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Supervisor: Dr. Lam Bick Har

Subject:	Liberal Studies	Year Group:	Secondary 3 (24 students)
Topic:	Renewable Energy - Solar energy in Hong Kong	Duration:	60 mins (Single Lesson)

### **Prior Request:**

Teacher informed the debate content, such as student role in the debate to encourage them in searching the related information. Students will also be encouraged to participate in the online learning games which are related to renewable energy.

### **Prior Knowledge**

1. Basic understanding of the different sources of energy that we are using in daily lives
2. Basic knowledge of different types of renewable and non-renewable energy
3. Basic concepts on the application of renewable energy in Hong Kong

### **Learning Objectives**

Students will be able to:

1. Describe the source and use of solar energy
2. Compare the advantages and disadvantages of solar energy
3. Apply the knowledge about the usage of solar energy to contemporary Hong Kong
4. Develop a sense of reserving energy

### Teaching Strategies

Cooperative Learning /Jigsaw Method: Debate

Critical Thinking: Debate

Online Learning (SAVE THE WORLD - GAME)

### Teaching Skills



Skill of Questioning: Teaching guiding question in the discussion stage


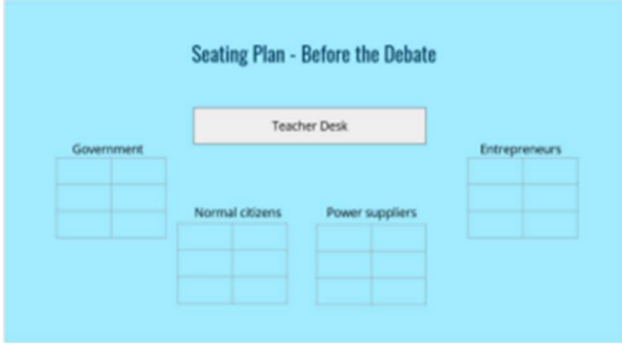
Skills of Using IT: Padlet/ Mentimeter

### Procedure

Time (minutes)	Objectives	Teaching Materials	Teaching strategies and steps
2	<p><b>Recap</b></p> <p>Learning Objectives 1: Describe the source and use of solar energy</p>	<p>1.TLS3008 Lesson PPT.pptx (p.1-3)</p>	<p><b>Steps:</b></p> <p>Inform students that this lesson's learning objectives and the sessions of this lesson</p> <p><b>Strategies:</b></p> <p>Online Learning (SAVE THE WORLD - GAME)</p>


		<p>Online Learning (SAVE THE WORLD - GAME)</p> <p>What have you learned from the game?</p> <p><a href="https://www.pearson.com/asset/save-the-world">https://www.pearson.com/asset/save-the-world</a></p>							
5	<p>Learning Objectives 1: Describe the source and use of solar energy</p> <p>Learning Objectives 3: Apply the knowledge about the usage of solar energy to contemporary Hong Kong</p>	<p>1.TLS3008 Lesson PPT.pptx (p.4-5)</p> <p>Renewable energy and Non-renewable energy</p> <table border="1"> <thead> <tr> <th>Renewable energy</th> <th>Non-renewable energy</th> </tr> </thead> <tbody> <tr> <td>Keeps generating in nature</td> <td>Limited supply on Earth</td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>- Solar Energy</li> <li>- Geothermal Power</li> <li>- Biomass Energy</li> <li>- Hydro Energy</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>- Natural Gas</li> <li>- Coal</li> <li>- Oil</li> </ul> </td> </tr> </tbody> </table> <p>2.Lesson Note.doc</p>	Renewable energy	Non-renewable energy	Keeps generating in nature	Limited supply on Earth	<ul style="list-style-type: none"> <li>- Solar Energy</li> <li>- Geothermal Power</li> <li>- Biomass Energy</li> <li>- Hydro Energy</li> </ul>	<ul style="list-style-type: none"> <li>- Natural Gas</li> <li>- Coal</li> <li>- Oil</li> </ul>	<p><b>Steps:</b></p> <p><b>Recap of the prior knowledge:</b></p> <ol style="list-style-type: none"> <li>1. Definition of renewable energy and non-renewable energy</li> <li>2. Different sources of energy that we are using in Hong Kong</li> </ol> <p><b>Strategies:</b></p> <p>Pre-test - solar energy in Hong Kong, assure students broad knowledge of applying the knowledge before activity.</p>
Renewable energy	Non-renewable energy								
Keeps generating in nature	Limited supply on Earth								
<ul style="list-style-type: none"> <li>- Solar Energy</li> <li>- Geothermal Power</li> <li>- Biomass Energy</li> <li>- Hydro Energy</li> </ul>	<ul style="list-style-type: none"> <li>- Natural Gas</li> <li>- Coal</li> <li>- Oil</li> </ul>								

		<p style="text-align: center;">TLS3008 Powerful Five S3 Liberal Studies Introduction to solar energy (Student Note)</p> <p>Name: _____ Class: _____ Date: _____</p> <p><b>1. Recap:</b> The use of energy is one of the essential parts of our life. In modern society, we could not live without energy.</p>  <p>Can you name some types of energy that we are using? _____</p> <p>Do you still remember the definition of renewable and non renewable energy?</p> <ul style="list-style-type: none"> <li>- Renewable energy: _____</li> <li>- Non renewable energy: _____</li> </ul> <p><b>2. Solar Energy</b></p>	
<p>8</p>	<p><b>Solar Energy &amp; Pre-test</b></p> <p>Learning Objectives 1: Describe the source and use of solar energy</p> <p>Learning Objectives 2: Compare the advantages and disadvantages of solar energy</p> <p>Learning Objectives 3: Apply the knowledge about the usage of solar energy to contemporary Hong Kong</p>	<p>1. TLS3008 Lesson PPT.pptx (p.8- 14)</p>  <p>2. Lesson Note.doc</p> <p>3. Video - Solar energy in Hong Kong <a href="https://www.youtube.com/watch?v=nuUzEyN2-SU&amp;feature=emb_title">https://www.youtube.com/watch?v=nuUzEyN2-SU&amp;feature=emb_title</a></p>	<p><b>Teaching the main concepts (Key teaching points):</b></p> <p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1 Advantages of solar energy</li> <li>· Disadvantages of solar energy</li> <li>2 Current usage of solar energy in Hong Kong</li> <li>·</li> <li>3</li> <li>·</li> </ol> <p><b>Strategies:</b> Mandala Thinking - solar energy in Hong Kong)</p>

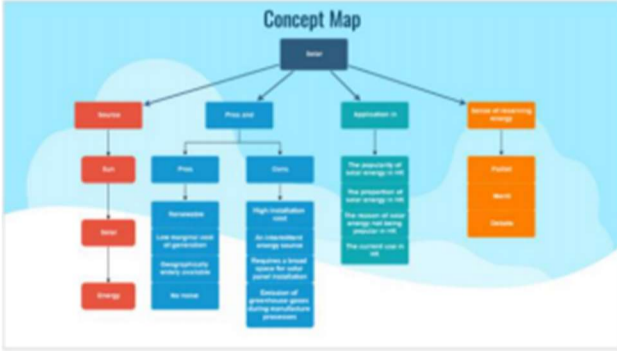
		 <p>Hong Kong: Renewable Energy (RTHK) 03:50 - 06:00</p>	
<p>2</p>	<p><b>Debate introduction &amp; preparation</b></p> <p>Learning Objectives 1: Describe the source and use of solar energy</p> <p>Learning Objectives 2: Compare the advantages and disadvantages of solar energy</p> <p>Learning Objectives 3: Apply the knowledge about the usage of solar energy to contemporary Hong Kong</p>	<p>1.TLS3008 Lesson PPT.pptx (p.18 and 21)</p> 	<p><b>Steps:</b></p> <p>Divide the students into 4 groups for debating, assign each group with a role (Government, normal citizens, power suppliers, entrepreneurs)</p> <p><b>Topic: Should solar energy be widely used in Hong Kong?</b></p> <p><b>Strategies:</b></p> <p>Jigsaw Method</p>
<p>7</p>	<p>Learning Objectives 1: Describe the source and use of solar energy</p> <p>Learning Objectives 2: Compare</p>	<p>1.Cue cards</p> <p>2.TLS3008 Lesson PPT.pptx (p.15-17)</p>	<p><b>Steps:</b></p> <p><b>Inform the rules of the debate:</b></p> <p>1. Participants are required to have three rounds (2</p>

	<p>the advantages and disadvantages of solar energy</p> <p>Learning Objectives 3: Apply the knowledge about the usage of solar energy to contemporary Hong Kong</p>	 <p><b>The Rules of the Debate</b></p> <ol style="list-style-type: none"> <li>1. Participants are required to have <b>three rounds</b> (2 mins for each round) of debate between groups, including introduction and grand crossfire.</li> <li>2. After a group of classmates expressed their opinions, the other group of students <b>should comment on those ideas first, then share their stance.</b></li> <li>3. Students have a <b>total of 12 minutes</b> to speak.</li> <li>4. Other groupmates <b>need to jot down the arguments</b> suggested by adjacent parties into the working paper and provide the information for the inquiry from the next round of students.</li> </ol>	<p>mins for each round) of debate between groups, including introduction, rebuttals, and grand crossfire.</p> <ol style="list-style-type: none"> <li>2. After a group of classmates expressed their opinions, the other group of students should comment on those ideas first, then share their stance.</li> <li>3. Students have a total of 12 minutes to speak.</li> <li>4. Other groupmates need to jot down the arguments suggested by adjacent parties into the working paper and provide the information for the inquiry from the next round of students.</li> </ol>
8	<p><b>Collecting ideas before the debate - Padlet</b></p> <p>Learning Objectives 1: Describe the source and use of solar energy</p> <p>Learning Objectives 2: Compare the advantages and disadvantages of solar energy</p> <p>Learning Objectives 3: Apply the knowledge about the usage of solar energy to contemporary Hong Kong</p>	<ol style="list-style-type: none"> <li>1. Padlet: <a href="https://padlet.com/s1128390/yj5eaqf9fdmt">https://padlet.com/s1128390/yj5eaqf9fdmt</a></li> <li>2. TLS3008 Lesson PPT.pptx (p.19)</li> </ol>  <p><b>Padlet</b></p> <p>What do you think about the current situation in Hong Kong?</p> <p>Organize your arguments and evidence, and then insert them in the Padlet.</p>	<p><b>Steps:</b></p> <p>Discussion for students to organize their arguments and evidence, and then insert them in the smartphone for showing their arguments to other groups.</p> <p><b>Strategies:</b></p> <ol style="list-style-type: none"> <li>1. Teacher guiding question - e.g. what do you think about the current situation in Hong Kong?</li> <li>2. E-learning</li> </ol>

13	<p><b>Debate</b></p> <p>Learning Objectives 1: Describe the source and use of solar energy</p> <p>Learning Objectives 2: Compare the advantages and disadvantages of solar energy</p> <p>Learning Objectives 3: Apply the knowledge about the usage of solar energy to contemporary Hong Kong</p>	<p>1.Cue cards 2.TLS3008 Lesson PPT.pptx (p.20)</p>	<p><b>Steps:</b> <b>Debate session</b></p>
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<p>7</p>	<p><b>Conclusion - Mentimeter (collecting ideas after the debate)</b></p> <p>Learning Objectives 1: Describe the source and use of solar energy</p> <p>Learning Objectives 2: Compare the advantages and disadvantages of solar energy</p> <p>Learning Objectives 3: Apply the knowledge about the usage of solar energy to contemporary Hong Kong</p>	<p>1.Mentimeter:(link) 2.Students' smartphone/tablet 3.TLS3008 Lesson PPT.pptx (p.22)</p>  <p>The image shows a blue banner for a Mentimeter poll. It contains the text: 'Student Opinions', 'Please go to <a href="http://www.menti.com">www.menti.com</a> to vote and express your opinions', and 'Code: 32267'. To the right of the text is a QR code. Below the text is a small green leaf icon.</p>	<p><b>Steps:</b> <b>Assess student opinion after the debate.</b></p> <p>Voting of the students for the final stance of the debate topic and description of solar energy:</p> <p><b>Question 1:</b> Do you agree that solar energy should be widely used in Hong Kong? <b>Options:</b> a) Agree b) Disagree</p> <p><b>Question 2:</b> Which stakeholder(s) give the most convincing point or view? <b>Options:</b> a) Government b) Normal citizens c) Powersuppliers d) Entrepreneurs</p> <p><b>Question 3:</b> Give a word to describe solar energy in Hong Kong.</p> <p>Students have to peer-evaluate their classmates using classroom debate rubric.</p> <p><b>Strategies:</b></p> <ol style="list-style-type: none"> <li>1. E-learning</li> <li>2. Giving Feedback</li> </ol>
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<p>8</p>	<p><b>Conclusion</b></p> <p>Learning Objectives 1: Describe the source and use of solar energy</p> <p>Learning Objectives 2: Compare the advantages and disadvantages of solar energy</p> <p>Learning Objectives 3: Apply the knowledge about the usage of solar energy to contemporary Hong Kong</p> <p>Learning Objectives 4: Develop a sense of reserving energy</p>	<p>TLS3008 Lesson PPT.pptx (p.23)</p>  <p>The concept map shows 'Solar' at the top, branching into 'Source', 'Uses', 'Advantages', and 'Disadvantages'. 'Source' leads to 'Sun' and 'Energy'. 'Uses' leads to 'Photovoltaic', 'Solar Water Heating', and 'Solar Drying'. 'Advantages' lists 'The abundance of solar energy in HK', 'The freedom of using solar energy in HK', and 'The relatively low cost of it'. 'Disadvantages' lists 'The high initial cost of equipment', 'The dependence on weather conditions', and 'The limited space for solar panels'.</p>	<p><b>Steps:</b></p> <p>Conclusion and Retention:</p> <ol style="list-style-type: none"> <li>1. Summarize all the advantages and disadvantages of solar energy</li> <li>2. Introduce the concepts of energy reserving to students (In spite of solar energy, some of the energy are limited and cannot be renewed)</li> </ol> <p><b>Strategies:</b></p> <ol style="list-style-type: none"> <li>1. Jigsaw Method - Testing, test student knowledge of the topic after the lesson</li> <li>2. Jigsaw Method - Group recognition</li> <li>3. Concept Mapping</li> </ol>
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## Teaching Materials

Items	Amount
Lesson Powerpoint	1
In-class notes	30 (24 student copy + 6 reserve)
Video - Solar energy in Hong Kong	1
Cue cards	30 (24 student copy + 6 reserve)
Classroom Debate Rubric	1
Concept Map	1
Website - Padlet webpage link	1
Website - Mentimeter webpage link	1