香港教育大學
The Education University of Hong Kong

FACULTY OF LIBERAL ARTS AND SOCIAL SCIENCES
博文及社會科學學院

科學與環境學系
Department of Science and Environmental Studies

2023-2024 Quality Education Fund Thematic Network - Tertiary Institutes

STEAM Education with Self-directed and Progressive Learning of Engineering Design Process for Problem-solving

透過STEAM教育自主及循序漸進學習以工程設計流程解難

水冷式散熱器

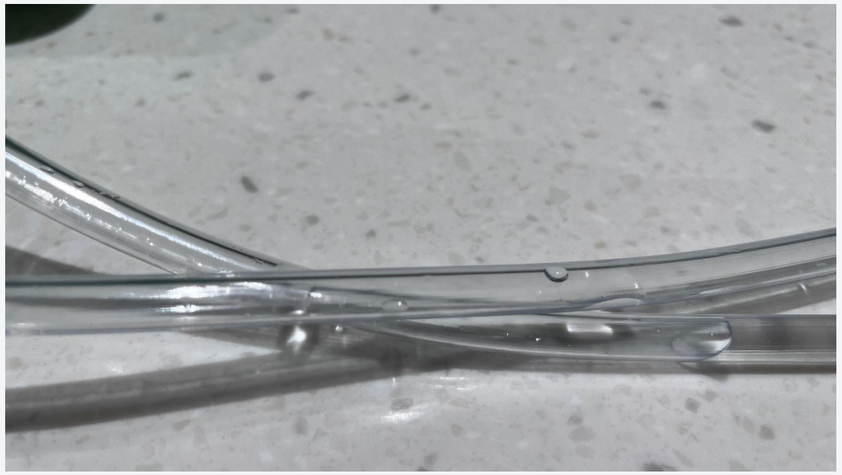
荃灣天主教小學Tsuen Wan Catholic Primary School

OBJECTIVES OF EXPERIMENT 1

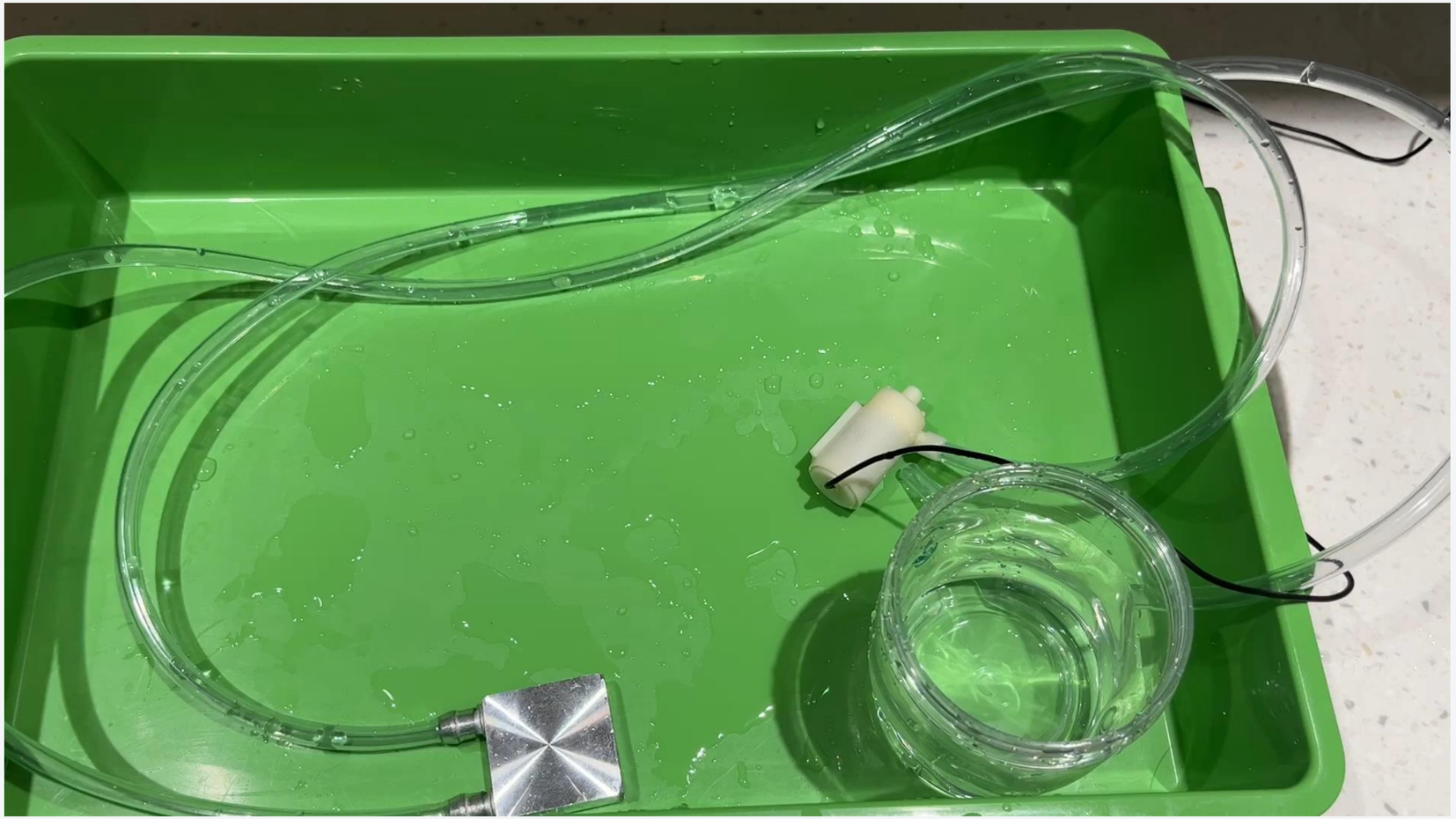
- To observe the temperature change of a glass of hot water after using water cooling system

EXPERIMENT MATERIAL

- 水冷頭
- 水管
- 水管卡扣
- 馬達



Demo Video



RESULT

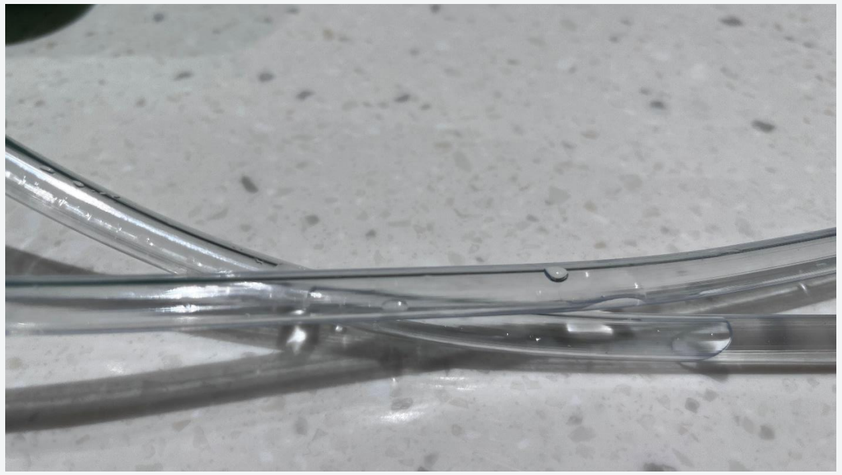
Independent variable	Control set-up	Experimental set-up
1 min (no water)	/	Before: 24.7˚c After: 23.7˚c Change: -1˚c %: -4.04%
1 min 150mL hot water	Before: 74˚c After: 67.6˚c Change: -6.4˚c %: -8.64%	Before: 74.1˚c After:43.8˚c Change: -30.3˚c %: -40.8%
5 mins 250mL hot water	Before: 81.3˚c After: 73.1˚c Change: -8.2˚c %: -10%	Before: 80˚c After: 37.6˚c Change: -42.4˚c %: -53%

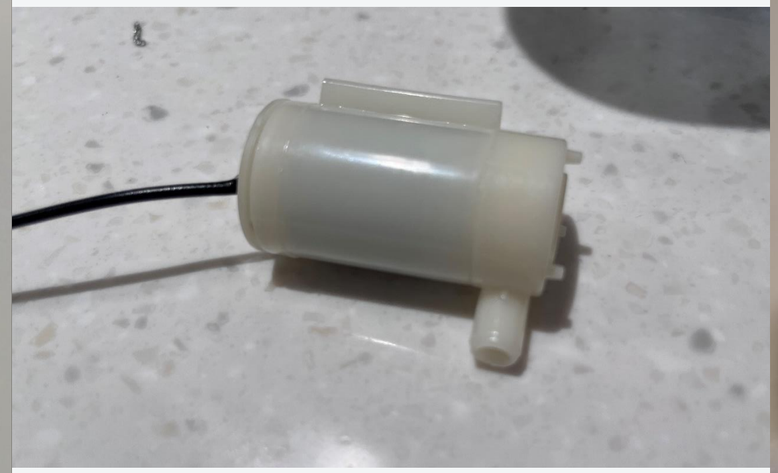
OBJECTIVES OF EXPERIMENT 2

- To observe the temperature change of a glass of hot water after using water cooling system under different voltage in one minute

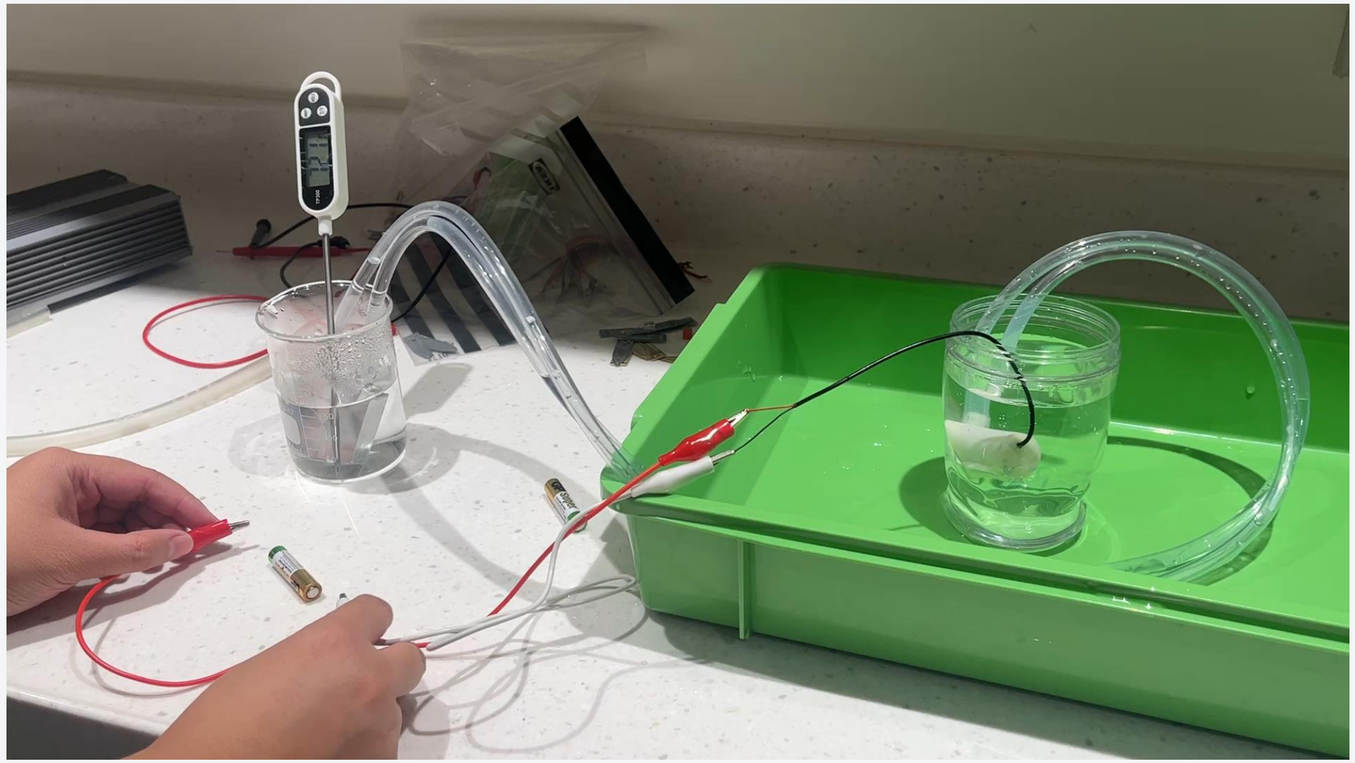
EXPERIMENT MATERIAL

- 水冷頭
- 水管
- 水管卡扣
- 馬達
- 電池



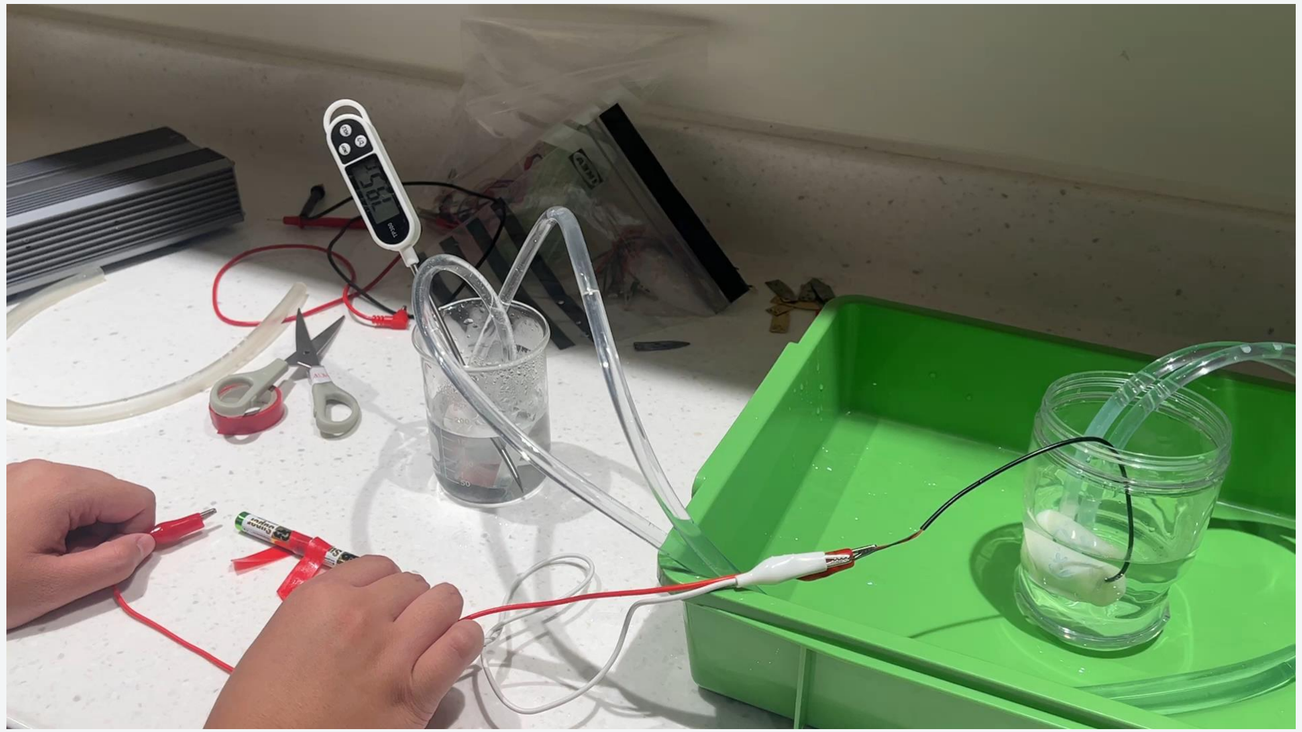


Experiment2



Using 1.5V:
Fail to pump water

Experiment2



Using 3V	Before (˚c)	After (˚c)	change	%
1st	79.3	62.1	-17.2	-21.7
2nd	75.3	53.3	-22	-29.2
3rd	81.9	52.1	-29.8	-36.3
average	78.8	55.8	-23	-29.1

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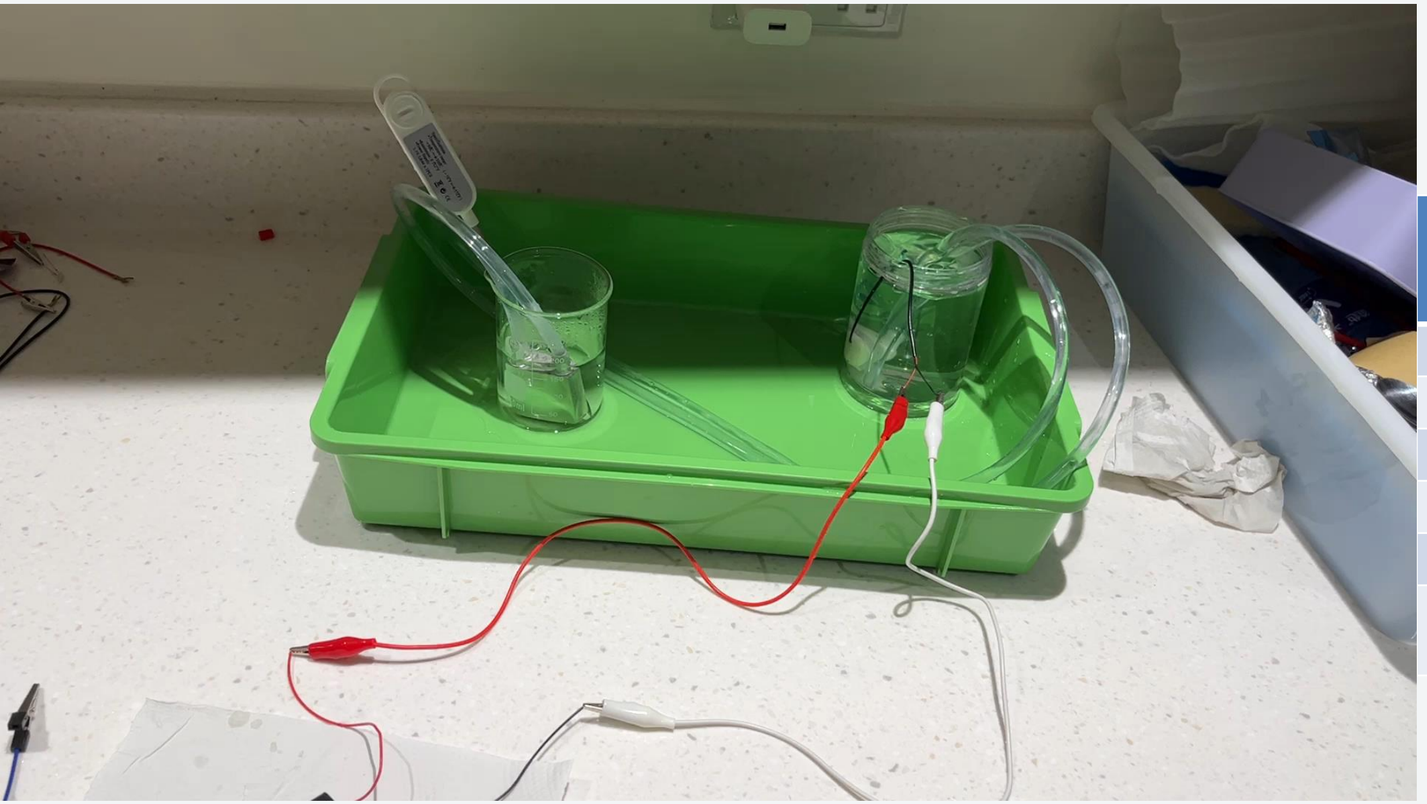
Experiment2



Using 4.5V	Before (˚c)	After (˚c)	Change	%
1st	66.9	56.8	-10.1	-17.7
2nd	79.5	53.5	-26	-32.7
3rd	81.9	60.3	-21	-25.6
4th	82.5	50.6	-31.9	-38.7
average	77.7	55.3	-22.4	-28.8
average	81.3	54.8	-26.5	-32.6

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