

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

NT0820

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

Native-speaking English Teacher Section

Curriculum Development Institute

Education Bureau

What is **HOT** in 21st Century Learning?

Foundational literacies
(language + STEM)

Ability to make connections
between different concepts
and issues

Constellation of Skills

Broad intellectual resources
to draw on

Less tangible creative and
analytical skills, e.g.
leadership and
entrepreneurship

Source: The Economist Intelligence Unit (2017).
Worldwide Educating For the Future Index: A
Benchmark for the Skills of Tomorrow.



“The world doesn’t need more graduates with good grades. What the world needs is voracious, self-directed learners with the creative capacity to see the problems of the world as puzzles, and the tenacity to work on them, even in the face of adversity.”

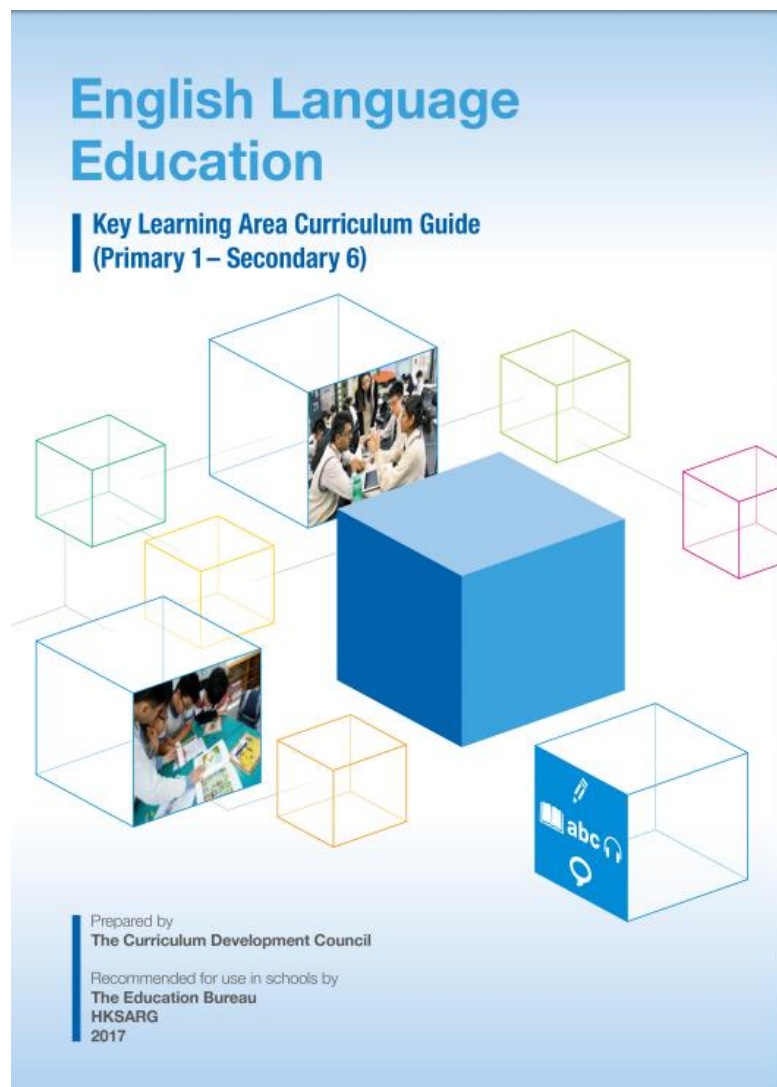
Gever TULLEY, founder of Brightworks School, a San Francisco school that focuses on hands-on education



“Don't ask kids what they want to be when they grow up, but what problems they want to solve. This changes the conversation from who do I want to work for, to what do I need to learn to be able to do that.”

Jaime CASAP, Google Global Education Evangelist

Curriculum Links



Major Renewed Emphases in the ongoing development of English Language Education set out in the latest Curriculum Guide:

- New literacies
- Values education
 - Core Values (Personal): Rationality, creativity
 - Supporting Values (Personal): Self-reflection, self-cultivation, enterprise, etc
 - Core Values (Social): Betterment of human kind, common good
 - Sustaining Values (Social): Rationality, plurality, etc

What is a

MAKER?



Examples of the Maker in You and Me



Interior Design



Personal Accessories



Fashion and Makeup



A Maker is Someone
who Engages in **the Act of Making.**

Making involves...



Choice

Choose to do it

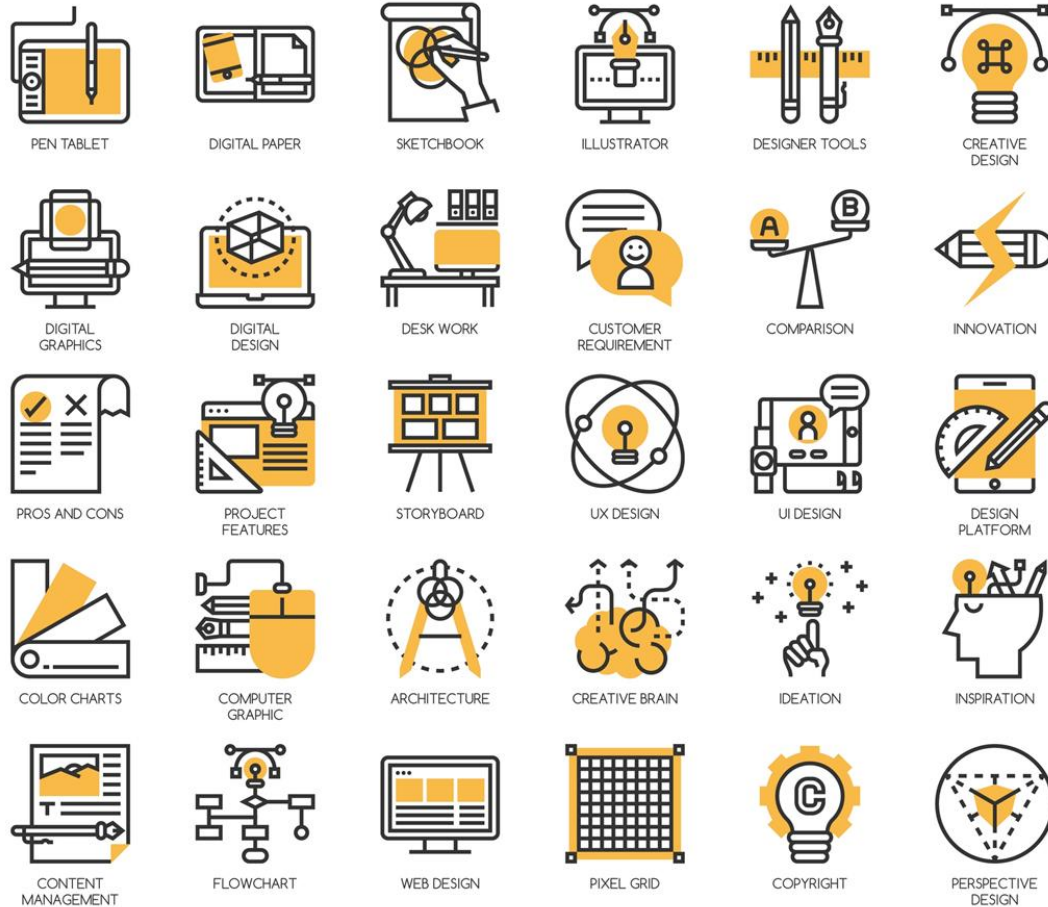
Intention

Want to do it

Action

Do it

Design Thinking



Looking closely

**Exploring
complexities**

**Finding
opportunities**

Design Thinking

“**Design thinking** is a combination of **human-centred**, **inquiry-based scaffolding** and **innovation-friendly mindsets** where students apply **transdisciplinary** knowledge/skills with **creative** practices to **collaboratively** discover **empathetic insights**, generate and explore **radical ideas**, and create, test, and improve **tangible outcomes**; it is having **courage** and attempting to bring **meaningful change** to people’s (or their own) lives, improve real-world experiences, or **develop solutions** to complex problems.”

(Lee, David (2018). *Design Thinking*. Berkeley, CA: Ulysses)

Design Thinking

**Human-
centred**

Inquiry-based

**Innovation-
friendly**

**Transdiscipli-
nary**

Creative

**Empathetic
insights**

Radical ideas

**Tangible
outcomes**

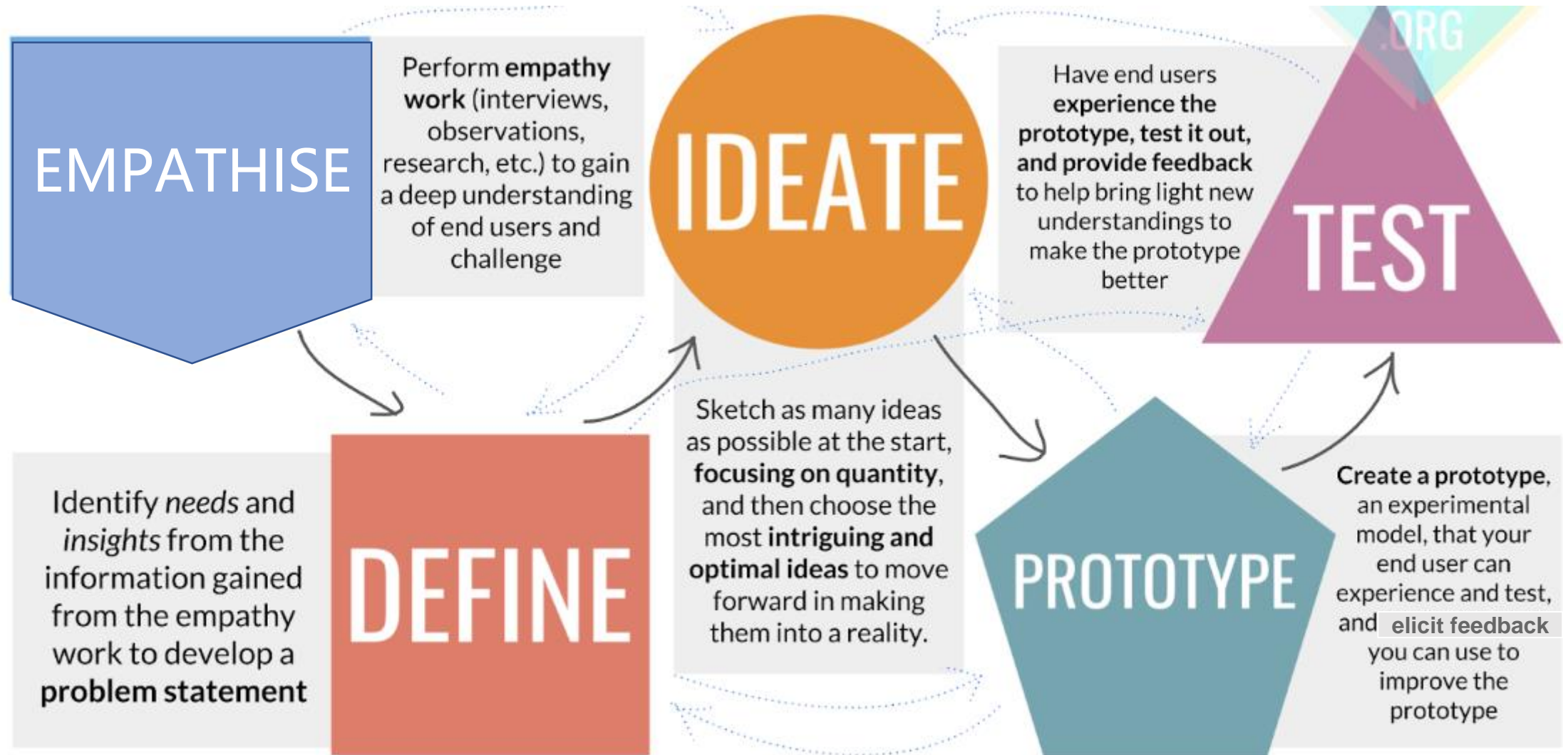
Courageous

Collaborative

**Meaningful
changes**

**Solution-
oriented**

The Process of Design Thinking (Lee, 2018)





Students work together, with or without guidance, to identify problems, brainstorm solutions, evaluate them and action them in their Makerspace journey.



MAKERSPACE ?



What does a Makerspace look like?





**Student Interaction with
“Tools as Teachers”**



Students as Teachers



**Sourcing information
online**



Teachers



Co-inspiration & Co-critique

Knowledge sharing by students

Students figuring it out

Student collaboration facilitated by teachers



**Are Makerspace and English Language Learning
an odd couple?**


**Meaningful and purposeful
communication in English**

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



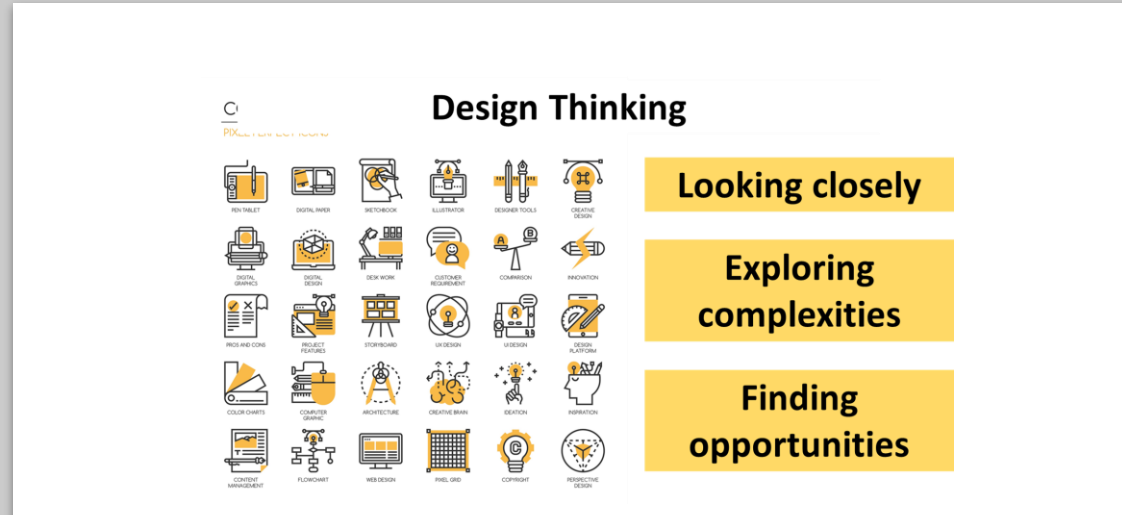
**Using language to facilitate
using the thinking routines**

Can the English Language
Classroom become a Makerspace?



NOT a physical
replication of a
STEM/STEAM-
related Makerspace!

BUT it is a classroom which promotes the following:



The Makerspace / Maker Spirit



Choice

Intention

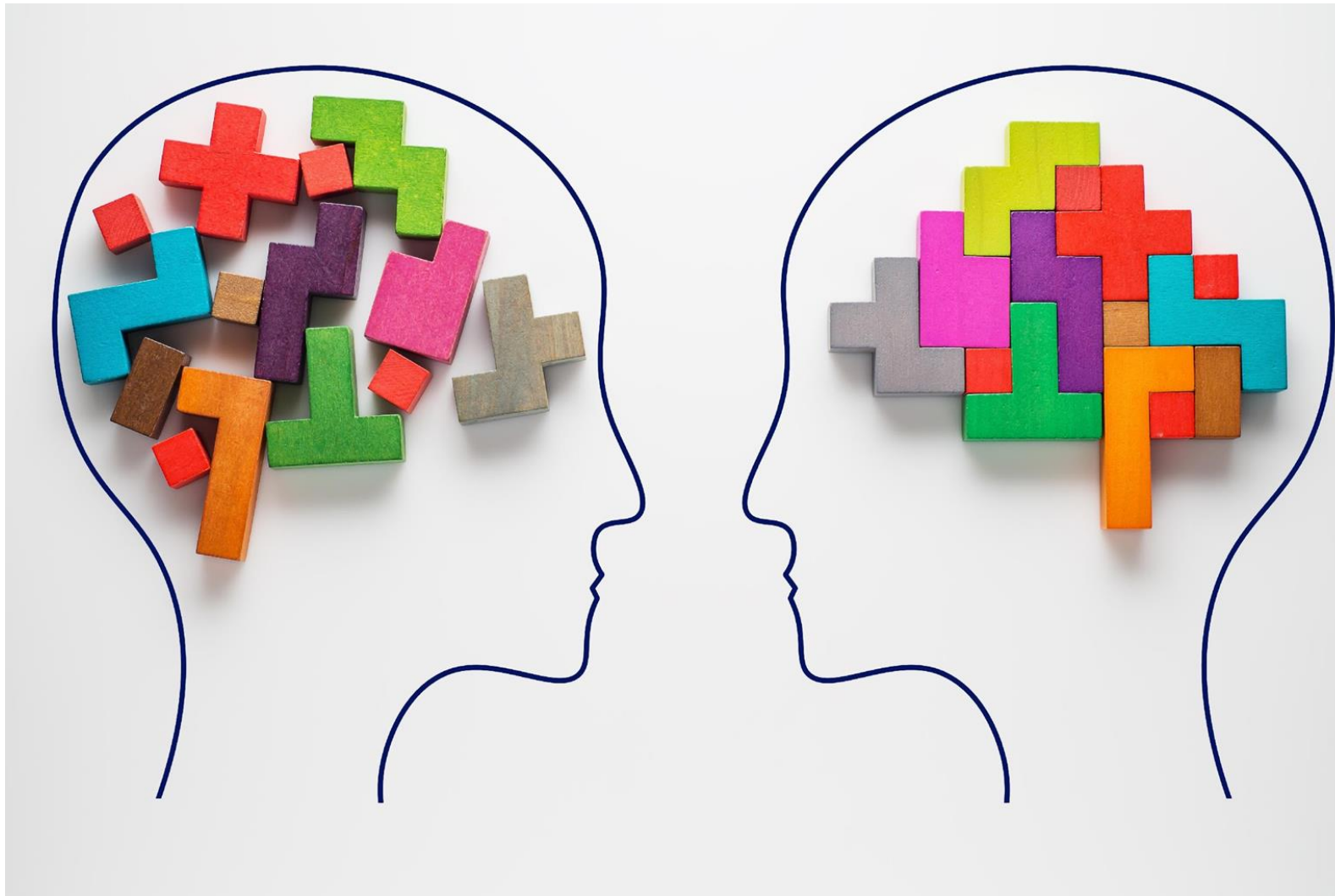
Action



The Maker tools in the English language classroom are made up of...



Language



Thinking Routines

Project Objectives

explore **the place of makerspace** and related skills in the English Language Education Key Learning Area;

develop English language teachers' capacity to identify opportunities in and outside of the classroom where the **makerspace spirit can be cultivated**;

develop teachers' capacity to design **English language learning activities** that support the development of a range of language skills and design thinking, which involves **discovery, creation, creativity, tinkering, experimentation** and **problem solving**;

identify effective **learning and teaching strategies** that empower students to **discover, create, tinker, experiment** and **solve problems** in English language learning; and

develop teachers' ability to **assess students' English language learning and maker-related skills and attitude** in the makerspace context.

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?

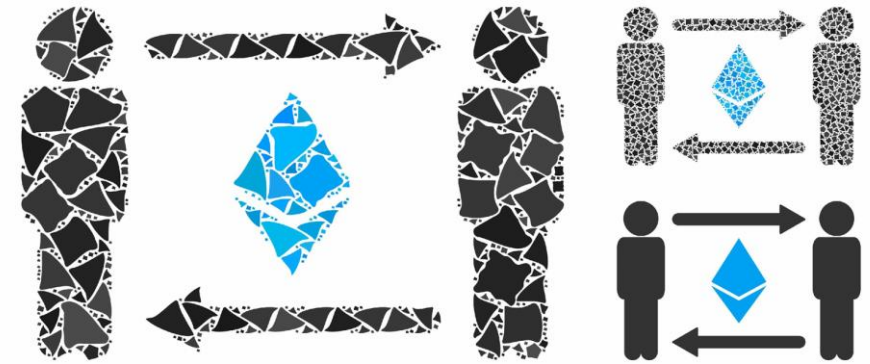


Thinking Routines to Support Learning in a Makerspace

Parts Purposes Complexities



Parts People Interaction



Empathy: Think Feel Care



Parts Purpose Complexities



Focus on an object or system and ask:

- What are its parts?
- What are its purposes?
- What are its complexities?

A modified handout supporting the use of the “Parts, Purposes, Complexities” thinking routines by students



Part of a bike	Function of the part	Complexities
Handlebars	Handlebars are used to...	If the handlebars are too low...
Saddle	The saddle is for...	If the saddle is too high...



Parts People Interaction



Focus on a system and ask:

- What are the parts of the system?
- Who are the people connected to the system?
- How do the people in the system interact with each other and with the parts of the system?
- How does a change in one element of the system affect the various parts and people connected to the system?

Empathy: Think Feel Care



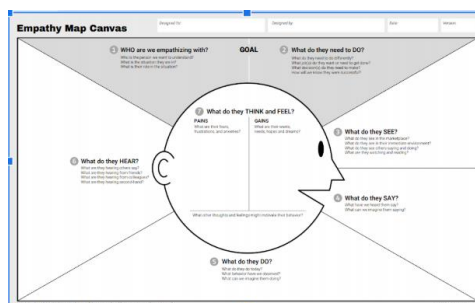
Focus on the people within a system and then step inside each person's Point of View. Consider:

- **Think:** How does each person understand this system and their role within it?
- **Feel:** What is each person's emotional response to the system and to their position within it?
- **Care:** What are each person's values, priorities, or motivations with regard to the system? What is important to this person?

A clip showing how the students of a project school interviewed a biscuit manufacture in a role play situation to find out how she **thinks, feels and cares** about the packaging of the biscuit. Other students in the class were concurrently interviewing a biscuit distributor and a consumer for the same kind of information. They then completed a graphic organiser, an empathy map canvas, using the information gathered.



https://drive.google.com/drive/u/0/folders/17zRY_c-HFjltT9ylpasRUfaKaxxWKReY





Consider the parts, purposes and people who interact with an object or system, and then ask in what ways it could be made:

- more effective?
- more efficient?
- more ethical?
- more beautiful?

Opportunities to practise and language items, e.g.:

- Use of adjectives to describe objects, people, systems, roles, etc.
- Use of the “to-infinitive clause” and “for + gerund” to indicate a purpose
- Use of the relative clauses to provide details
- Use of the second conditional to indicate a hypothetical situation

Parts Purposes Complexities



Parts People Interaction



Empathy: Think Feel Care



Opportunities to practise and use generic skills, e.g.:

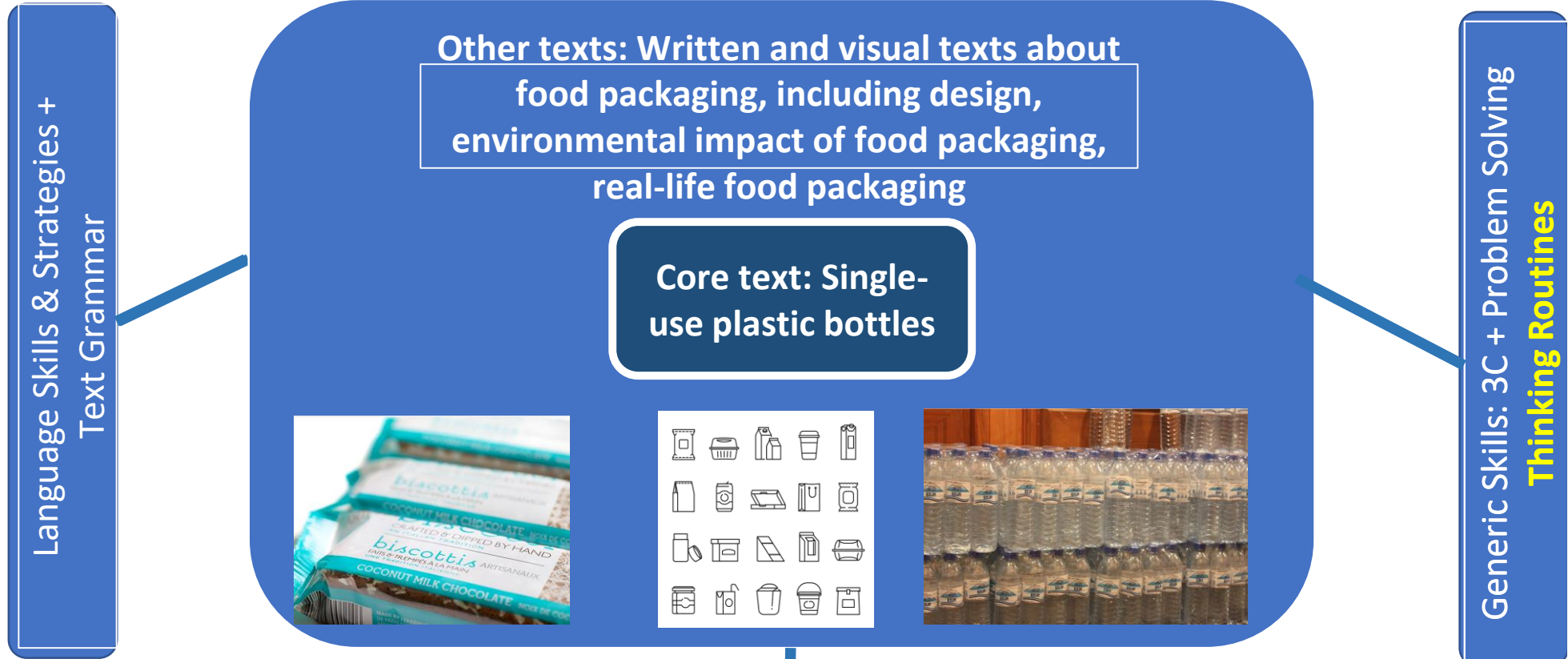
- Critical thinking skills
- Creativity
- Communication
- Collaboration
- IT skills

Opportunities to practise information literacy skills, e.g.

- Researching information about objects, people and systems and perspectives
- Evaluating the information gathered

What a Project Unit May Look Like

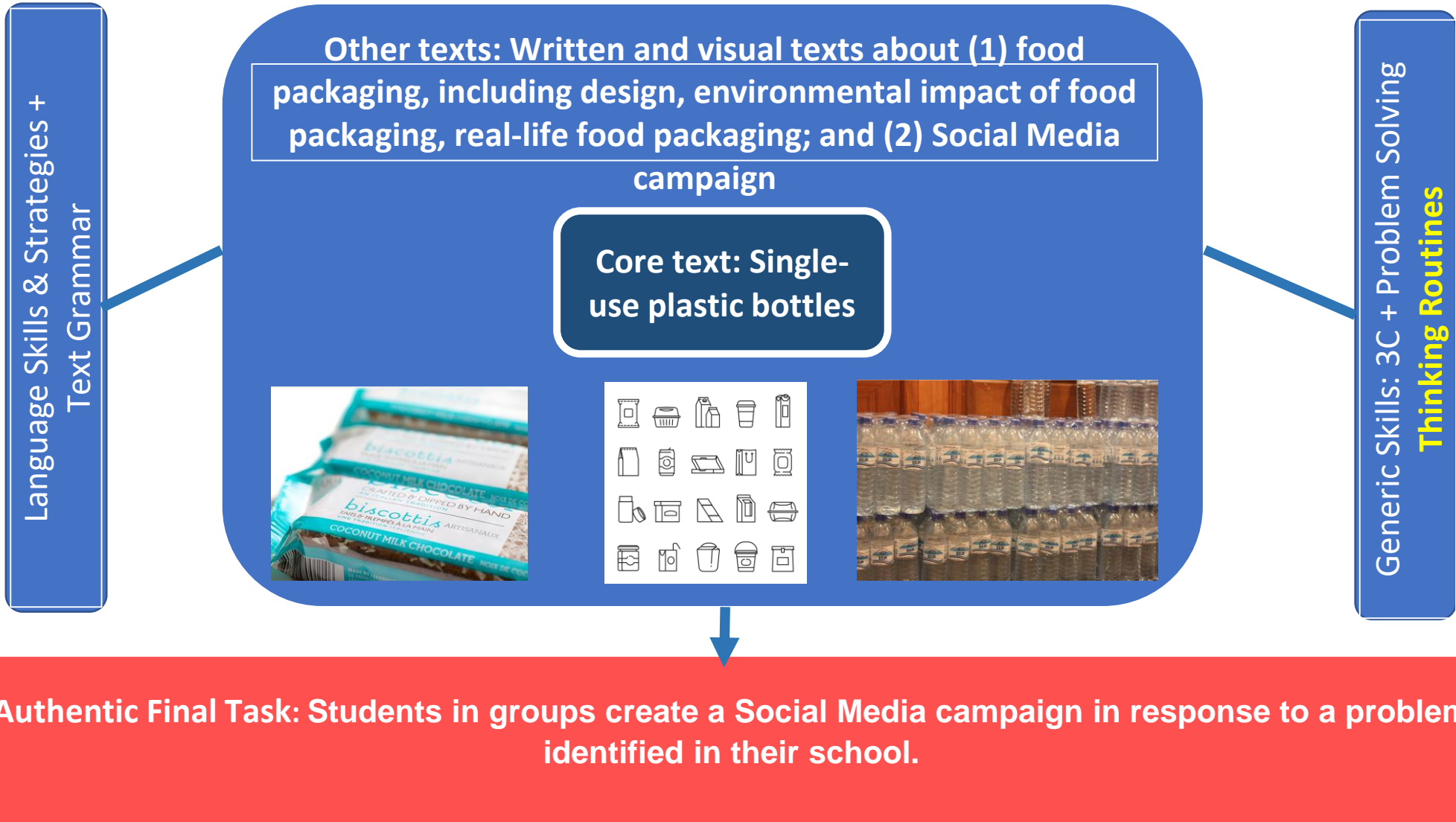
Theme: Environment 1(A)



Authentic Final Task: Students in groups (1) study and discuss real-life packaging of food; (2) interview stakeholders to learn about their views on food packaging; (3) define the issues regarding food packaging; (4) prototype new packaging designs to address the issues; (4) pitch their ideas to a group of stakeholders; and (5) refine the designs based on stakeholders' feedback.

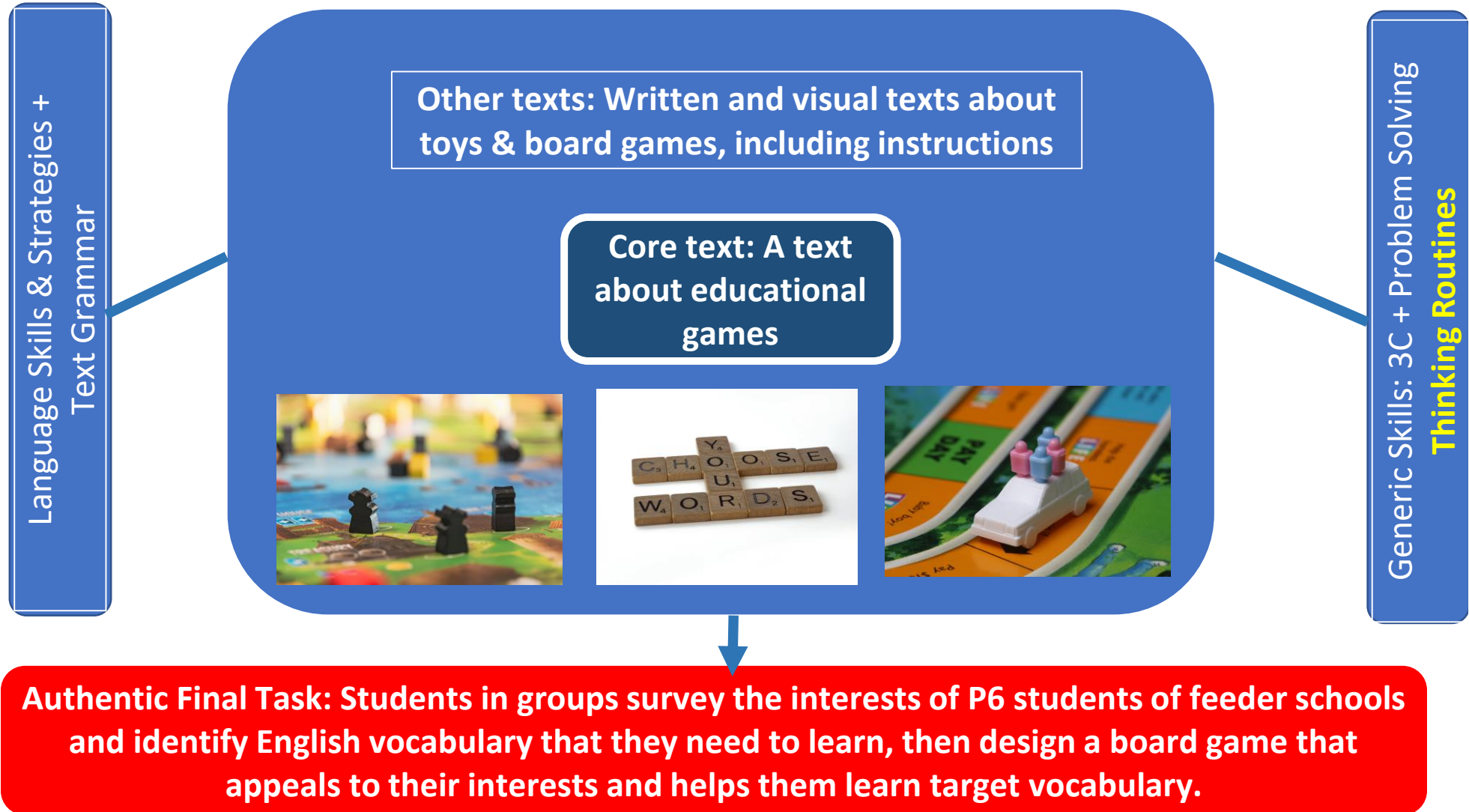
What a Project Unit May Look Like

Theme: Environment 1(B)



What a Project Unit May Look Like

Theme: Games



A Schematic Representation of the Project Focuses

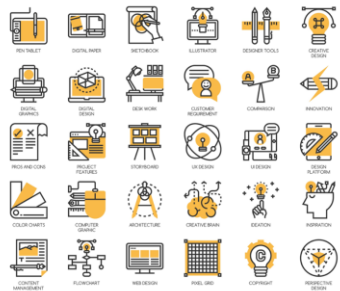
Student Interaction with
“Tools as Teachers”

Students as Teachers

Sourcing information
online

CONCEPT ICONS : DESIGN THINKING

PIXEL PERFECT ICONS

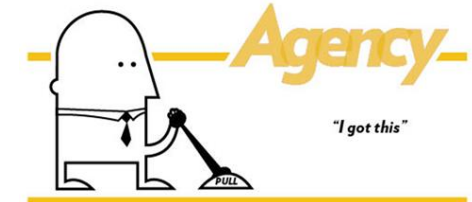
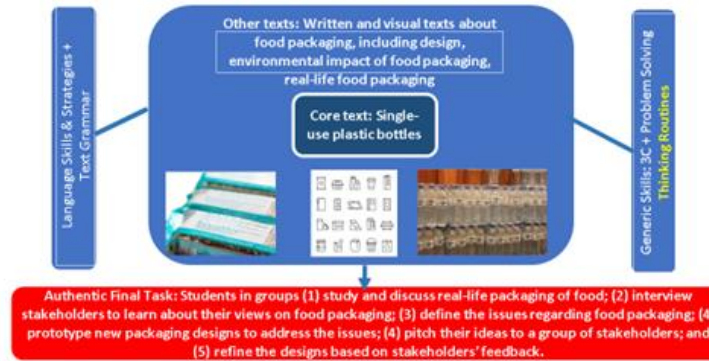


Looking closely

Exploring
complexities

Finding
opportunities

What a Project Unit May Look Like Theme: Environment 1(A)



Choice

Intention

Action

Parts Purposes Complexities



Empathy: Think Feel Care



Parts People Interaction



Co-inspiration & Co-critique

Knowledge sharing by
students

Students figuring it out

Student collaboration
facilitated by teachers



Project Timeline (2020/21)

Jun - Jul 2020

Setting up the support

Sep 2020

**Professional development
Baseline observation and data collection**

Oct 2020 - Mar 2021

**Infusing the thinking routines into the everyday English lessons
Co-planning for a unit of work**

Apr - May 2020

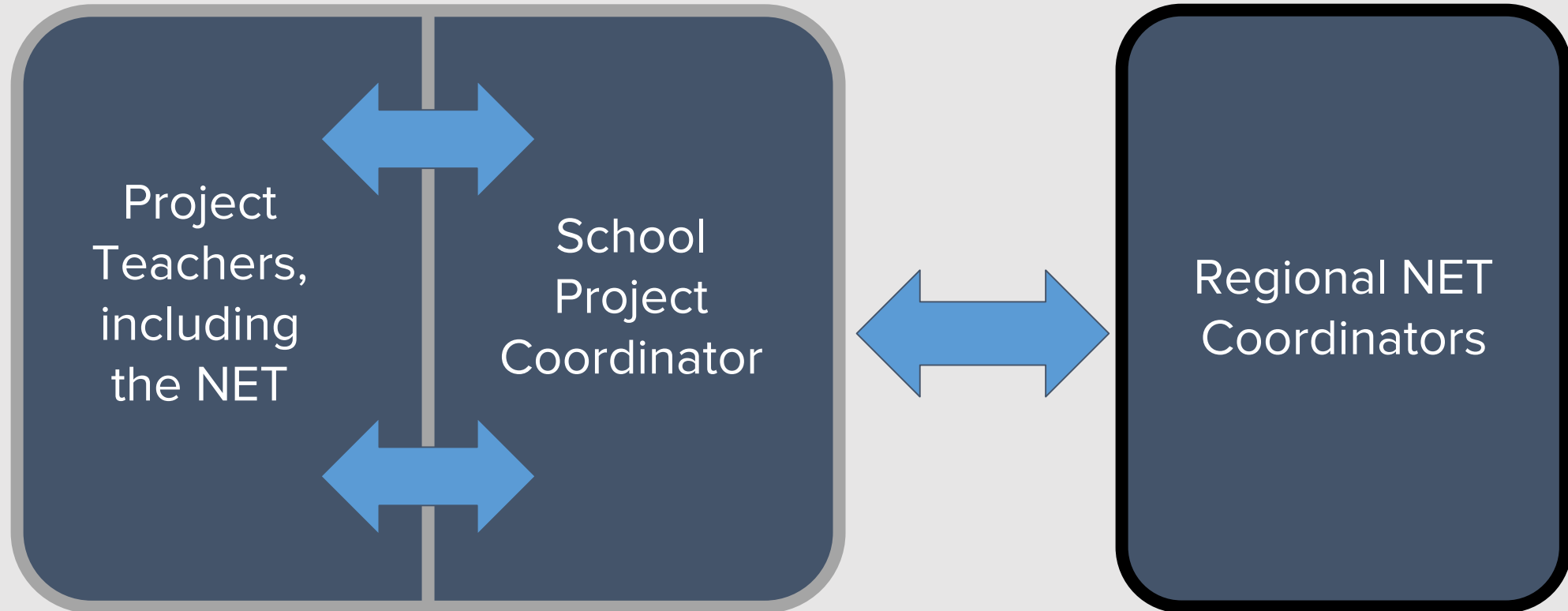
Implementation

May - Jun 2020

**Review
Data collection
Evaluation**

Personnel Involved in the “Seed” Project

Support from the School Senior Management



Project Proposal

Appendix B and Appendix C of the EDB Circular Memorandum No.6/2020

<https://applications.edb.gov.hk/circular/upload/EDBCM/EDBCM20006E.pdf>

**Deadline for submission of application:
9 March 2020**

School Application Form to be completed in duplicate by School Heads and sent to:

**EDB Human Resources
Management Unit at 4/F,
East Wing,
Central Government Offices,
2 Tim Mei Avenue, Tamar**

**Schools wishing to nominate a teacher for secondment to the CDI to this
project is required to complete:
Annex 2 and Annex 3 of Appendix B; and
Part IV of Appendix C.**

Secondment Opportunity

- Half-time secondment (50%), mode negotiable
- Major roles of the seconded teacher
 - To support the planning, implementation and evaluation of the project in the parent school and one other school
 - To compile resources for the development of a resource package
 - To support the planning and delivery of Makerspace-related Centralised Professional Development workshops.
 - To disseminate project experience in the annual experience-sharing session

Enquiry

General

Ms Christy NG

(Life-wide Learning Section)

Tel: 2892 5824

Project-related

Mr William CHENG

(Native-speaking English Teacher Section)

Tel: 3549 8339



YOU DON'T HAVE TO HAVE
A 3D PRINTER TO HAVE
AN AWESOME MAKERSPACE.