notes while the other speaks.

Plan your interviews in the table on the next page.



Reflection

Answer the following questions to reflect on working in a group:

Did all group members participate in today's activities?

Did everyone have a chance to suggest ideas?

Did all group members listen to each other?

How did you make decisions when people had different ideas?

What are the benefits of working in a group?

What are some of the shortcomings of working in a group? Can they be overcome? How?

Lesson Six: Refining the Solution

Design Thinking Stage: PROTOTYPE

Activity Eleven

In this task, you will work in your group to synthesise end user feedback then incorporate the changes that you believe will improve your design solution.

Work through the following steps:

1. One at a time, share and explain the feedback each group member received.
2. Discuss ways to organise the feedback into common themes. You could do this by writing each comment on a sticky note and sorting them into groups/categories or tallying how many times each comment was made.
3. Identify the comments that were made most frequently and which were made least frequently.
4. Identify the comments which were contradicted by someone else (i.e. one person made a comment, and another person said the opposite).
5. Identify whether comments relate to your group's End Goal.
6. Organise comments and suggestions into the following categories:
 - Important: We want to change.
 - Interesting: We will consider changing if time and resources are available.
 - Not changing: Not relevant to our End Goal or not achievable in our situation.

Record your group's final decisions about each piece of feedback below:

Important: We want to change.

Interesting: We will consider changing if time and resources are available.

Not Changing: Not relevant to our End Goal or not achievable in our situation.

Reflection

Reflect on the feedback received from the community and its impact on your prototype development by answering the following questions.

How was the feedback given by end users helpful?

What changes did you make to your design solution in response to end user feedback?

How do you feel about your current design solution?

Lesson Seven: Implementing the Solution

Design Thinking Stage: TEST

Activity Twelve

Use the spaces provided below to make a plan of the different things your group will need to do to successfully deliver your design solution.

What is the gripe you are addressing?	What is your End Goal?
What is your 'How Might We...?' question?	What approach have you taken for your design solution? (Tick one) <input type="checkbox"/> Awareness campaign <input type="checkbox"/> Event to promote an idea <input type="checkbox"/> Changing or adding to what your school already does <input type="checkbox"/> Other (describe your solution below):
Describe your design solution here:	
When do you need to have delivered your solution by?	

Things we need permission for to be able to deliver our design solution:

Who do we need permission from?	How will get permission?	Who is responsible:	When we need it by:

People/organisations we need to tell about our design solution (advertising/publicity):

Who do we need to tell about our design solution?	How will we tell them?	Who is responsible:	When we need it by:

My Tasks:

Task description:	Due date:	Completed? Y/N

Lesson Eight: Reflecting on Design Thinking

Project Reflection

Activity Thirteen

Work as a group to create a presentation (in a style of your group's choice) showcasing your experiences throughout the Design Thinking project. Use the criteria below to guide you:

Presentation style:	
Criteria	Check
Our presentation...	
... describes how we used the Design Thinking approach.	
... explains why waste was selected as the focus topic.	
... explains how our group built empathy with the end-user.	
... explains how the information we gathered from the end-user helped us to understand concerns/issues/focus areas.	
... details how our group used the brainstorming and prototyping process to develop our design solution.	
... explains how our group used feedback to improve and refine the prototype of our design solution.	
... shows our group's design solution being put into action.	
... explains the challenges that our group faced and the growth of group members during the Design Thinking project.	
... summarises one key thing that each group member learned during the project.	

Reflection

Respond to the following prompts to reflect on what you have learned throughout the Design Thinking project:

Learning about the issue of waste:

What did you know about waste before you began this Design Thinking project?

What have you learned about waste during the Design Thinking project?

How did you feel about waste before you began this Design Thinking project?

How do you feel about it now?

Learning about the Design Thinking process:

Draw the main steps your groups took during the Design Thinking process:

Do you think this process is a useful way to improve things?? Give the process a rating out of 5 (circle one)

1

2

3

4

5

Not useful at all!

Not very useful

Reasonably useful

Mostly useful

Very useful!

Explain why you gave that rating:

.....

.....

.....

Would you consider completing your own Design Thinking project at home? What issue might you tackle?

.....

.....

.....

.....

Teacher Feedback

Below are the Learning intentions that connect to each of the Design Thinking project lessons. Talk about each of them with your teacher to reflect on your learning throughout the project.

Learning intention:	Comment:
Understand more about the issue of waste.	
Be able to empathise with end users.	
Identify and define issues based on data collected.	
Develop solutions to problems identified within the community.	
Understand how to plan and take action in the community.	
Collaborate with peers to develop prototypes, and seek feedback from end users.	
Understand how to seek feedback about a design solution from end users.	
Use feedback from end users to make improvements to a design solution.	
Work collaboratively to implement a design solution in the community.	
Reflect critically on learning throughout the Design Thinking project.	

**“There is no such thing as ‘away’. When we throw anything away,
it must go somewhere.”
- Annie Leonard**