

Kau Yan College

e-Life@KYC

S.1 Unit 5 Energy: Microwavable Heat Bag - Lesson Plan

Lesson	Strategies	Contents	Activities	Remarks
Pre-class		Tailor-making a heat bag	Each student should tailor-make their own heat bag by choosing different sizes (small, medium, large) / materials (thin cotton / thick cotton / thick cotton with coating)	To be completed in Home Economics
1 st – 2 nd	Engage Goal-setting Self-planning	Introduction of heat bags Finding a suitable temperature range for the heat bag Planning for the scientific investigation Introduction of the proper use of microwave oven	Activity 1: Read an article about the commercial heat bags that can be found in the market <i>Guiding Questions: Alternatives of commercial heat bags → microwavable heat bag using red beans</i> Activity 2: Determine a suitable range of temperature with experiments and whole-class polling Activity 3: Determine the I.V. and D.V. within each group and construct a table for recording the results Activity 4: Understand the use of microwave oven	Remind students the pollution problem on disposing the commercial heat bags (e.g. iron powder) Range: the highest temperature that the users are comfortable with & the lowest temperature that the users still feel warm enough <u>(Informed criteria obtained from all students)</u> (suggested temperature range from previous cohorts: 40°C – 52 °C) Remind students the safety precautions on using the microwave oven
3 rd – 4 th	Explore Self-monitoring Explain	Scientific investigation on the heat release of the tailor-made microwavable heat bag	Activity 5: With the use of students' tailor-made heat bag, carry out investigation on the effect of (1) the sizes of heat bag or (2) the materials of the heat bag on the temperature change of the surface of the microwavable heat bag. Given: 70g red beans, 700W and 20s for microwaving (Controlled variables)	Students design the setup of the measurement using stand and clamp, thermometer, a wooden block and a clip Students calculate % change of temperature Students draw conclusion on which size / material (I.V.) is better for the efficacy of their microwavable heat bags

	<p>Self-evaluation</p> <p>Evaluate</p> <p>Revision</p>		<p>Activity 6: Analyze and discuss the finding in whole-class manner with the use of Microsoft Excel: Students from each group share the data into online Excel Form</p> <p>Activity 7: Students evaluate their learning process during the scientific investigation</p> <p>Activity 8: Revise the microwavable heat bags: determine how to revise the microwavable heat bags provided that their size and material remain unchanged</p>	<p>Teacher helps students to construct graphs in Excel for <u>analyzing and informing whole-class decision on which combination is the best for the heat bag</u></p> <p>Use of PowerLesson2 online platform</p> <p>Identify variables with the help of fishbone conceptual framework</p>
5 th – 6 th	Elaborate	Construction of user manual	<p>Activity 9: Discuss and answer the guiding questions for making a user manual suitable for elderly</p> <p>Activity 10: Design and make a user manual suitable for elderly</p>	<p>Scientific investigation informs engineering design</p> <p>Remind students (per group) to prepare a 2-minute video for the presentation of the microwavable heat bags and user manual and share it in the PowerLesson2 platform</p>
Post-class	<p>Evaluate</p> <p>Self-evaluation</p> <p>Revision</p>	Evaluation	<p>Activity 11: Evaluate the 2-minute video of the presentation on the introduction of the microwavable heat bags and the user manuals</p> <p>Ask parents / grandparents to evaluate the tailor-made microwavable heat bag and its user manual</p>	<p>Ask students to evaluate other students' products through watching the 2-minute videos and studying the user manuals from the other group</p> <p>Ask and guide parents / grandparents to use the microwavable heat bag with the use of the user manual</p> <p>Further revise the microwavable heat bag and user manual</p>