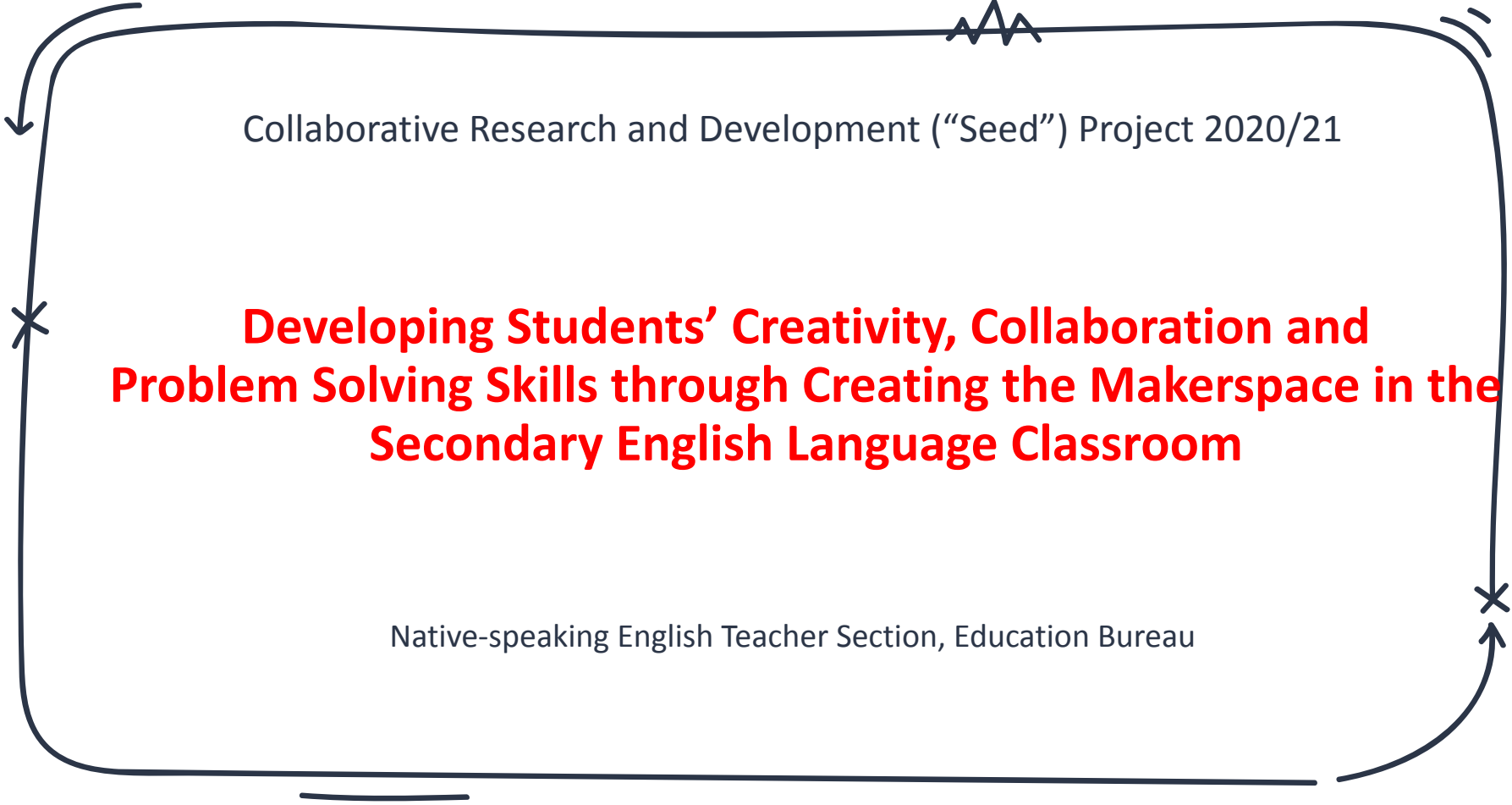




MSS

MAKERSPACE MAGIC



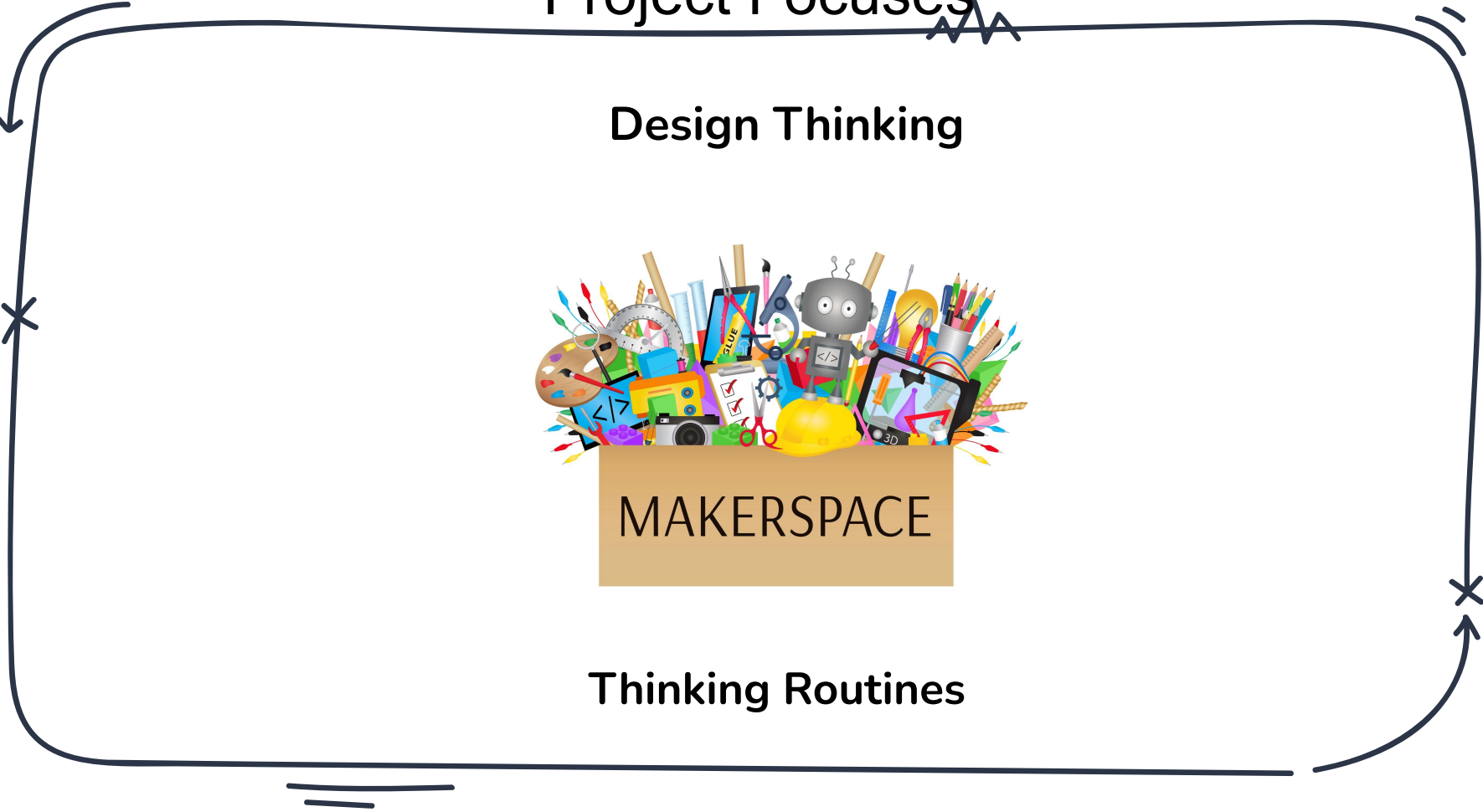
Collaborative Research and Development (“Seed”) Project 2020/21

**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

The diagram is enclosed in a hand-drawn rectangular border with rounded corners. At the top, the text "Project Focuses" is written. Below it, the text "Design Thinking" is centered. In the middle, there is a central illustration of a brown cardboard box labeled "MAKERSPACE" in black capital letters. The box is overflowing with various colorful icons representing different tools and concepts: a palette, a camera, a sewing machine, a robot, a smartphone, a laptop, a magnifying glass, a ruler, a pencil, a lightbulb, a gear, a code symbol (</>), a 3D printer, and a hard hat. At the bottom, the text "Thinking Routines" is centered. A curved arrow on the right side of the border points from "Thinking Routines" up towards "Design Thinking".

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Design Thinking

MAKERSPACE

Thinking Routines

The diagram illustrates a cyclical relationship between three concepts: Design Thinking, Makerspace, and Thinking Routines. Design Thinking is positioned at the top, Makerspace is in the center (represented by a box filled with various tools like a robot, camera, and construction tools), and Thinking Routines is at the bottom. Arrows indicate a clockwise cycle: Design Thinking leads to Makerspace, Makerspace leads to Thinking Routines, and Thinking Routines leads back to Design Thinking.

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

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.

1. Welcome and Introductions
2. Warm Up Activity
3. Background Information
4. The MSS Experience:
 - Year 1
 - Year 2
 - Future Plans
1. Teachers' Experiences and Reflections
2. Q&A



Hey girl/hey



MS.
JOYCE
CHAN

hi



MS.
LAUREN
MINNIE

Greetings



MS.
REBECCA
MARTYN

ARE YOU READY TO PLAY?

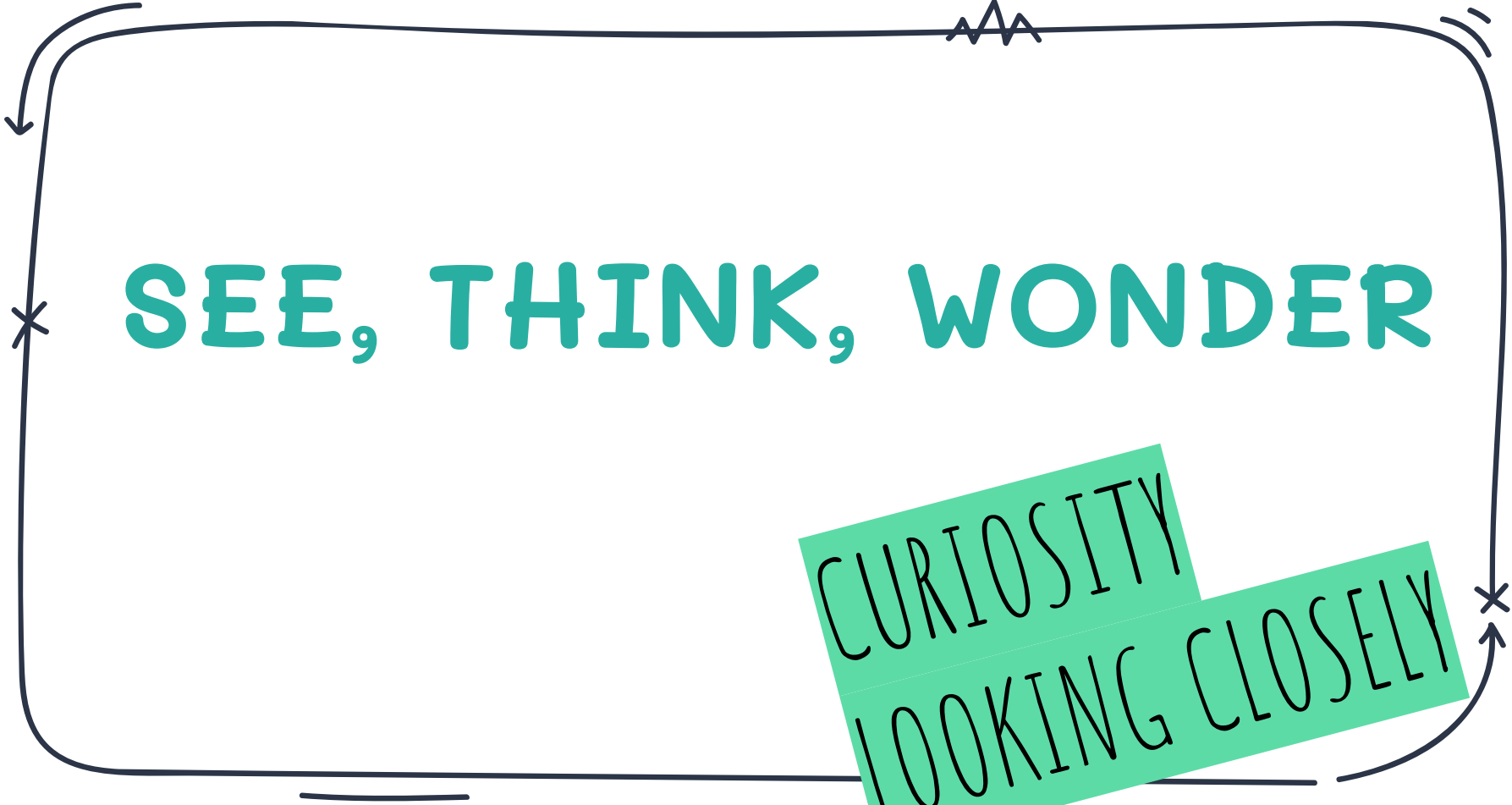
Today, you'll get a taste of the design thinking process, as well as the role of thinking routines, through a hands-on activity.



WARM UP ACTIVITY

- DESIGN THINKING
(PROTOTYPING, TINKERING, TESTING)
- THINKING ROUTINES
(SEE, THINK, WONDER)
(PARTS, PURPOSES, COMPLEXITIES)
- PLAYFUL LEARNING
- DISCOVERY LEARNING
- MECHANICAL DISSECTION

You'll be
prompted to
use the
worksheet
during this
activity.

A hand-drawn rectangular frame with rounded corners. It features a zigzag line at the top center, a double line at the bottom center, an arrow pointing down on the left side, and an 'x' mark on the right side.

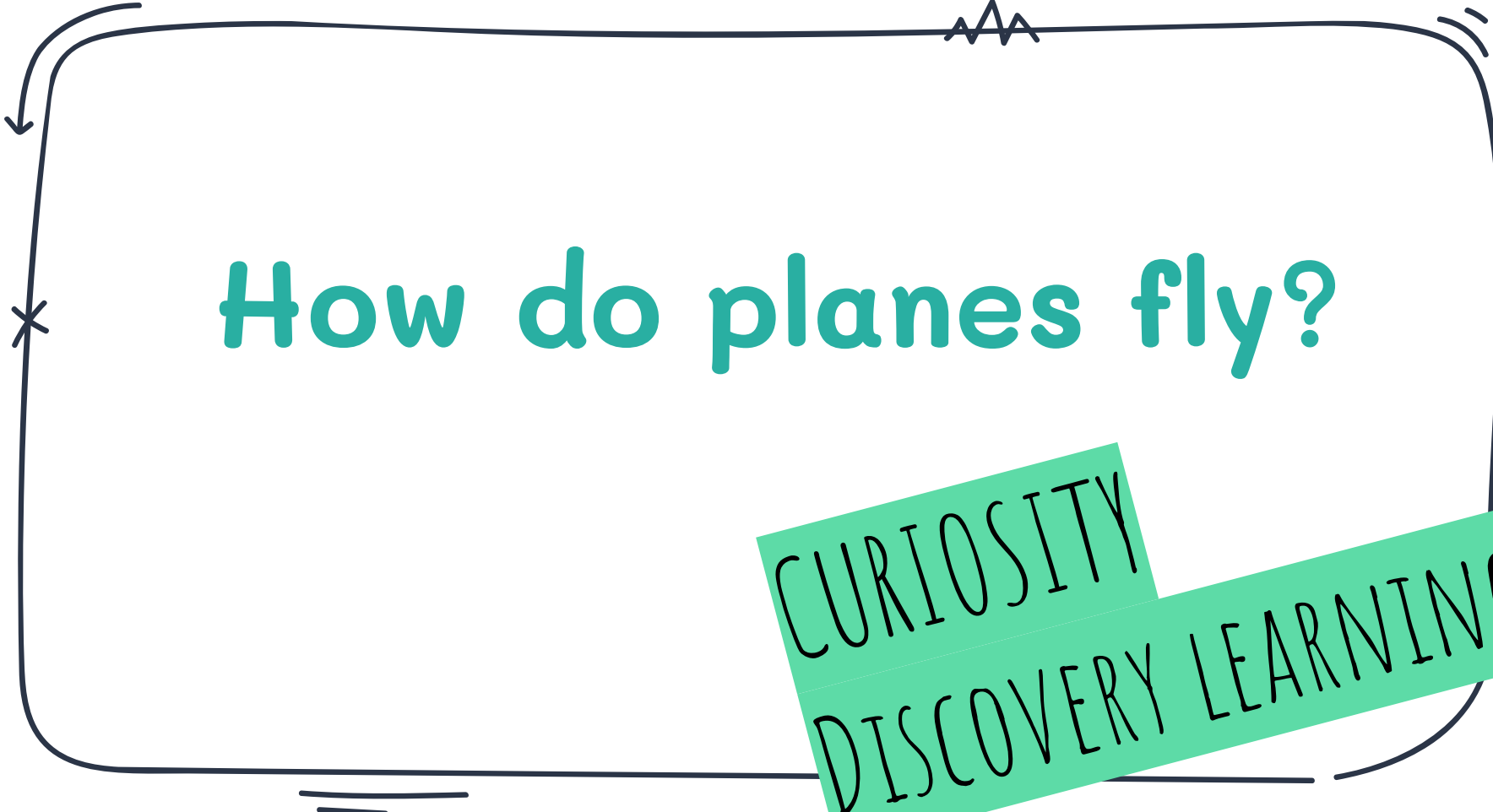
SEE, THINK, WONDER

CURIOSITY
LOOKING CLOSELY

ACTIVITY

You are going to design a paper plane that will help you win the amazing English Panel plane race!

- DESIGN THINKING
(PROTOTYPING, TINKERING, TESTING)
- THINKING ROUTINES
(SEE, THINK, WONDER)
(PARTS, PURPOSES, COMPLEXITIES)
- PLAYFUL LEARNING
- DISCOVERY LEARNING
- MECHANICAL DISSECTION

A hand-drawn rectangular frame with rounded corners. On the left side, there is a vertical line with a downward-pointing arrow at the top and a small 'x' mark. At the top center, there is a zigzag line. At the bottom center, there are two short horizontal lines. On the right side, there are two short curved lines.

How do planes fly?

CURIOSITY
DISCOVERY LEARNING

LANGUAGE FOCUS

- READING AND RESEARCH
- JARGON AND DICTION
- VISUAL LITERACY

MECHANICAL CONNECTION & DISSECTION

CURIOSITY
LOOKING CLOSELY

PARTS, PURPOSES, COMPLEXITIES

As you put together the glider, pay attention to its different parts.

- Think about size, shape, material
- How are they connected?
- Which parts are essential? Which could be changed or eliminated?

CRITICAL THINKING

STEPS

ONE

Play with the glider :)

Now dissect it.

Look closely at its parts
- what is the purpose of
each part?

TWO

Can you make a paper
plane that flies further
than your glider?

THREE

Try again :)

PARTS, PURPOSES, COMPLEXITIES

Create your own paper plane.

- Think about the various parts and purposes of your glider
- What elements do you want to recreate/change/adapt/remove etc?

IDEATE+PROTOTYPE

CRITICAL THINKING

A hand-drawn rectangular frame with rounded corners. The frame is decorated with a zigzag line at the top center, a double line at the bottom center, an arrow pointing left at the top left corner, an 'x' mark on the left side, an 'x' mark on the right side, and an arrow pointing up at the bottom right corner.

**TEST
IT OUT :)**

TEST

PLAYFUL LEARNING

LANGUAGE FOCUS

- COMPARATIVES AND SUPERLATIVES
- ADJECTIVES AND ADVERBS

A hand-drawn rectangular frame with rounded corners. It features a zigzag line at the top center, a small 'x' on the left side, and a small 'x' with an arrow pointing up on the right side. There are also some horizontal lines at the bottom left.

**TRY
AGAIN**

PLAYFUL LEARNING
TINKERING

HOW DOES THIS ACTIVITY TRANSLATE TO THE CLASSROOM?

TASK:

Design a few prototypes of a paper plane and select the best one. **Write a descriptive paragraph comparing your prototypes** and explain why you chose your final design. **Include a diagram** of the design, **labelling** it to show the different features.

LANGUAGE SKILLS:

- Writing (vocab)
- Comparatives, superlatives and comparative phrases
- Use of tense
- Use of hypothetical statements
- Oral skills
- Visual literacy

~ FLYING EBENE ~

Flying Ebene flies
as fast as lightning, as
smooth as silk, as light as
feather.

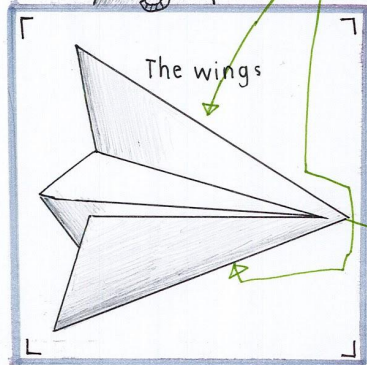
excellent
work!!

⑧ JM

WINGS

- Balance the plane
- Reduce gravity

The wings



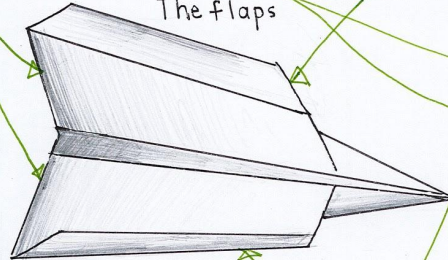
We found out that this is
too light and couldn't fly
far, so we improved

by making the front part
more heavier. We also found
out that the plane doesn't have
anything to block the wind, it is
always pushed down by the wind.

FLAPS

- Reduce the
wind-block
- Stay longer in the air

The flaps



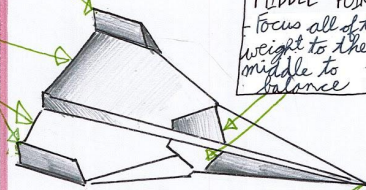
NARROW

- SMOOTHER ✓
- FASTER ✓

The flaps are the most important part since it
blocks the wind so it can stay in the air longer
and fly further. And this plane is going to be
better if it is lighter but the point should also
be a bit heavy to give force to the plane to fly
faster and further. Lastly the narrow ends of
the plane can make it fly faster and smoother.

MIDDLE POINT

- focus all of the
weight to the
middle to
balance



We found that the front part of
the plane is too heavy that it will
always fall straight down very quickly. It is
also a problem that the flaps are too
small that it can't really block the wind.
So we made the flaps bigger in the
third plane

10/10 JM

BOLT

Lift is the air moving over and under the flaps. We made the flaps higher to fly higher and farther.

Thrust makes the paper plane fly forward.

We make the flaps of the plane wider so that its sliding time will be longer.

Gravity pulls the paper plane down. We made the paper plane lighter so that it won't drop so fast.

good research!

Drag is the air that pulls the paper plane backwards. We made the tip of the plane heavier than the back of the plane so that it won't drag the plane too much.

The world fastest paper plane
excellent description

Model 1.0 1.0

The wings of the paper plane are thick and they drop down. It is the slowest among the three models.

Model 2.0 2.0

The wings are thinner than Model 1.0. It is quicker than Model 1.0. The weight is lighter than Model 1.0.

Model 3.0 3.0

The wings are wider than the two models before. The paper is thicker because we think that thicker paper will be more secure. It is faster than the two models. The distance is farther and the tip of the paper plane is pointier. This is the quickest and lightest paper plane in the world. It is as fast as lightning so we call it bolt. It is as light as a feather.

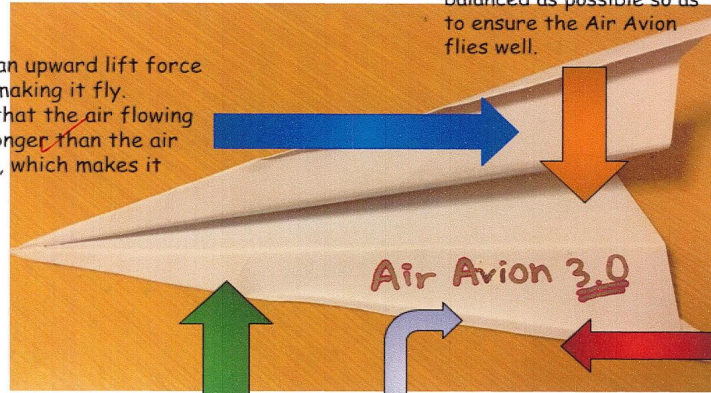
excellent explanation ☺

Name: Air Avion 3.0

The wings create an upward lift force on the Air Avion, making it fly. Also, we ensured that the air flowing underneath is stronger than the air flowing on the top, which makes it have more lift.

lovely explanation 😊

This plane is made to overcome as much gravity as possible.



The plane's forces are as balanced as possible so as to ensure the Air Avion flies well.

The flaps create less drag, so the Air Avion can fly faster.

The person who throws the Air Avion gives it thrust.

Air Avion 3.0 is the newest, fastest paper airplane in the universe! It's also as light as a feather. The model 1.0 was wider than Model 3.0. The 2.0 and 2.5 are relatively better, but they cannot fly as fast as 3.0. Therefore, we have decided to use the one that can glide in the air for the longest time, which is Air Avion 3.0, that is best out there. It's as quick as a real aeroplane and the distance it reaches is as long as a football field!!

excellent comparisons!

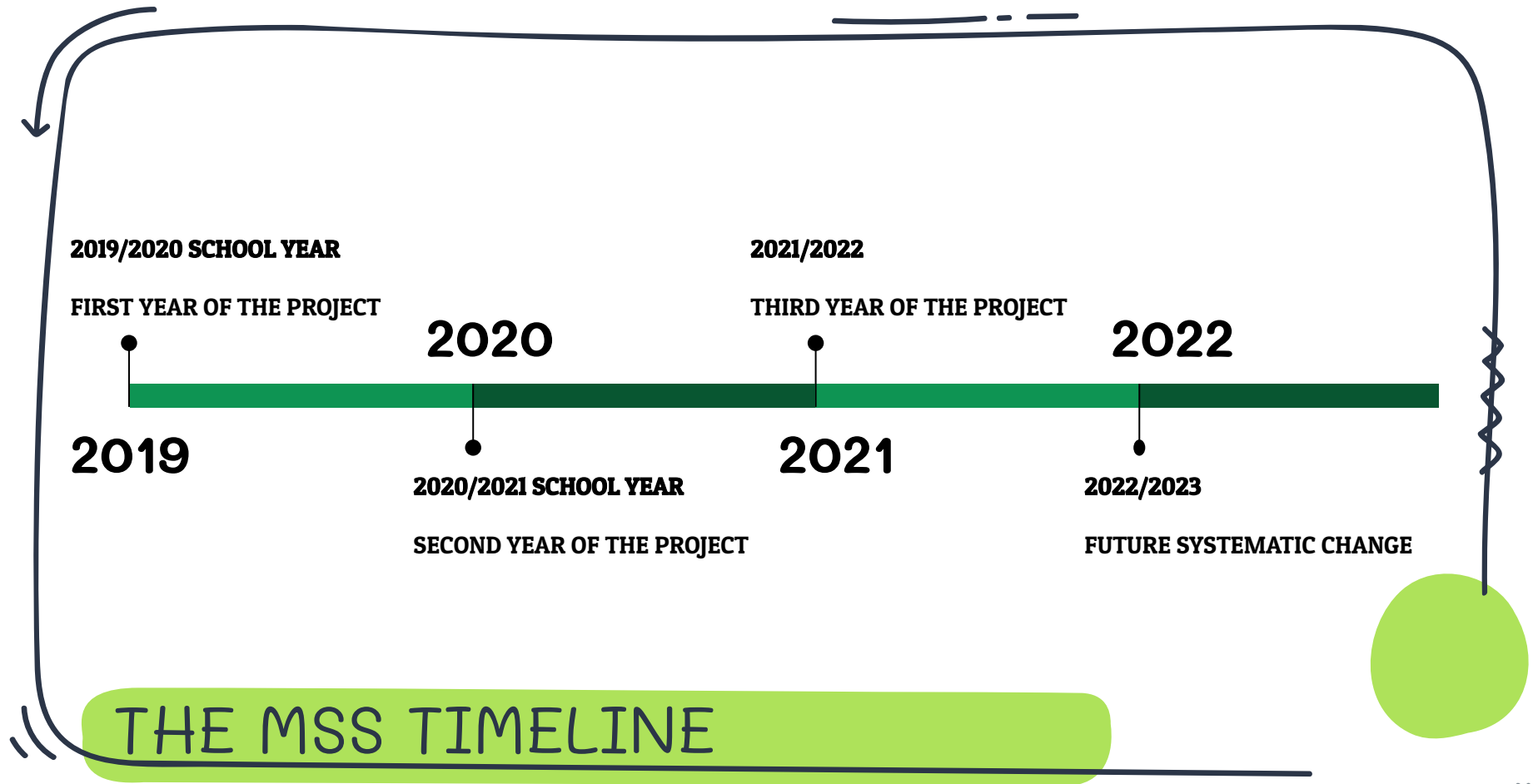
9/10 JM

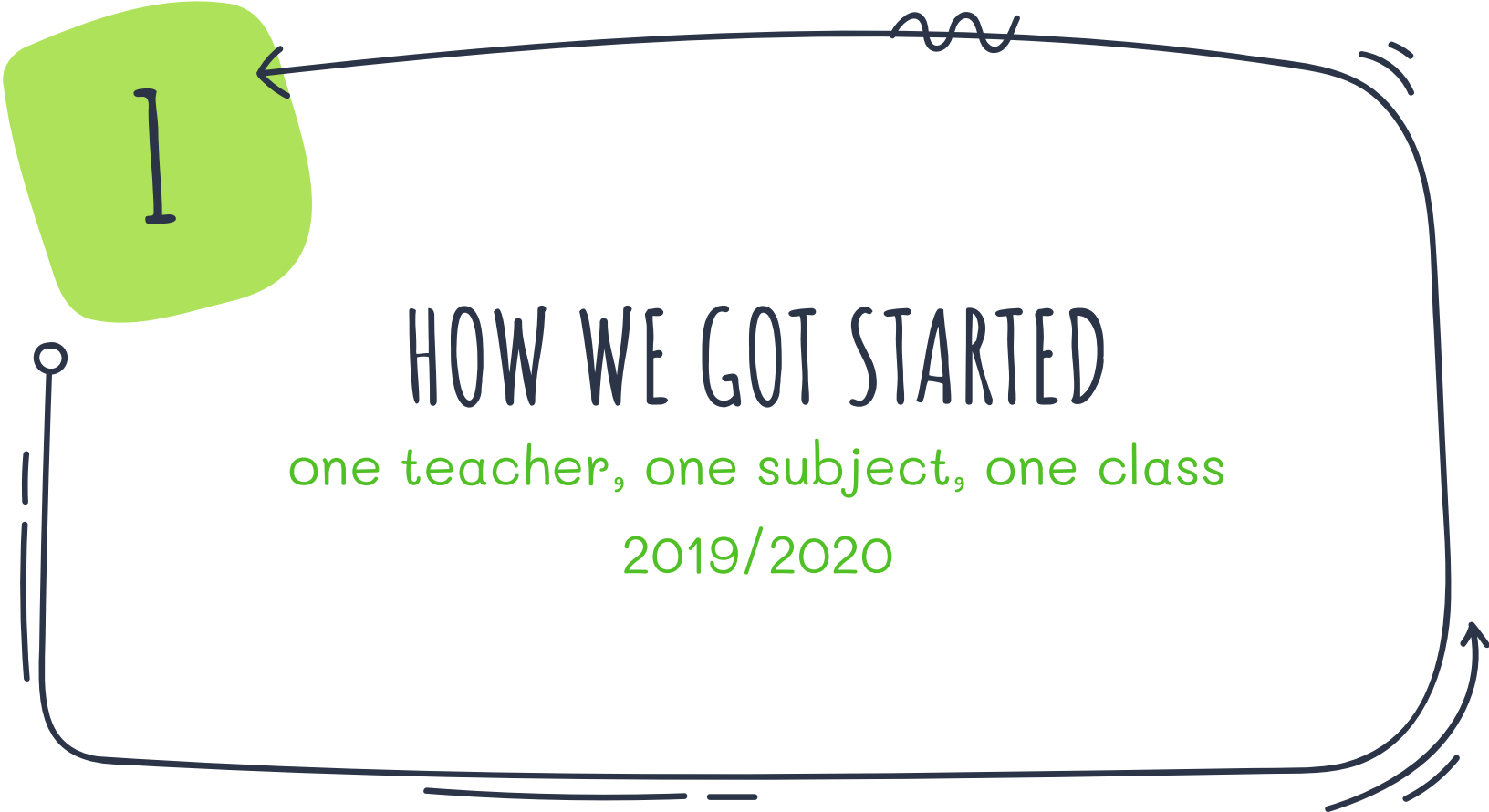
MAKER EDUCATION:

an approach to **problem-based** and **project-based** learning that relies upon **hands-on**, often **collaborative**, learning experiences as a method for **solving authentic problems**.

THINKING ROUTINES:

A thinking routine is a short series of steps that **guides your thought process**. They're simple and easy to use. Best of all, encouraging students to use them regularly will lead to them growing in confidence, **improving critical thinking**, and **more open discussions**.





1

HOW WE GOT STARTED

one teacher, one subject, one class

2019/2020

2019/2020 Proposal and Focus:

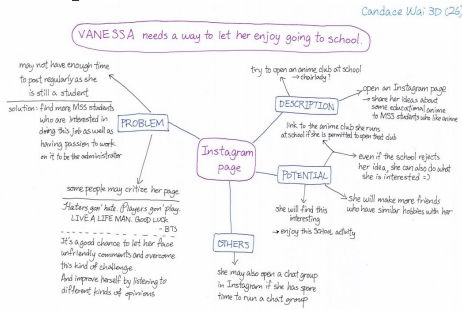
SOCIAL ACTION CAMPAIGNS

- environmental issues and concerns
- impact change in the MSS community
- design thinking, thinking routines, STEM methodology and smaller Makerspace tasks
- authentic use of language with authentic results

PREPARING FOR THE SOCIAL ACTIONS CAMPAIGNS



1. A MINI DESIGN TASK



2. THINKING ROUTINES FOR EMPATHY+COMPLEXITY

Think, Feel, Care

Think: How does this person understand this system and their role within it?

Feel: What is this person's emotional response to the system and to their position within it?

Care: What are this person's values, priorities, or motivations with regard to the system? What is important to this person?

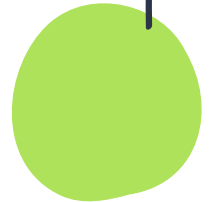
Thinking Routines

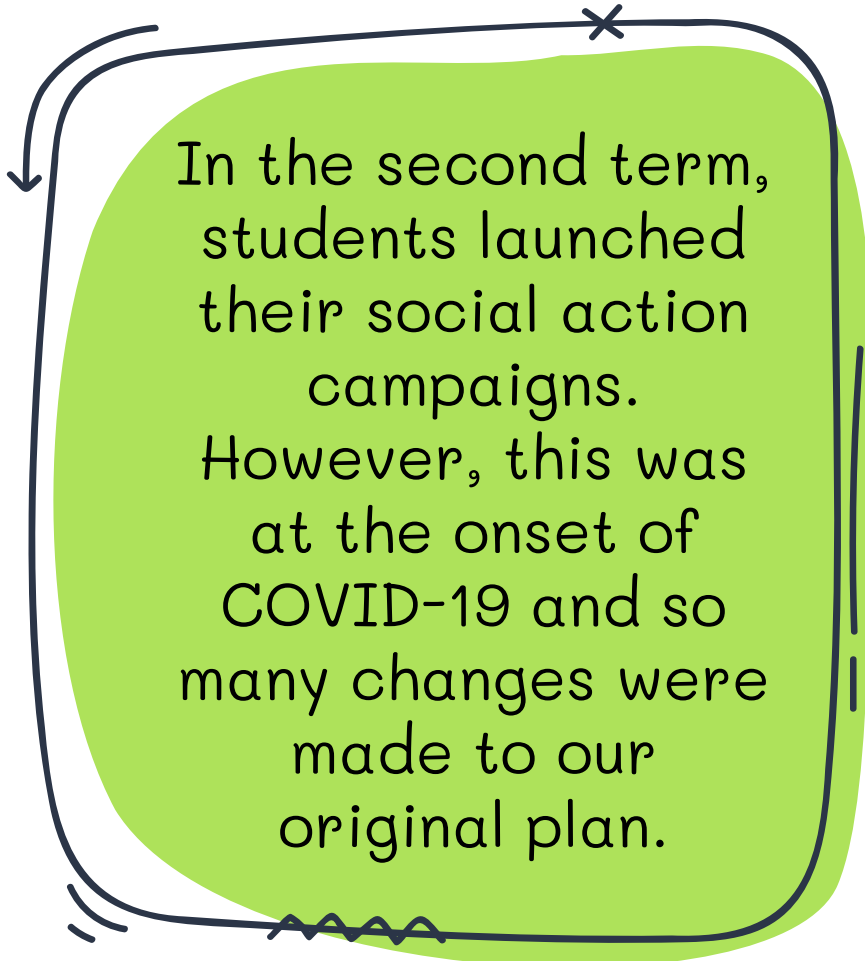


3. SOCIAL MEDIA ANALYSIS AND SKILLS



Social Action Campaigns





In the second term,
students launched
their social action
campaigns.

However, this was
at the onset of
COVID-19 and so
many changes were
made to our
original plan.



A hand-drawn diagram featuring a light green rounded rectangle in the top-left corner. A dark blue line forms a large loop that starts from the bottom-left, goes up and around the green box, then curves down and around to the right, ending with an arrow pointing back to the green box. The text is centered within this loop.

MENDEAVOUR
(SHANNON, NIKI, ETTA)

YEAR ONE HEADLINES AND HIGHLIGHTS

- Engaged students
- Creativity
- Confidence
- Initiative
- Risk-taking
- Development of empathy
- Natural alignment with language skills

"Maker Education has a place in the English classroom!"



When we received the responses from other students, we found some interesting answers. We had a great time reading through and analysing them!



I think that the social action campaign was a good way to learn, not just English but also other skills. As the whole project is big and time consuming, I think it was quite hard for our group as there were many other homework assignments during quarantine. I feel like there was even more work than usual (for all subjects) so time management was quite hard. But if next year the corona situation is better and school is normal then I think it'll be a great activity for students.



I feel like the social action campaign topics can be more broad, instead of just limited to recycling, reusing and reducing waste.



2

The diagram features a hand-drawn dark blue rectangular frame with rounded corners. On the left side, a vertical line extends from the frame, ending in a small circle. A horizontal line connects this circle to a green square containing the number '2'. An arrow points from the green square towards the top-left corner of the frame. Another arrow points from the bottom-right corner of the frame towards the top-right corner, with a wavy line indicating a continuation of the path. The text 'YEAR TWO' and 'overcoming COVID-19 limitations, growing the project' is centered within the frame.

YEAR TWO

overcoming COVID-19 limitations,
growing the project

TEACHERS WHO TINKER

YEAR 1

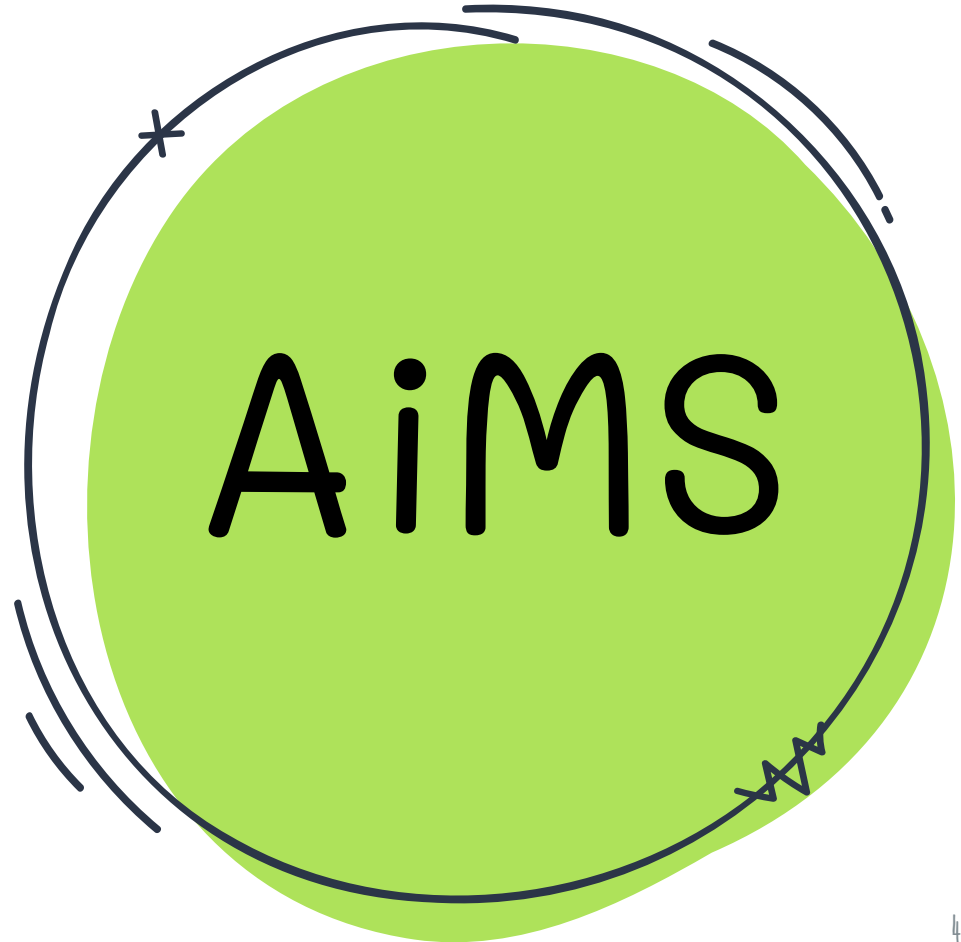
- Term 1 for skills building
- Term 2 project
- One main project
- Specific timeline
- One class

YEAR 2

- Mini tasks
- Highlight a specific design step
- More thinking routines
- Flexibility
- Whole form

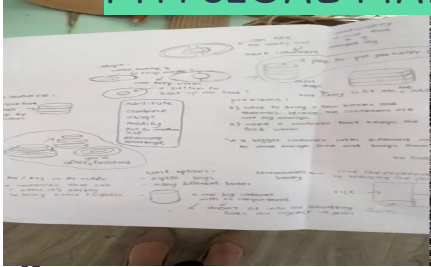
The consistent common factor was COVID-19

- Develop empathy and emphasise the importance of real people, real problems, real solutions
- Help students see the value of thinking routines and offer a 'tool kit' for critical thinking
- Develop positive attitudes towards tinkering, iteration and 'failure'
- Continue to align these various skills with language skills



MINI DESIGN TASKS

1. FOCUSING ON PHYSICAL MAKING



2. FOCUSING ON DIGITAL MAKING



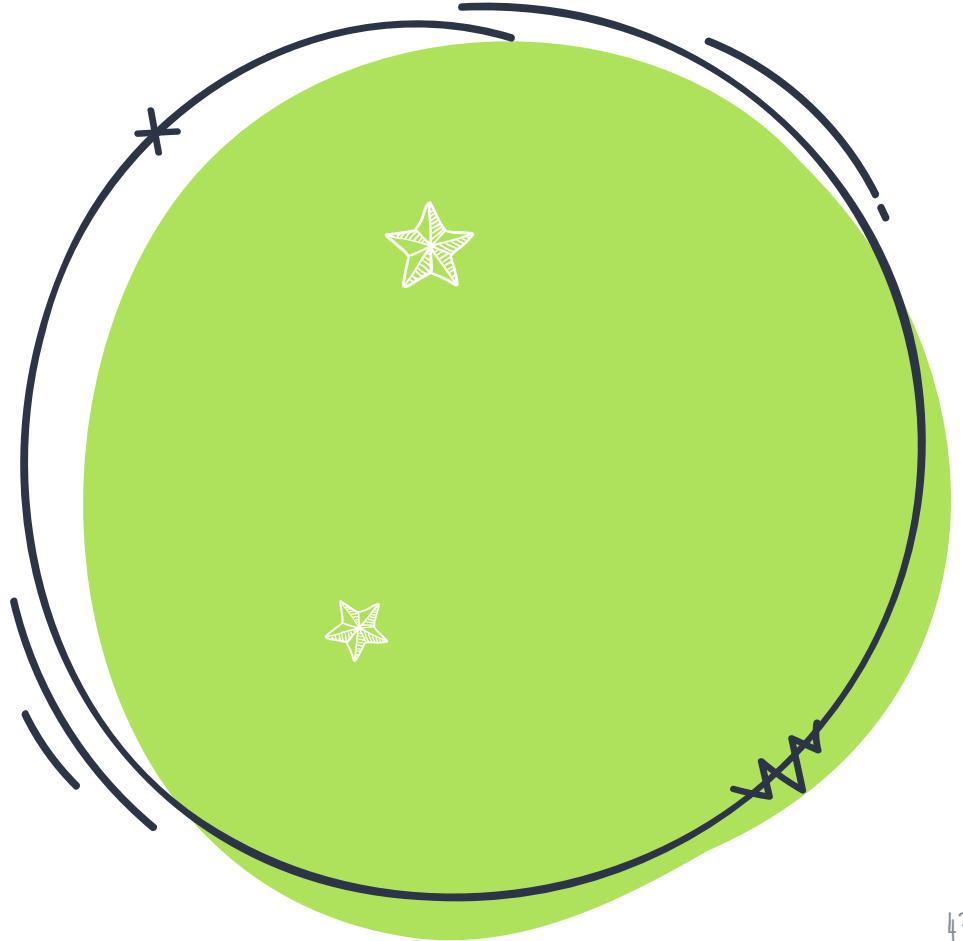
YEAR TWO - HEADLINES AND HIGHLIGHTS

- Students buy in
- Improved empathising
- Positive attitudes
- Engagement
- Thinking Routines successfully adopted

“Thinking Routines provide the foundation for all creative and critical work.”

FUTURE PLANS

The frameworks used in the “Seed” project will be expanded across the junior curriculum next year. We are exploring some cross-curricular opportunities and collaboration with other projects.



FUTURE FOCUS AREAS

FORM 1

Maker tasks aligned with thinking routines

→ providing the skills to think critically and look closely

FORM 2

Maker tasks that focus on the design thinking process

→ highlighting the importance of real solutions and encouraging iteration

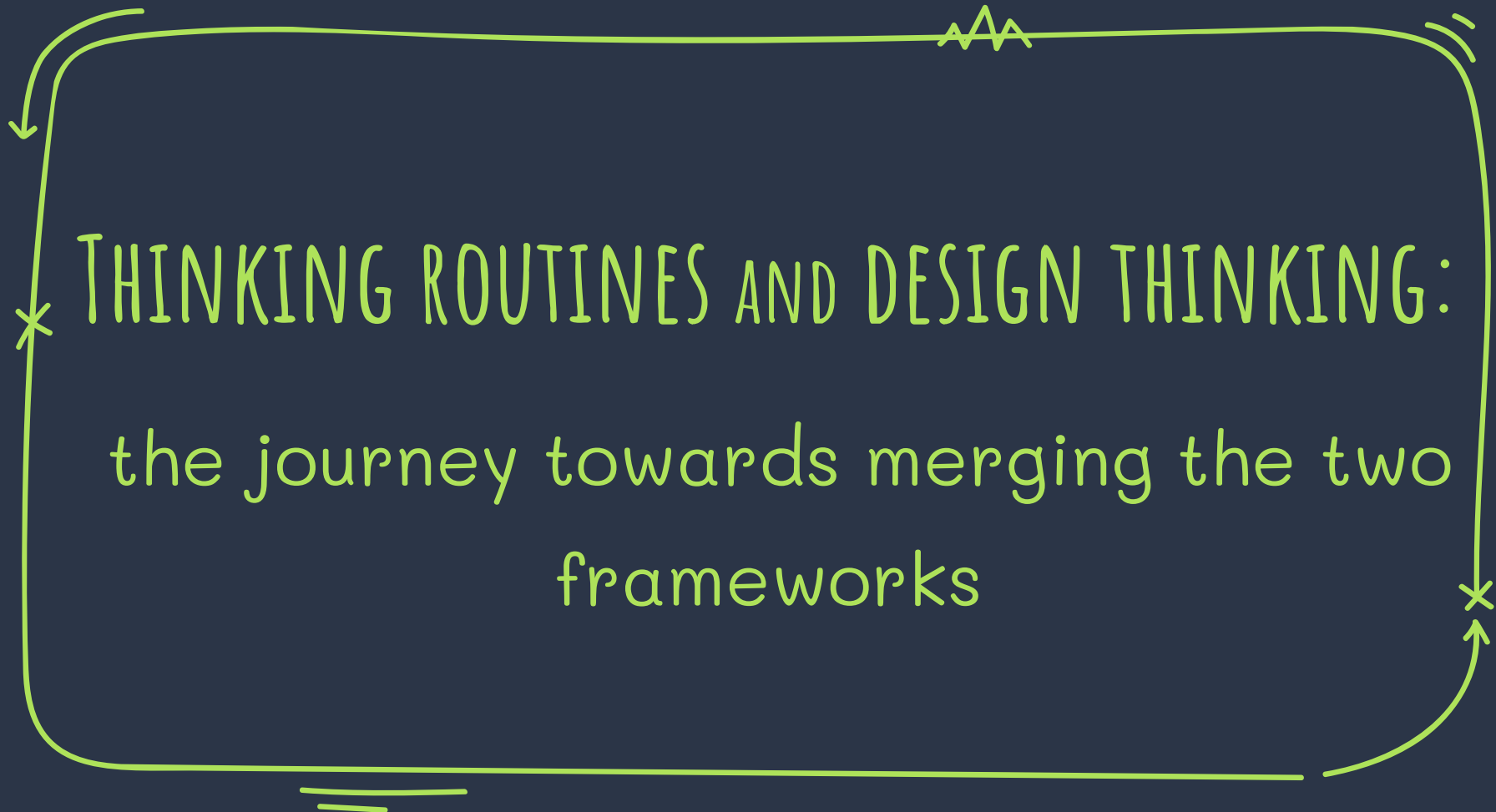
FORM 3

Student-directed, unique maker tasks

→ focus on student voice and choice



5-
minute
break
:)



THINKING ROUTINES AND DESIGN THINKING:

the journey towards merging the two
frameworks

1. How Bloom's Taxonomy, design thinking and thinking routines fit together
1. How thinking routines can be adapted for use in a design thinking activity

Diagram of Bloom's Taxonomy



Task:

To create a device stand that suits your user's [classmate's] needs

*"Think, Feel,
Care" thinking
routine*

*Purpose: to help
us step into the
shoes of others*

Step 1- Empathise

1. Describe your user/s. What do you know about them?

- Student
- IG
- Plays the piano
- Uses iPad to revise and do homework
- Research
- Online shopping

1. What is the situation they are in or the problem they are facing? What is their experience?

- Neck pain due to can't stand iPad
- No iPad case

1. How do they feel? What causes them to feel that way?

- Inconvenient

1. Why is it important to solve this problem?

- Neck pain
- Injury

Adapted "Think,
Feel, Care"
thinking routine

HOPES, DREAMS, FEARS

- To stand her iPad
- Neck no longer painful
- No need to hold iPad with her hands
- the heavy iPad
- can't revise and do hw conveniently
- to study hard and get good results

DESCRIBE THE PROBLEM

- Can't stand her iPad
- Heavy iPad but need to hold it with her hands
- Neck needs to be lowered in order to see the iPad screen -> neck pain
- Can't fully focus on what she's studying

DESCRIBE YOUR USER

- Student
- Use iPad to revise and do HW
- Likes the colour green
- Uses the iPad for scrolling
- For research
- For online shopping

- Inconvenient
- Neck pain and tiring hands
- Wanted to solve the problem quickly
- Avoid painfulness

FEELINGS AND EMOTIONS

Empathy Map



Step 6- Reflection

My partner, needs an ipad stand which is able to support the weight of her device and be held at different angles which can be adjusted. This stand will help lower her neck and hand pain due to the heavy mass of her device.

To suit her taste, I am designing a new ipad stand for her. This ipad stand is made of thin metal, so it is strong but also light. This stand is also collapsible so it will be easier to carry. Dorothy's favourite colour is green (coming from green apples), and that's why I am also going to colour the stand in green.

As Dorothy spends most of her time on her ipad revising and entertaining herself, she is suffering from neck pain because she always needs to lower her head in order to see the screen of her ipad. So, making a stand which can be rotated to different angles is great and is the most important element to let her neck rest and recover as soon as possible. I made different holes on the piece of metal so it can "click" into the hole and stand by itself.

I also considered convenience as one of the most important impacts as my partner always takes her ipad out. A small and light ipad stand will be easier to carry and be more convenient. Lastly, she will also be able to use her stand no matter where she uses her ipad!

Language Use:

Future forms

Passive forms



ENCOURAGING EMPATHY

**This all sounds fine
but
how do we actually apply
it in our teaching?**

**How does it actually
benefit
our students?**

**Applying empathy as a
thinking skill in an
academic setting.**

We will compare students' progress in applying empathy when writing in these two text types.

1. Letter of advice writing



Written at
end of term

1. Complaint letter writing



Written at
end of term

Let's look at a sample of a student's work.

Student sample 1.1

Class task:

"WRITE A LETTER OF ADVICE TO A
FRIEND ABOUT YOUR THOUGHTS ON A
TROUBLING SOCIAL MEDIA POST ON HER
ACCOUNT."

Dear Renesmee,

I am writing to you about your 'troll' tweet that you posted earlier this week which still hasn't been removed yet. I'm assuming that the video was originally posted to 'troll' people into seeing it by putting cute animals in the first few seconds of the video, leaving to rest be of the suicide scene that the lately deceased openly streamed on Facebook live, but I am one of the many victims who were tricked into watching that gory and horrible death, and I am here for justice on their behalf.

I consider myself to be desensitised to these gory things, seeing as I am a horror movie enthusiast. But that video has traumatised me so much so that I still recall flashes and images whenever I close my eyes, making it impossible to get what little sleep I could because of schoolwork and my other activities. The video has distracted me from all the work that I had or planned to do, like revising for my tests and quizzes and doing my homework, and my grades have been declining since. I fully understand and respect that people are entitled to post what they want on their social media accounts, on the condition that what they post wouldn't hurt anyone, and your video has hurt so many, including me, and I advice you to delete your tweet before it could reach more people and hurt them like it did me.

Social media is a very helpful platform for people to communicate and share their lives and interests with friends and even strangers, but it is also immensely toxic when used inappropriately and what you posted was not at all appropriate. You are luring innocent people into watching that horrible video, potentially scarring them for life, and worse, you are disrespecting a man who felt so trapped and scared that the only way to escape it was to seek death. The man has been through so much and suffered a lot in order for him to make such an important decision. I'll admit, doing it on a livestream in front of people who would then edit the video and 'troll' other people wasn't the best way, but the least we can do is to give the man a little bit of respect. Sharing it and scaring people with it was definitely not respectful in any way.

Next time when you post things on social media, please think twice about how what you post will affect people, how it makes them feel, and deem it for yourself if it was appropriate or not. I trust that you will not make the same mistakes twice and I hopefully won't need to write another letter to you concerning these mistakes ever again. If you can't identify what content is suitable to post or not, you can always counsel me before posting to avoid making the same mistakes as you did.

Commented [1]: Tone is too stern right away. Ask her how she has been!

Commented [2]: Cut your sentences shorter - meaning is muddled by overcomplicating the sentence structure.

Also: whose suicide scene? MUST point out clearly, immediately, as it has no logical link to 'cute pets'.

Commented [3]: This is not the tone of a friend speaking to another friend - make sure you identify the relationship and the requirements of this type of letter.

Commented [4]: This really good - detailing how you personally reacted to it and why it was troubling ENOUGH for you to write about it!

Commented [5]: you mean "but"

Commented [6]: 'myself'

Commented [7]: advice - noun, advise - verb 'I advise you to....'

Commented [8]: Again, with the harshness...

Commented [9]: Ack, this is horrible!

Commented [10]: You are absolutely right, and you have a very solid point to make. Now, WHY do you think your friend did it? Is it for attention? Or is it for something else? Addressing with some empathy her side of the story (or what might be her side of the story) will make your argument even stronger than it already is.

Commented [11]: Again let's not tread into the territory of scolding too much - although you have been polite in many ways, the last thing you want is for your friend to feel attacked, because then she would not be interested in hearing your opinion.

We will read this together in a few seconds...

[Excerpt- opening]

I am writing to you about your ‘troll’ tweet posted earlier which still hasn’t been removed yet.

I’m assuming that the video was originally posted to ‘troll’ people into seeing it

by putting cute animals in the first few seconds of the video, only to suddenly shock viewers with the Facebook livestream of a suicide scene of a lately deceased.

I am one of the many victims who were tricked into

watching that gory and horrible death, and I am here for justice on their behalf.

I trust that you will not make the same horrific mistakes twice and I hopefully won't need to write another letter to you concerning these mistakes ever again.

If you can't identify what content is suitable to post or not, you can always counsel me before posting to avoid making the same mistakes as you did.

What is problematic about this piece of writing?

- **Tone awareness** is low. Too stern.
- **Genre awareness** is low. Reads like a letter of complaint (or prosecutor's speech?), not a letter of advice
- **Audience awareness** lacking.
- **Lack of vocabulary** to identify appropriate **relationship** with reader (a friend not an enemy).

The G.A.P.S. technique

Genre

Audience

Purpose

Style

Work sample 1.2

Class task:

"WRITE A LETTER OF COMPLAINT TO A
SHOP OR RESTAURANT."

[On receiving tarnished jewelry at a store]

I was recommended to your jewelry store by a friend of mine, that she was very satisfied with the service and quality of product. I also see from online reviews that customers at your store are generally very satisfied with your service. I trust that this was merely an uncommon error. I am confident that you will be happy to provide a quality replacement.

[On problematic website at Hollister, a clothing store]

I usually do my shopping at Hollister stores, but due to Covid-19, I changed to shop online for the first time. I have always loved the quality and designs of your clothes, and of course, and your fantastic service. However, this recent troublesome experience at your website have made my initial online experience at Hollister an unhappy one. If the website is more user friendly, I would be more than happy to make shopping online at your site a habit.

[On slow service at a restaurant]

I noticed that the busy lunch service is understaffed, and the waitstaff seem to be overwhelmed . I believe they are already doing their best. It will be hard to improve the quality of the service under these conditions.

Overall improvements in G.A.P.S.

- ability to write for the correct genre
- ability to account for feelings of their readers
- psychology of “what is the best way to motivate the reader for change?”
- reflected in their tone

Genre

Audience

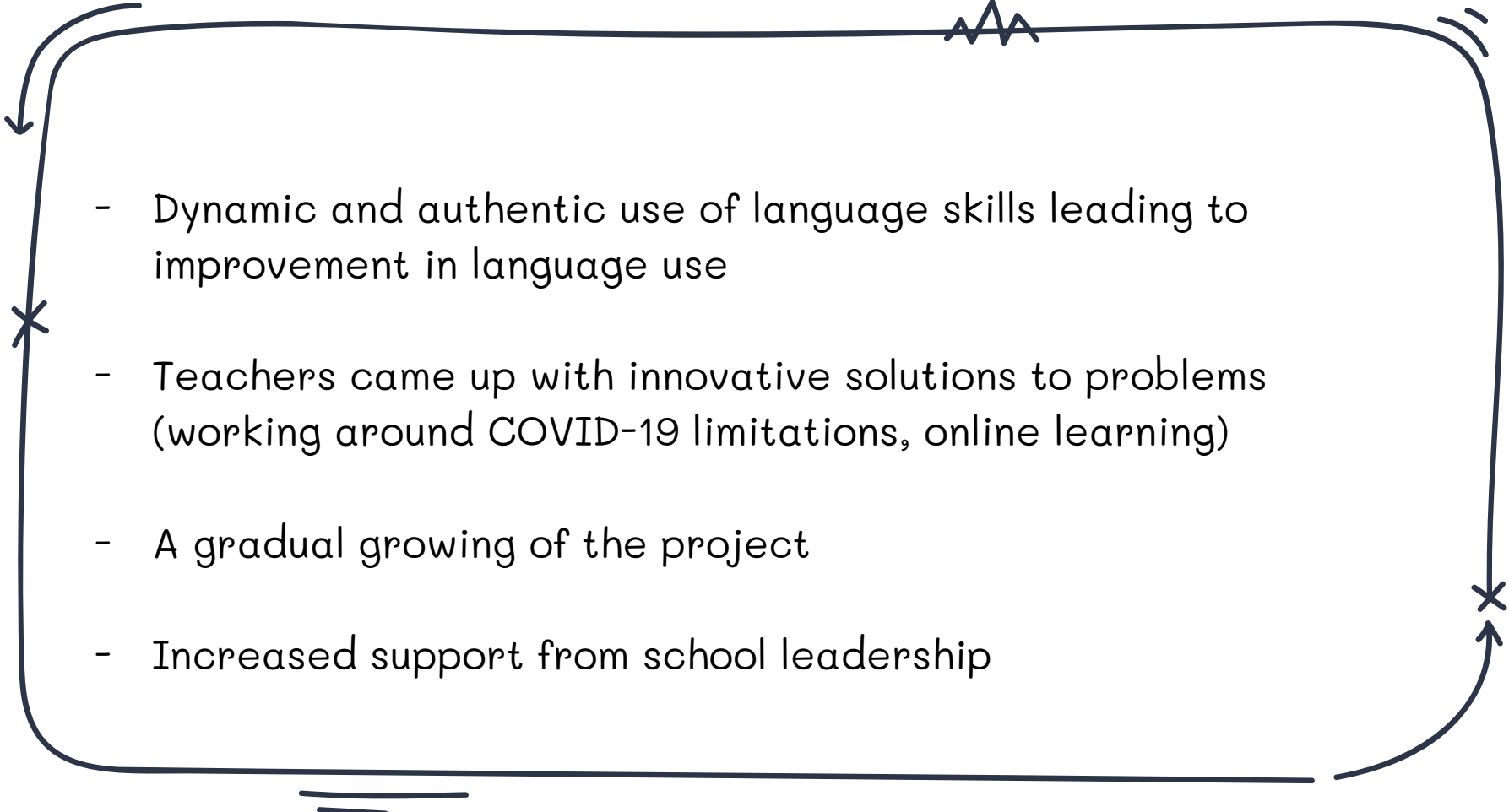
Purpose

Style

Through reiterating this value in class in a variety of different tasks,

students gradually appreciate putting this thinking skill into practice.



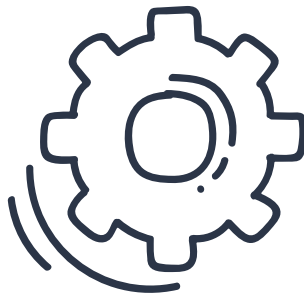
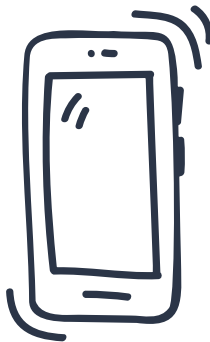
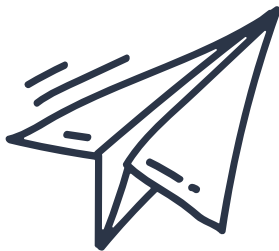
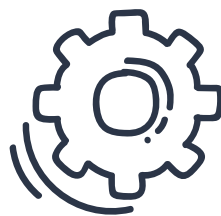
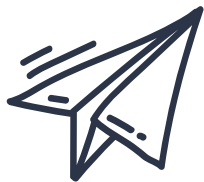
- 
- Dynamic and authentic use of language skills leading to improvement in language use
 - Teachers came up with innovative solutions to problems (working around COVID-19 limitations, online learning)
 - A gradual growing of the project
 - Increased support from school leadership



Evaluation



EXTRA RESOURCES





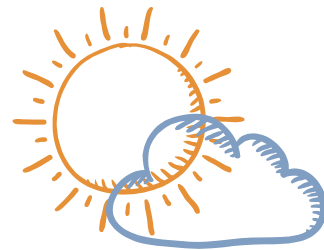
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- X Resize them without losing quality.
- X Change fill color and opacity.
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Examples:



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