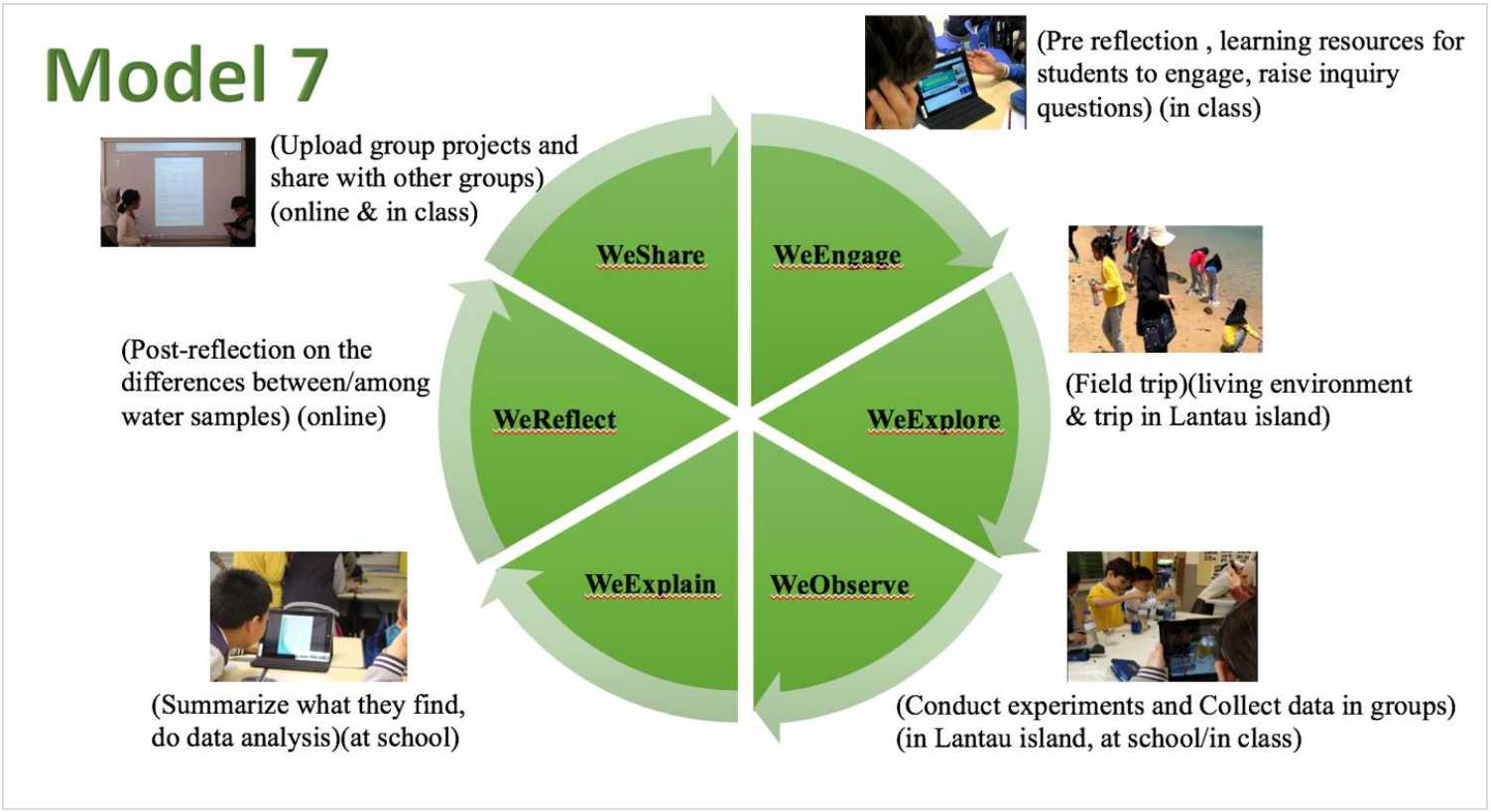
Teaching Plan: Model 7



Grade：Grade 4　　Topic：Investigating water　　Unit: Natural Resources: Water

Book：Learn with me! General Studies 4D　　Teachers in charge：

Prior knowledge:
1. Students have learnt about the natural environment: sea, river, lake, etc.
2. Students can identify resources in daily life (in school, at home and out of doors);
3. Students can identify patterns of water use in the home, school and workplace;
4. Students can identify how to make wise use of water in daily life;
5. Students can operate Google Classroom and some simple application software (Spot-It, Sense-It, Note, SimpleMind, and AR).

- Learning goals: (wise of use of water, the physical properties of water: buoyancy, density, color, 3 states of water: liquid, solid and vapour,)
  1. To further understand the necessity of the wise use of water in daily life;
  2. To recognize and explore ways of water use and its impact on the environment;
  3. To familiarize themselves with the substances that can dissolve in water;
  4. To understand the buoyancy and density of water;
  5. To investigate simple patterns and phenomena related to water (e.g., the water cycles: cloud, rain, water, water vapour…).

Unit:	**Theme:**	**Lesson Duration:**	**Settings**
Natural Resources: Water	Learn with me! General Studies 4D, Our environment, our resources, Investigate water	A week	Lantau island, class/school lab, daily life
Objectives:	**Knowledge**	**Skills**	**Attitudes/values:**
	• To further understand the necessity of the wise use of water in daily life; • To recognize and explore ways of water use and its impact on the environment; • To familiarize themselves with the substances that can dissolve in	• To make wise use of water in daily life; • To plan and carry out interviews or surveys on topic(s) outdoors; • To plan and carry out simple experiments in class/school lab or at home; • To explore the properties of materials (e.g. water, wood, sand, oil, etc.) and compare their differences;	• To appreciate the natural beauty and resources in Lantau island; • To demonstrate an interest in exploring our environment and show commitment to environmental conservation and the wise use of natural resources; • To develop a proper attitude towards water consumption;

	water; • To understand the buoyancy and density of water; • To investigate simple patterns and phenomena related to water.	• To acquire scientific inquiry skills, and make comparisons; • To conduct observations and make interpretations; • To reflect, defend, report and/or share investigation process, results (scientific explanations). • To assess collaborative problem solving and self-directed learning skills (21st century skills)	• To make wise decisions and inferences based on sound evidence.

Pedagogical design: Investigating water

Activities (As)	lessons	Description	Knowledge	Skills	Technology
A 1 Engage (in class)	e.g. 1 lesson	**Engage:** Pre-reflection: Q1: What do you know about the water use in your daily time or at school? Do you think you use it wisely? Draw a concept map using SimpleMind to show what you know about it. Q2: What problems do you want to explore about water use in Lantau island? Q3: What substances can dissolve in water, and what cannot? Do you know about the properties of water? (e.g. density, buoyancy, color, and physical properties…) **Provide learning resources** for students (e.g. online resources or ask the students to observe the use of water around them, then raise questions to explore: e.g. • What is the current situation of water use in Lantau island? What problems do they want to know about? Is there any difference in water use between school, home and other public places? • What are the sources and quality of water in Lantau island • What are the differences between water from different sources in Lantau island? • What properties of water do you want to explore/compare? • What are the phenomena related to the water? …	Prior knowledge of wise use of water in daily life; property of water	Reflective skills	**GoogleClassroom**: The teacher can upload relevant resources, lesson objectives/ requirements etc. to the platform; students can share their views and pictures and make comments; **Note**: pre-reflection (you can either ask the students to do the reflection using paper and pen or ask them to make recordings/video of their reflections or write their reflections and upload them to Note. **SimpleMind:** As for the concept map, they can draw it using SimpleMind and upload it to Note. **Camera**: they can take pictures of the living things and the environment around them related to the topic. **Recording**: for reflection **Video**: they can also make video clips about the water sources, their inquiry process

		Generation: Raise their inquiry questions: What are their hypotheses/questions/problems about water?			and their group activity
A 2a Explore (trip in Lantau island,)	e.g. 1 day in Lantau island	• Explore the current situation of water use in Lantau island with problems/hypotheses/questions they discussed in groups. • Explore the sources, environmental phenomena, and quality of water in Lantau island. • Explore the differences between water from different sources in Lantau island. • **Plan** how to explore their questions/problems/hypothesis ■ What problems to investigate? (e.g. Water consumption; Patterns of water use; Consciousness of water conservation; Where does water supply come from in Lantau island? Purification of water; what should we do before drinking water from the tap?) ■ What tools do they need to prepare? (Containers, mobile devices, notebooks, recorders, etc.) ■ What scientific methods to be adopted? (Interview, observe, record, survey…) ■ …	Scientific/ inquiry methods	Collaborat -ive skills	1. Google Classroom: Discuss with group members how to do the inquiry either face-to-face or on Google Classroom.
A 3a Observe (in Lantau island)		**Collect data** in groups: take photos, recordings (The teacher can prepare an observational table with key things to observe and key things to take record), and upload them to Google Classroom (in groups but other groups can see and give comments). Students also share other information about the growth of the plant on Google Classroom in the public area and comment on other's work.	Scientific/ inquiry methods	Data collection skills	**GoogleClassroom**: students can share artifacts on the platform if they want or make comments **Camera/Note**: Document the surroundings of water sources (making video clips with sound description); pictures **Recording**: whatever they want to record.

					AR: Students can make use of the video recording of the investigation to make AR projects
A 2b Explore (at school/in class)	e.g. 1-2 lessons	• Explore the difference between/among water collected from different sources in Lantau island (and school/other places in HK). • Explore the properties of water. • **Plan** how to explore the properties of the water samples. ■ What properties of water do they want to explore/compare? (Density, dissolving, color, pH, etc.) (Borrow handheld sensors from SES) ■ Labor division. What tools do they need to prepare? (For experiments: beakers, several substances (e.g, sand, sugar, salt, wood, iorn, oil, coloring), rulers for comparison, balance or gravity meters (Density x Volume = Mass), handheld sensor (pH, CO2, O2) (can borrow from SES), etc. For recording and sharing: mobile devices, notebooks, recorders, etc.) ■ What methods/skills? (Control variables, observe, record …) ■ How to make water samples clean? What instruments or materials to DIY? ■ What problems they encounter and how to solve them? ■ Redesign the experiment ■ …	Density x Volume = Mass; Optional: water treatment, water purification; pH, CO2, O2, the quality of water is different due to their chemical properties	Collaborative skills, communication, Collaborative problem solving; self-directed learning;	**Google Classroom**: Discuss with group members how to do the inquiry either face to face or on Google Classroom.
A 3b Observe (at school/in class/in lab)		**Conduct** experiments and Collect data in groups: experiment, take photos, recordings (The teacher can prepare an observational table with key things to observe and key things to take record), and upload them to Google Classroom (in groups but other groups can see and give comments). Students also share other information	Properties of water Optional: water	Collaborative skills, communication, Collaborat	**Google Classroom**: students can share artifacts on the platform if they want or make comments **Camera/Note**: Document the

		about the experimental results (e.g. property of water, quality of water) on Google Classroom in the public area and comment on other's work. Try to prepare/make simple *water filter (treatment device)* for the water sample treatment (sedimentation, then filtration) (materials BYO). Compare the water before and after the treatment. Compare the self-made devices with other groups.	treatment, simple water purification experiments	ive problem solving; self-directed learning; practical skills	experimental process and the scientific phenomena Recording: whatever they want to record/video record; **Camera**: Take photos of team work in experiment; **Recordings**: Taking recordings of the inquiry process and upload them to Google Classroom **AR:** Students can make use of the video clips of inquiry process and make AR projects Note: Keep Daily record of the investigation
A 4 (Explain) (at school)		Summarize what they find, do data analysis (tables, graphs, pictures) Present results [see whether students can integrate the knowledge regarding science, technology, engineering (may not have), mathematics and language (use language to present) together].			Groups can prepare how to integrate and present the results and make a short video
A 5 Reflect (online)		Reflect on the guided questions in Note, e.g., Q3: What have you learned about the properties of water (e.g. the differences between/among water samples)?			• Note • SimpleMind
A 6 Share (online & in class)		The students upload their AR projects to Google Classroom in groups and share with other groups; they can comment on each group's work; they also share their work face-to-face in class for evaluation.			• Google Classroom • AR projects