

Collaborative Research and Development (“Seed”) Project 2020/21

**Developing Students’ Creativity, Collaboration and
Problem Solving Skills through Creating the Makerspace in the
Secondary English Language Classroom**

Native-speaking English Teacher Section, Education Bureau



Research Questions

- What are some of the key characteristics of the English language learning environment under which a makerspace spirit can thrive?
- What are the possible outcomes of an English language classroom steeped in a makerspace spirit?
- What kind of pedagogical designs can support the promotion of the makerspace spirit in the English Language classroom?

Project Objectives

This project aims to develop teachers' capacity to:

explore **the place of maker-related skills** in the English Language Education Key Learning Area;

cultivate the **makerspace spirit / maker mindset**;

design English language learning activities that support the development of design thinking;

identify effective maker-centred **learning and teaching strategies** that empower students; and

assess students' English language learning and maker-related skills and attitude in the makerspace context.

Project Focuses

Agency

Design Thinking

Collaboration

Thinking Routines

How can the English Language Classroom become a Makerspace?

Meaningful and purposeful communication in English

Applying language knowledge and skills to exercise one's creativity, collaborate with others and solve problems

Using language to facilitate the application of thinking routines

Work



Transitioning from F2F to Online Learning

Makerspace SEED Project
Yuen Long Public Secondary School

Our Sharing

Part 1 - Mr Dan Henry

How students and teachers used the design process to face challenges this year by transitioning from F2F to online learning

Part 2 - Ms Catherine Lee

How thinking routines were infused into the S.2 curriculum and scheme of work

Our Team

Ms Catherine LEE

Ms Betty KAM

Ms Susan MAN

Ms YiKi CHENG

Ms Mandy NG

Mr Dan HENRY

Ms Julien HAWTHORNE

Ms Adys WONG

Mr William CHENG



Our Objectives

Students will be able to:

- Explore new patterns of thinking
- Share ideas, work, and collaborate with classmates
- Use design thinking inside and outside the English classroom

School Profile

- an EMI School
- has been established for 75 years
- STEM elements infused in KLAs to develop students' talents in STEM-related areas

What is Design Thinking?

Empathise

Define

Ideate

Prototype

Test

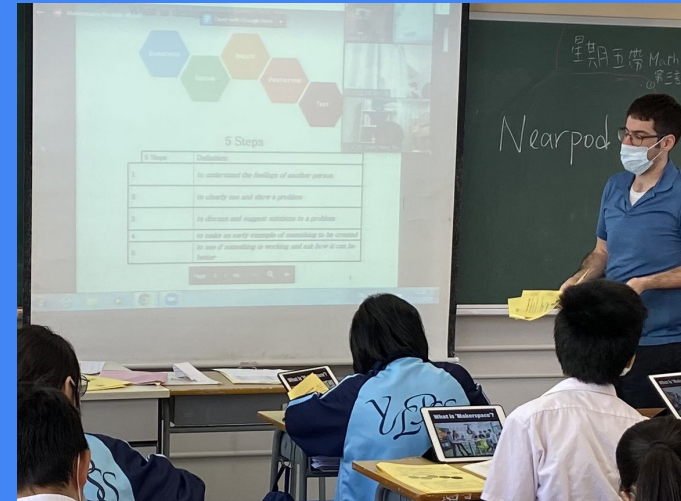
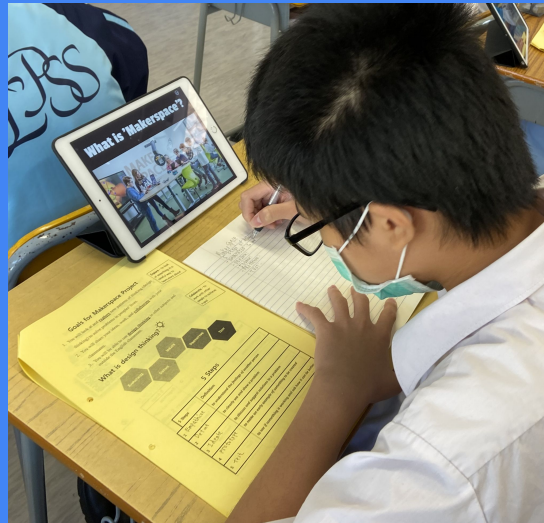
Professional Development

Our school joined other schools in a Makerspace Workshop held by the Operation Solnno Project at PolyU and the NET Section.



Introducing Design Thinking

We started the year with F2F lessons to introduce Makerspace and Design Thinking.

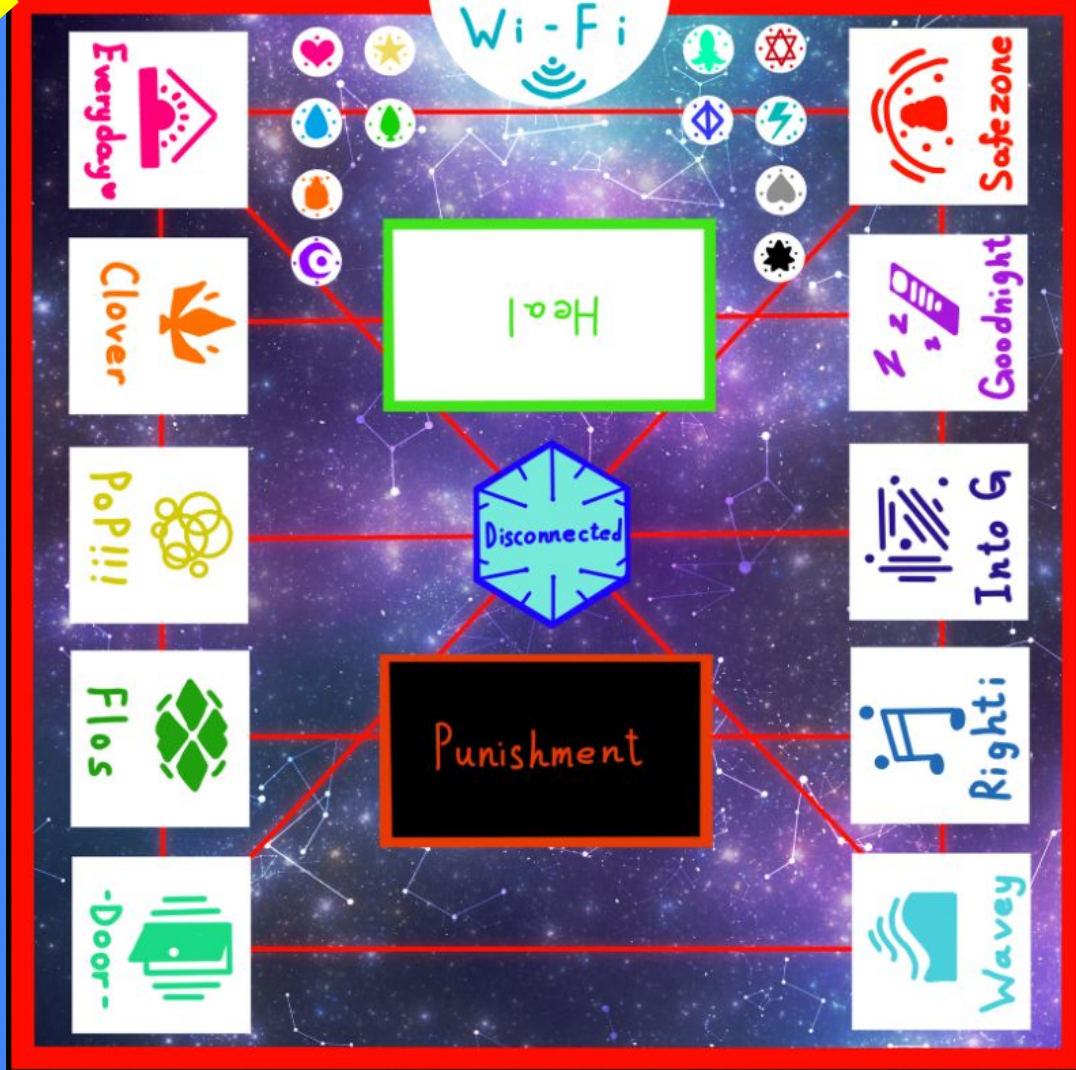


What did we design?

The Monopoly Board Game

Board games for S.1 students using themes from their unit texts - food waste, recycling, social distancing and cyberbullying.





Step 1: Empathise



As teachers, we had to consider our end users and the unique challenges they faced.

Were students willing to collaborate in new ways?

Were students able to adapt to the transition from F2F to online learning?

Could students visualise and actualise their ideas?

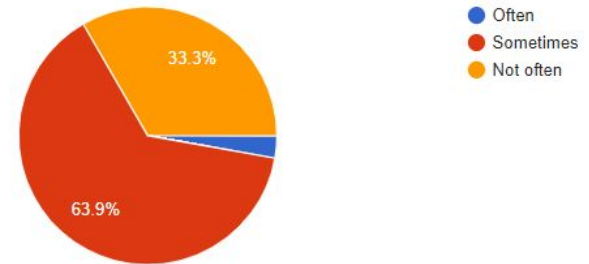


Step 1: Empathise



How often do you play board games?

36 responses



Before designing their board games, students designed questions to survey their end users - S.1 students.



Step 2: Define the Problem



After collecting their survey results, students thought of how to define the problem →
How might we design a board game for our end users' needs?



Step 2: Define the Problem

As teachers, we defined the problem → *How might we design a project that allows for collaboration online?*



Step 3: Ideate



As teachers, we brainstormed ideas to continue the Design Process online.

Some e-learning tools, Peardeck, Padlet, Jamboard, etc, worked great for our students, while other e-learning tools had limitations.

Step 3: Ideate



Teachers designed board games online using Flippity.net



Step 3: Ideate

Google Jamboard gave the best flexibility for groups to collaborate, design and test their board games.



Students
32-36

What are the parts and people of Monopoly?



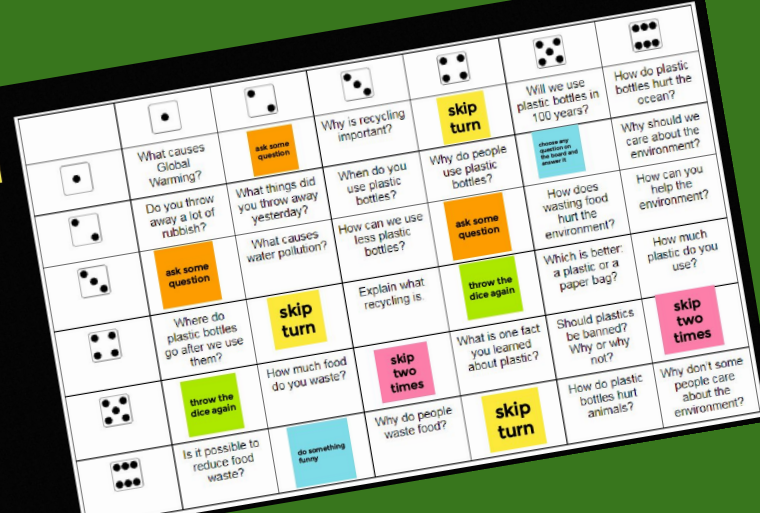
People

4
players

Parts

board, dice, the
money in the
game, pieces, spaces

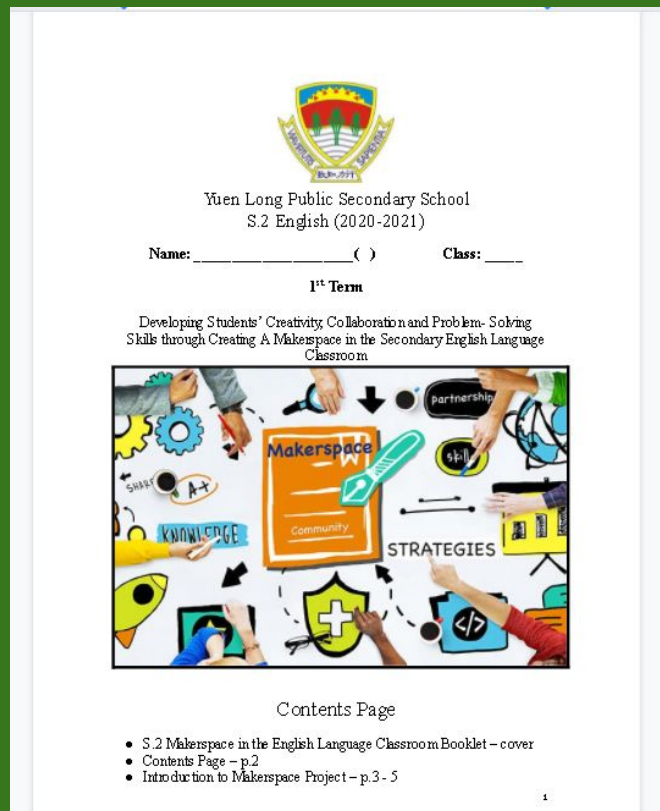
Group 5:
Aaren, Jenna,
Jimmy, Natalie



The Booklet



- Guiding students to do the project





Step 3: Ideate

Students used Thinking Routines to brainstorm ideas to design a board game focused on their end users.



Parts, Purposes, Complexities

Parts - What are the parts?

Purposes - Why do we use the object? What does it do?

Complexities - How do the parts work together to make something happen?

Parts, Purposes, Complexities

Students considered the relationship of parts and their purposes in a board game.



Parts, People, Interactions

Parts - What are the parts? What do they do?

People - Who are the people? What do they do?

Interactions - How do the parts and people work together?

Parts, People, Interactions

Students reflected on how the players interacted with the parts of the game and other players.

Rules
Set-up
1: Each Player takes a piece that you want to be your piece
2: Roll the dice to choose the player who go first
Each Turn
Move your piece that the number appears on the dice
When you are on "chance", pick a card and follow the instructions on it.
How to win:
You will win when you move to the "finish"

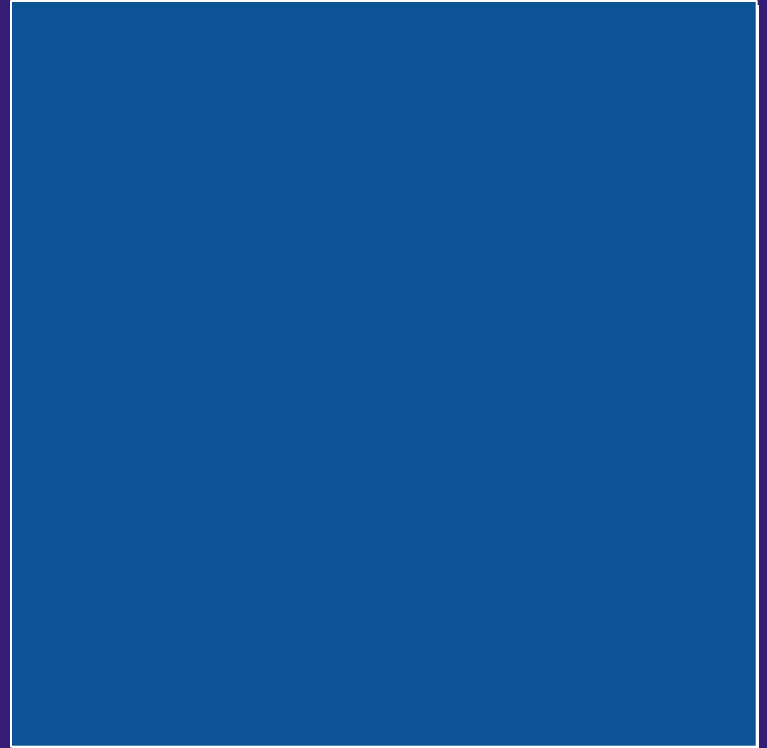


Think, Feel, Care

Think - What does this person do in the system?

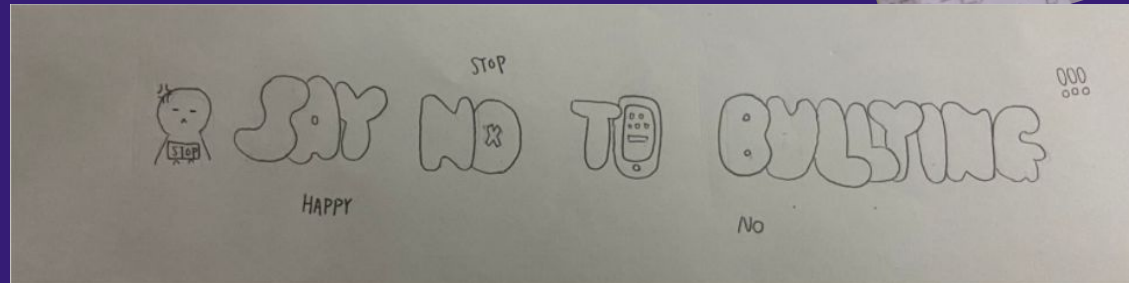
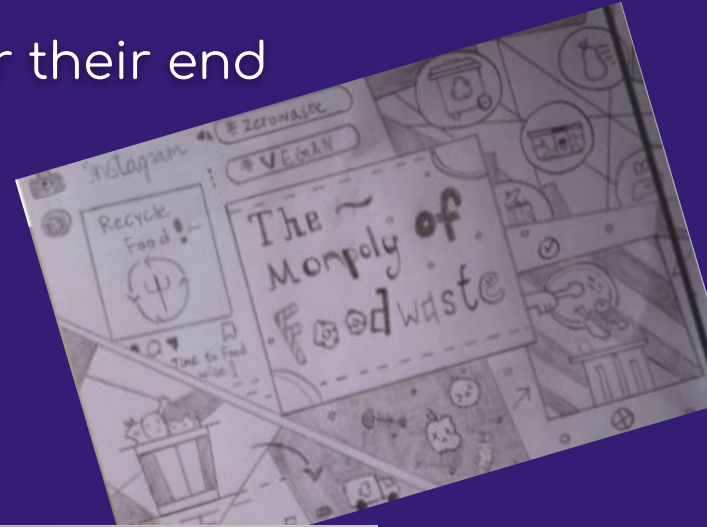
Feel - If you were this person, how would you feel?

Care - If you were this person, what would you care about?



Think, Feel, Care

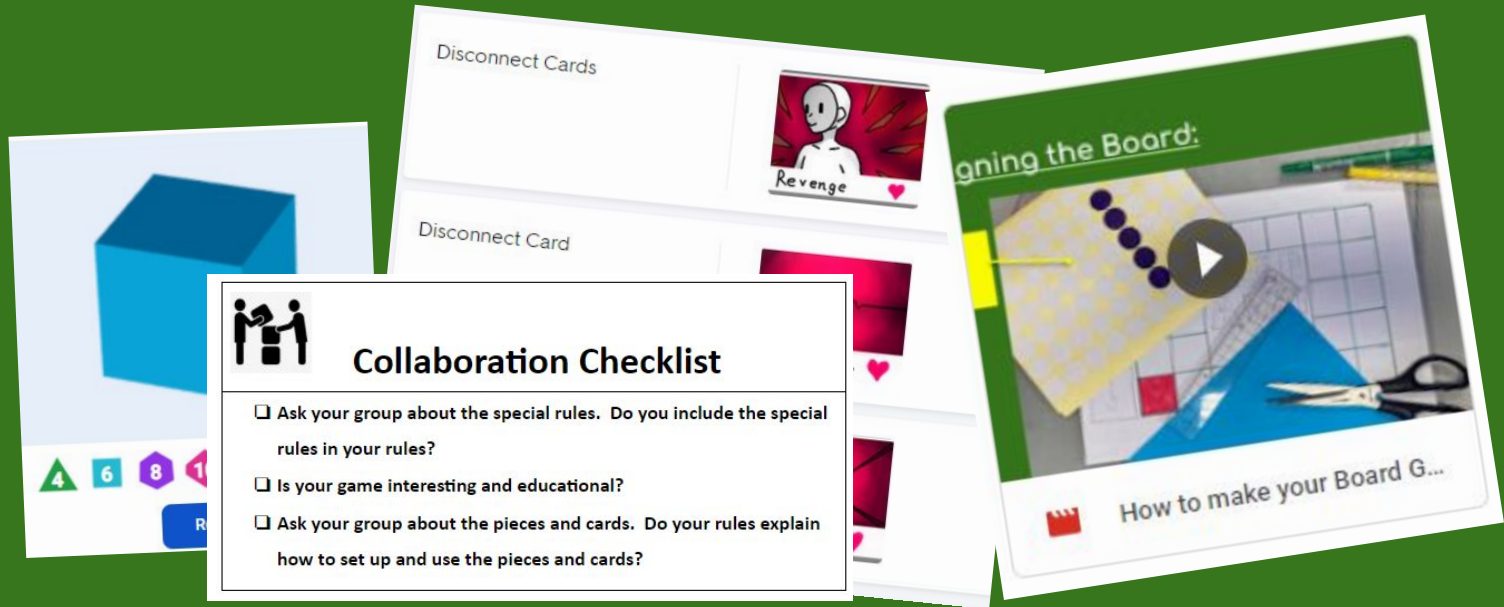
Students considered what was important for their end users in designing their board games.





Step 4: Prototype

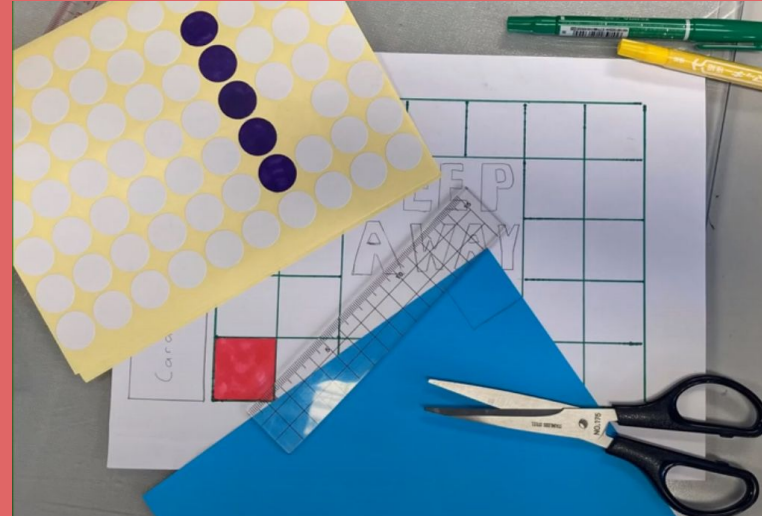
As teachers, we modified and tested e-learning strategies to facilitate group work and the design process.





Step 4: Prototype

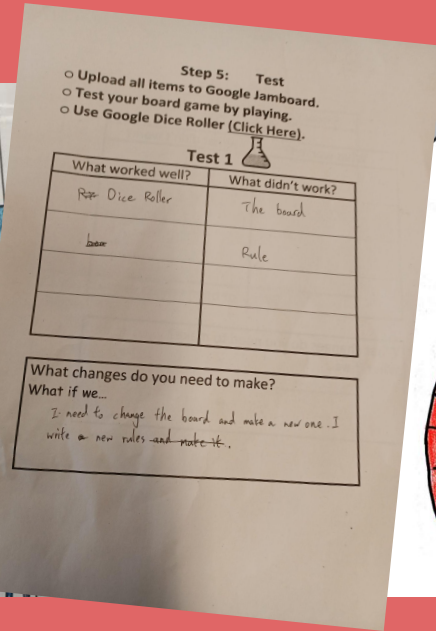
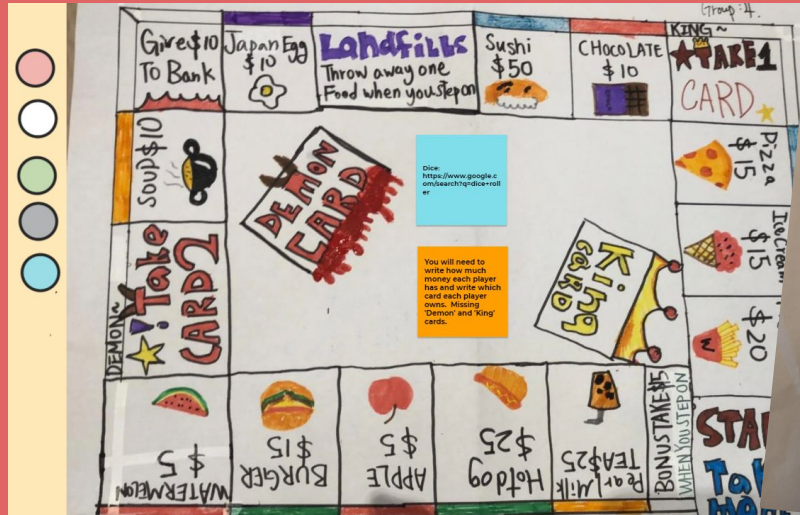
Students designed boards, pieces, cards on paper in the classroom. Then students took pictures to upload to Google Jamboard.



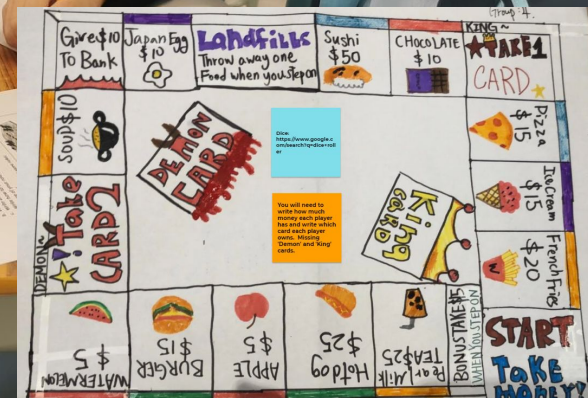
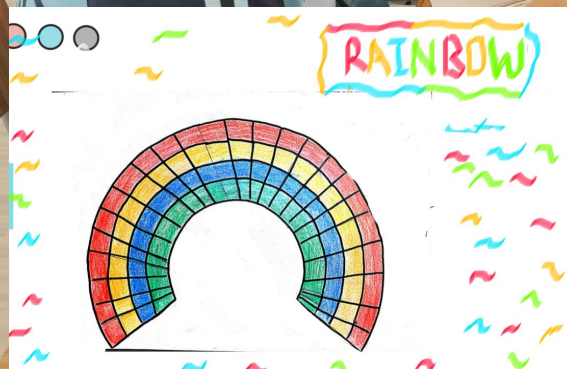
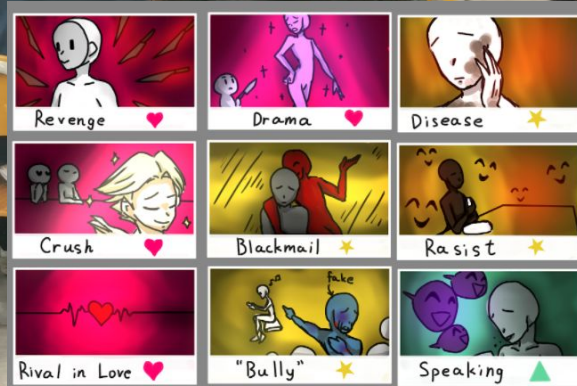


Step 5: Test

Students tested their board games on Google Jamboard. After playing, groups considered what worked well and what needed to be improved.



Makerspace Board Games



Infusion of Design Thinking in the Curriculum

Use of everyday objects and familiar systems to introduce thinking routines

Match with the Scheme of Work



Thinking Routine

Parts, Purposes,

Complexity

Complexity:

Imagine you do not have _____ (a part).

How does this change your object?

1. If I did not have the straps, then I would not be able to carry the bag on my back.
2. If I did not have the zips, then I would not be able to undo or do up the compartments.
3. If I did not have _____, then I would not be able to _____
4. If I did not have _____, then I would not be able to _____
5. If _____, then _____

Give it a try!

What is this object?

School bag image

Word Bank

Adjectives

padded
strong enough
big enough
flexible
wide enough

Verbs

to allow
to close
to fit
to contain

Complete this table with Adjectives and Verbs from the Word Bank.

Parts	Purposes	Complexities
straps	_____ the bag to be carried on a person's back	<u>Need to be</u> _____ <u>to hold</u> the weight of the bag <u>Need to be</u> _____ <u>so that</u> they are comfortable
zips	_____ the pouches	<u>Need to be</u> _____ <u>so that</u> they don't break from repeated use <u>Need to be</u> _____ <u>so that</u> they don't break as the bag changes shape
zip pull / puller / tag	_____ the zip	<u>Needs to be</u> _____ <u>so that</u> it can be pulled easily.

Thinking Routine

Parts, Purposes, Complexity

	fit	Needs to be flexible so that it doesn't break from repeated use
main compartment	to contain the large items to be carried	Needs to be enough tall school books but not too tall Needs to be wide enough wide school books but not too wide
additional pouches / pockets	to contain the other items to be carried	Need to be big enough tall various items but not too tall Need to be wide enough wide various items but not too wide

Complexity:

Imagine you do not have _____ (a part).

How does this change your object?

1. If I did not have the straps, then I would not be able to carry the bag on my back.
2. If I did not have the zips, then I would not be able to undo or do up the compartments.
3. If I did not have the pouches, then I would not be able to to carry all the items I need to carry.
4. If I did not have any zippulls, then I would not be able to to open or close the pouches.
5. If I didn't have a main compartment, then I would not be able to hold any books.

Units in which thinking routines were infused

Textbook units

Thinking Routine

Parts, People, Interactions

Textbook Texts

Good Food Going To Waste
Supermarkets Aim To Reduce Waste

Unit 2: Green living



Q: Can you reduce food waste? Circle your answer on Jamboard.



Copy of Unit 2 Supermarkets Jamboard

To reduce food waste, we have to understand the system, people and interaction of the supermarket.

What is the interaction?



Copy of Unit 2 Supermarkets Jamboard

Task: Write a sentence to show the interaction of parts and people in a supermarket.



Thinking Routine 2: Parts People Interaction

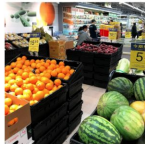
1. Who are these people?

2. What are they doing?

3. Where are they in the supermarket?

Parts

People



Task: Make a sentence to show the interaction.

WHAT IS THE INTERACTION?

Factory owner, factory workers

Farmers



Primary production



Manufacturing



Truck driver



Packaging

Transportation

'We' citizens



Alternative waste management routes

Waste generation

Retail

Example 1: We donate canned soup / fish / beans to local food banks.

Example 2: Factory workers sort and process fresh cucumbers in a vegetable processing factory.



Consumers

Parts, People, Interactions



Set background

Clear frame

Open on a

Task: Make a sentence to show the interaction.

Example 2: Factory workers sort and process fresh cucumbers in a vegetable processing factory.

WHAT IS THE **INTERACTION**?

Farmers



Factory owner, factory workers



Truck driver

Example 1: We donate canned soup / fish / beans to local food banks.

'We' citizens



Consumers, customers

Primary production



Alternative waste management routes



Manufacturing



Waste generation



Packaging



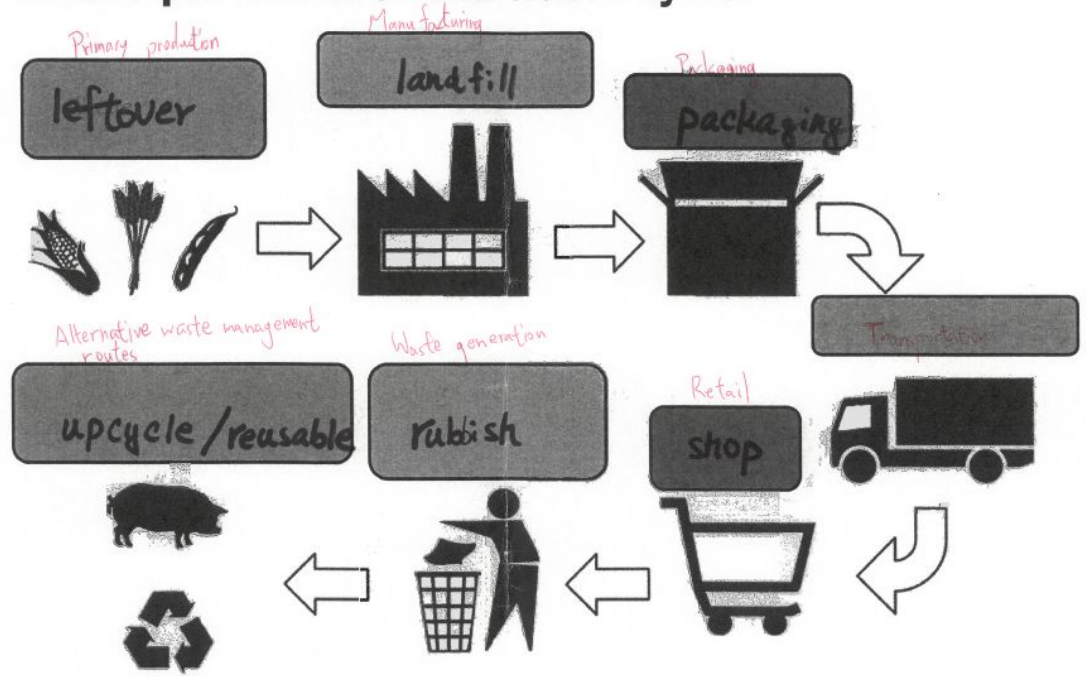
Transportation



salespersons



LABEL DIFFERENT parts of the food waste cycle.





edpuzzle

Unit 2: Green living

A hideous orange looks e_____ (adv) ugly.

Why are journalists (reporters) important in this story?



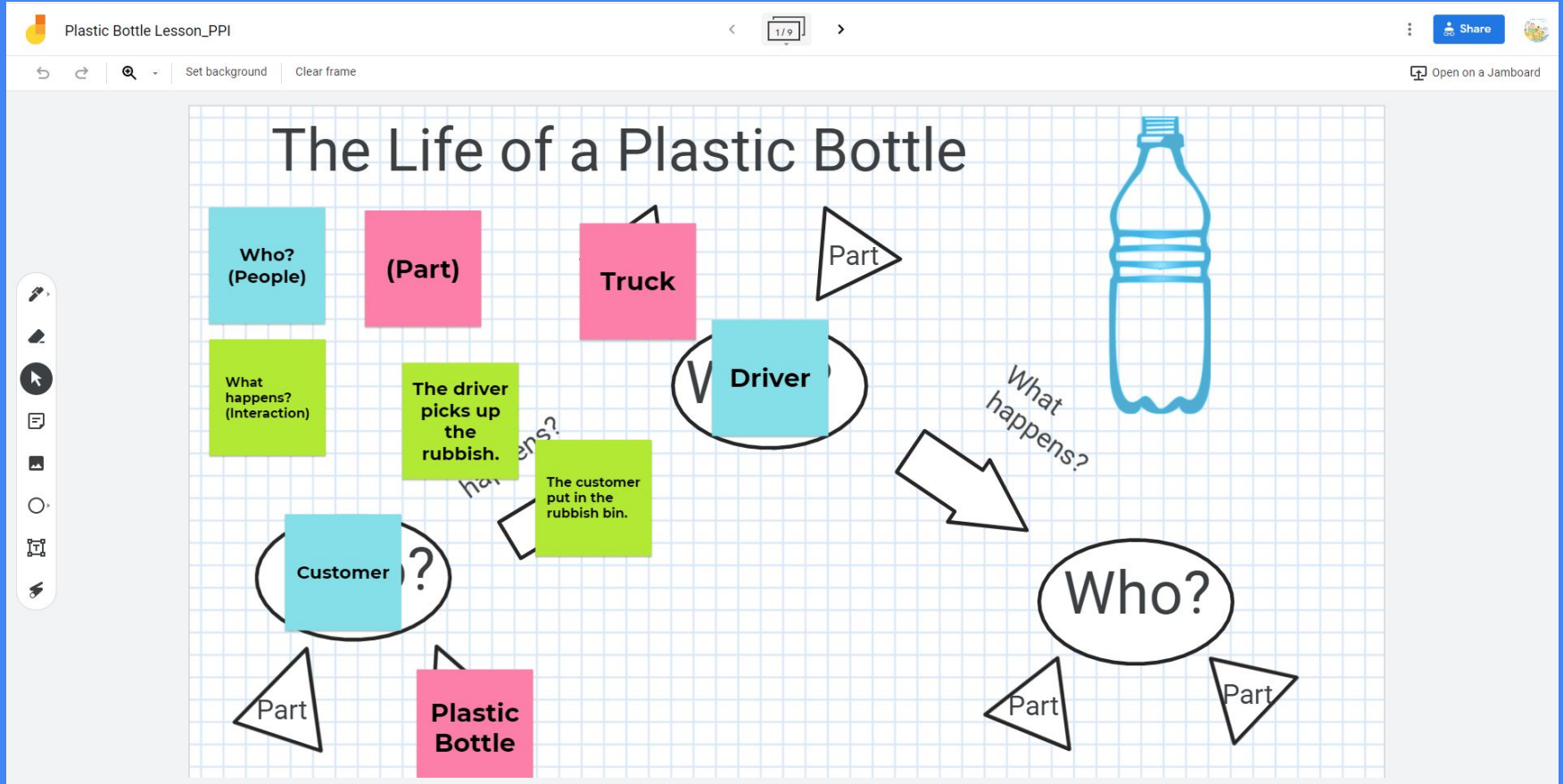
edpuzzle

Extended Part

YouTube Video on
The Life of a Plastic bottle



Extended Part



Thinking Routine

Think, Feel, Care

Textbook Text
Don't Feed the Trolls

docs.google.com/drawings/d/1VQ1pwhk5Sr6VBj6yaVi7VPqhFLRMxT2g4H7jPeeTA/edit

Copy of Empathy Map V2

File Edit View Insert Format Arrange Tools Help Last edit was on November 9, 2020

Share

Empathy Map

Steps:

1. T divides Ss into 5 groups.
2. T instructs Ss to select one person in the pic/ video to practise the empathy map.
3. Use the sticky notes to write down what the character think & feel, see, say & do, etc. (15 mins)
4. Each group presents their empathy map. (25 mins)

Youtube video link:
<https://youtu.be/6-sqQAYjaJs>

以卵擊石? The Wrong Way to Fight Against Bullying

The target / victim

The bullies

The bystanders

want to get status / recognition from peers

bored

intimidating the targets

feel angry /

want to get protection

want to defend oneself

Hear?

scream

being called by nicknames

See?

groan with pain

Say & Do?

jeer, poke and tease others

not wanting to get involved

shout at the victim

escape from the bullies

have fun

stay away

get involved

watch what is happening

Add Text Here

Thinking Routine in Unit 3

Think, Feel, Care

Cartoon images from the textbook

Thinking Routine

Think, Feel, Care

Textbook Texts

*Giving kids a 'Room to Read'
An enterprising solution to social problems*

What is iBakery?

After reading Unit 7 Text 2, complete this sentence:

iBakery is a (a) ____ that (b) ____ and (c) ____ people with disabilities to sell (d) ____.

(a) social enterprise (b) trains (c) employs (d) cookies

+ Add another response

 Students, write your response!

Peer Check Interactive Slide
Get your thinking, thinking!

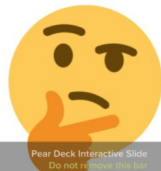
Thinking Routine in Unit 7

Think, Feel, Care

Use Peardeck

Imagine you are a new customer, and you want to learn more about iBakery before you visit their shop.

Think: What are you going to do to learn more about iBakery?



☐ Call their store.

☒ Search and visit their website.

☐ Send them a letter.

The image shows a screenshot of a Pear Deck presentation. The top part is a slide with a yellow background and a white circle containing a whisk icon. The text on the slide reads: "We are a social enterprise under the Tung Wah Group of Hospitals." Below this, there are two images: a woman in a white uniform and a bowl of black bean soup. The bottom part of the image shows a smaller screenshot of a web browser displaying the iBakery website. The website has a green header with the text "Let's go to their website." and a search icon. The main content area of the website is yellow and features a lightbulb icon and the text "We are a social enterprise under the Tung Wah Group of Hospitals." The browser's address bar shows "Students browse: Bakery.tungwah.edu.org/#".

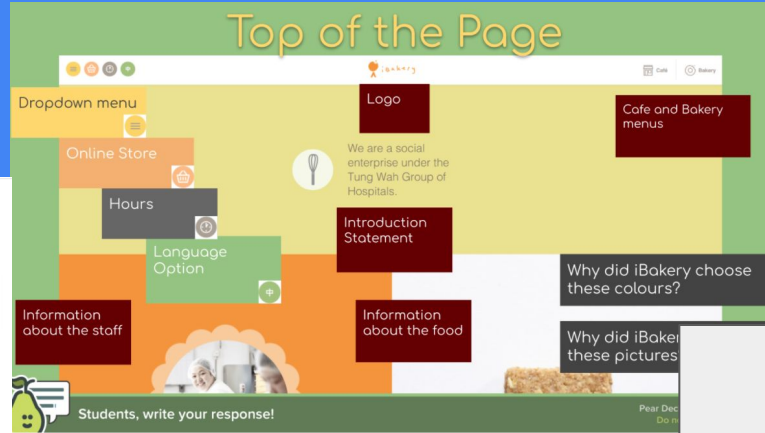
Thinking Routine in Unit 7

Think, Feel, Care

Your visit to iBakery's website

Feel: When you visit their website, how do you feel about iBakery?

e.g. clear, organized, inviting, confusing, welcoming, cold, etc.



Think of the parts

Hours, Logo

A textbook reading text entitled "Giving Kids a Room to Read"

Task: Design a website for 'Room to Read' using Google Slides

Thinking Routine in Unit 7

Think, Feel, Care

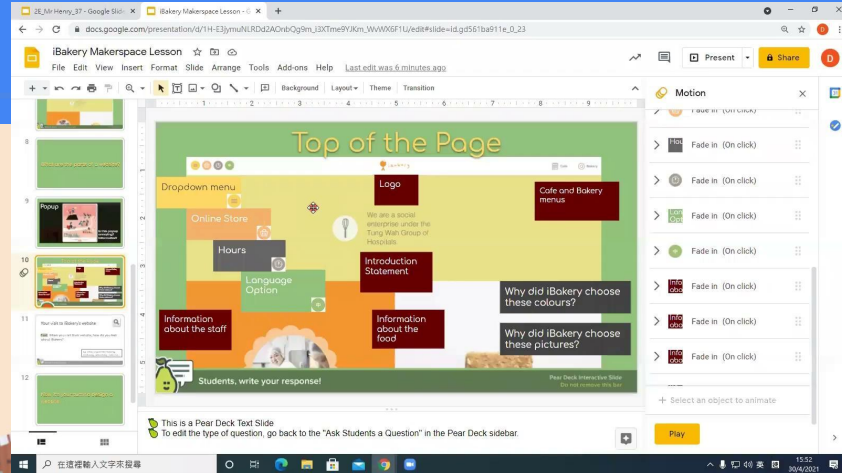
'Room to Read'

Read Unit 7 pages 42-43.

Use Google Slides and image search to design a website for Room to Read.

Include:

- a logo
- introduction statement
- dropdown menu
- location / hours
- titles / pictures of programmes organized by 'Room to Read'



Use Google Slides

Teaching of Grammar

1. To-infinitive Clauses →

Part B



To-infinitive Clauses

From the above example, to-infinitive clauses are used to explain the purposes of the card game. Let's read some more examples of the special cards in UNO Flip!. Underline the to-infinitive clauses.

1. Play the "DRAW FIVE" card to make the next player draw five cards.
2. E.g. Play the "SKIP EVERYONE" card to skip all other players.
3. E.g. Play the "WILD DRAW COLOR" card to make the next person pick until they get a color of your choice.
4. E.g. The first player to get rid of all their cards wins the round.

Yuen Long Public Secondary School S2 English Makerspace Lesson UNO Flip! WS

Name:  Class: S.2 D Group: A/B/C/D R Date: 3/5/2023

Part A

You are going to watch a video on how to play UNO Flip! at <https://youtu.be/V7QCln2mVY>. Watch the video and respond to the questions below.



1. What is the objective of UNO Flip!? (Tick TWO correct answers).

- ☐ to get as many cards as possible
☒ to get rid of all your cards
☒ to win by being the first player

2. Write a sentence to state the objective of UNO Flip!.

The objective of the game is to get rid of all your cards to
win by being the first player.

Teaching of Grammar

2. Connectives of Time

PRACTICE



Fill in the setup with a suitable connective.

How to Play UNO Flip!

Setup

- 1. As (As / When) the cards are double-sided, make sure all of the cards are facing the same way.
- Each player draws a card 2. and (or / and) reveals the light side to the other players. The player who draws the highest number (special cards count as zero) will be the first dealer.
- Shuffle** all of the cards and **deal** seven cards to each player. Players should hold the cards 3. so that (so / so that) the light side faces them, and the dark side faces their opponents.

Part C



Connectives of Time

Connectives of time (subordinating conjunctions) such as *when, after, before, until, while, once, as* and *as soon as* are used to connect an action or an event to a point in time.

Write down two examples from the video.

1. Play the "WILD DRAW COLOR" card to make the next person pick the color of your choice.
2. When you're done to one card, don't forget to yell "UNO!"

Teaching of Grammar

3. Imperatives



Part D



Imperatives

You will use imperatives to write the rules of your board game. Watch the video again. Fill in the blanks with a suitable imperative.

Turn over	Deal	Place	Match
-----------	------	-------	-------

1. Deal each player 7 cards, light side down.
2. Place the deck light side facedown to form the draw pile.
3. Turn over the top card to begin the discard pile.
4. Match with number or color, just like in regular UNO!.

Newspaper Cutting

Parts, People, Interaction

4. Would you like to play this game? Why / Why not?

Yes, because ~~it~~ it sounds very interesting



Part C Feedback

1. What kind of board games might be interesting to S1 students? Why do you think so? Explain your ideas.

I think ~~Secondary~~ S1 students should like Gobang. Because it only requires five pieces to be connected together. And easy to use and fun.

A-

Discover and connect with others.

Newspaper Cutting HW

Name:

Class:

Date: 17-3-2021

Read the article on this website: <https://www.sdawards.org.hk/article/detail/MTR-Board-Game>

Part A Vocabulary

Vocabulary	Meaning	Example Sentence
1. cooperation	合作	This was cooperation and democracy at their best.
2. community	社会	The meeting will be held in the community center.
3. spokesperson	代言人	She used to be the main spokesperson for pets in Asia.
4. create	创建	Such a large design has been created.
5. courteous	有礼貌	The clerks are courteous.

Part B Short Questions

1. What is this board game about?

Play a role interesting a more enjoyable MTR journey and help spread happiness in the community.

2. Who are going to play this board game?

~~the~~ everybody

3. What can players learn from this board game?

Learn politeness and spread happiness to other passengers.

Newspaper Cutting

B. Questions on the news

.. Why are toilets important to people? (Thinking Routine: Think, Feel, Care)

Because toilets represent
dignity and many
people die because they
don't have a sanitary toilet.

Understand the bigger picture.

2. What are the problems with the public toilets in Hong Kong? What do Hongkongers need in a public toilet? (Defining a Problem)

A large number of bacteria
have appeared in public toilets
in Hong Kong. Many of which are spread through the air
and the sanitation is poor. Hong Kong people need to improve the toilet
situation.

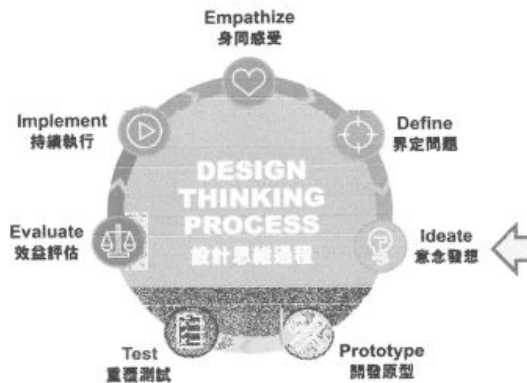
Newspaper Cutting

Imagine If...

C. Feedback (Thinking Routine: Imagine If...)

1. Imagine if all the toilets disappeared, what would your life be like?

Oh no! I don't think I need to survive of course
this is an exaggeration. In fact, if there are no
toilets, the world should be full of foul smells and
many people should die because of the poisonous gas.



2. You are an urban planner of the Hong Kong Government. Draw your design of a new public toilet in Yuen Long district. (Ideate)



Explore and ideate.

Notebook

Board game

Parts: Snakes and Ladders

Pieces (棋子) 8

die (投子) 1

board (棋盘) 1

Spaces (格子) 30

Parts	Purposes	Complexities
board	To play the game on To move the game pieces around on	Needs to be interesting and big enough to move pieces easily
pieces	To move around the board	Needs to be different colors for different players
dice	To randomly choose how many spaces to move	Needs to show numbers.

Parts → What are the parts? What do they do?

People → Who are the people? What do they do?

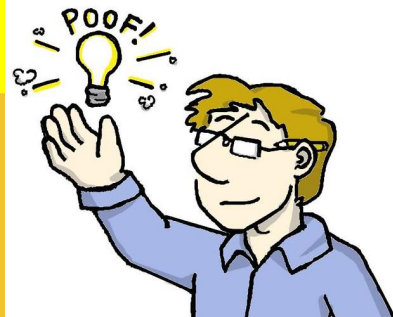
Interaction → How do the parts and people work together?

- system
- parts
- people
- interaction

Parts, People, Complexity Parts, People, Interaction

Parts	People	Interactions
board	players Asker	Moving pieces on board when it's their turn
pieces	The player who answers	Filling with wedges when answering correctly
dice		Roll the dice

Think critically.



Makerspace Worksheets

What are the parts needed? What is the purpose of each part? What are the complexities of each part?

We need dice to roll. The dice need to be big enough to see the numbers we need pieces to move. The pieces need to be different so each player knows where they are. We need a board to play on. The board should be organized so it's easy to play the game.

Parts, Purposes, Complexities

How will players feel about playing the game? What will players think about playing the game? What will players care about when playing the game?

Players will be competitive trying to win.

Think, Feel, Care

How many players? How do the players interact with the parts and other players?

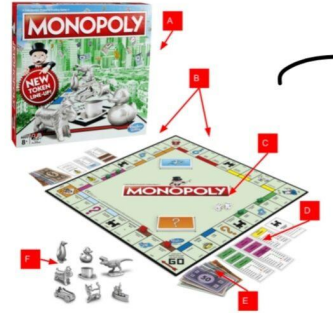
There will be 4 players. The 4 players take turns. On each turn a player should roll the dice, draw a card, move their piece. When a player lands on purple space, then that player draws a card. When a player lands on a green then they lose a turn.

Parts, People, Interactions

How can a board game that you know be changed?

We can change the spaces on a Monopoly board to be classrooms at YLPS.

Imagine If...



	Part	Purpose	Complexity
A	box	To pack and store the game when not being played To describe the game that is stored inside	To describe the game and attract buyers/players. The box should be interesting to look at so people will want to play.
B	board	The main props for the game.	An interesting board where players will be able to track during the game.
C	dice	Used to specify the number of steps the player takes in each round.	Used to specify the number of steps the player takes in each round.
D	Real estate certificate in the game	Used to represent the ownership of the house in the game	Game props can increase the fun of the game.
E	Game currency	Used as a trading item in the game.	Increase cooperation and game fun in the interaction with players such as transactions and exchanges.
F	Piece	To represent the player.	Interesting appearance makes the game more attractive to players.

The Project



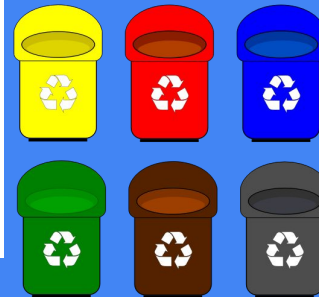
Provide opportunities for language use.

Rules

rule

1. We will go from number one to 49, and those who go to 49 are victorious.
2. There will be some trash cans and recycling bins on the way.
3. If you go to a recycling bin, draw one from a good card, and then you can do it according to the card's reward.
4. If you go to the trash can, you need to answer the question, draw one from the red card, and there will be a question in it. If the answer is correct, you can move around according to the math of the dice. If the answer is wrong, stop for one round.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49					



Evaluation

