e-Life@KYC

Kau Yan College

S.2 Science

Unit 7: Drip Irrigation Device

Class: S.2 ___ Name: _____ ( ) Date: _____

Drip irrigation device for water conservation

Objective: To design and make a drip irrigation device for water conservation by using disposable materials

Apparatus:

Cutter	x 1	Scissors	x 1 pair
Glue gun	x 1	Adhesive tape	
Heat-proof mat	x 1	Rubber tubbing	

Materials (collected):

Possible engineering problems:

1. To fix a rubber tubing into the bottom of a plastic bottle.
2. _____
3. _____

Safety precautions:

1. Do not touch the melted glue and the hot part of the glue gun.
2. _____

Design:

Working principle:

Scientific investigation on water dripping with water bottle

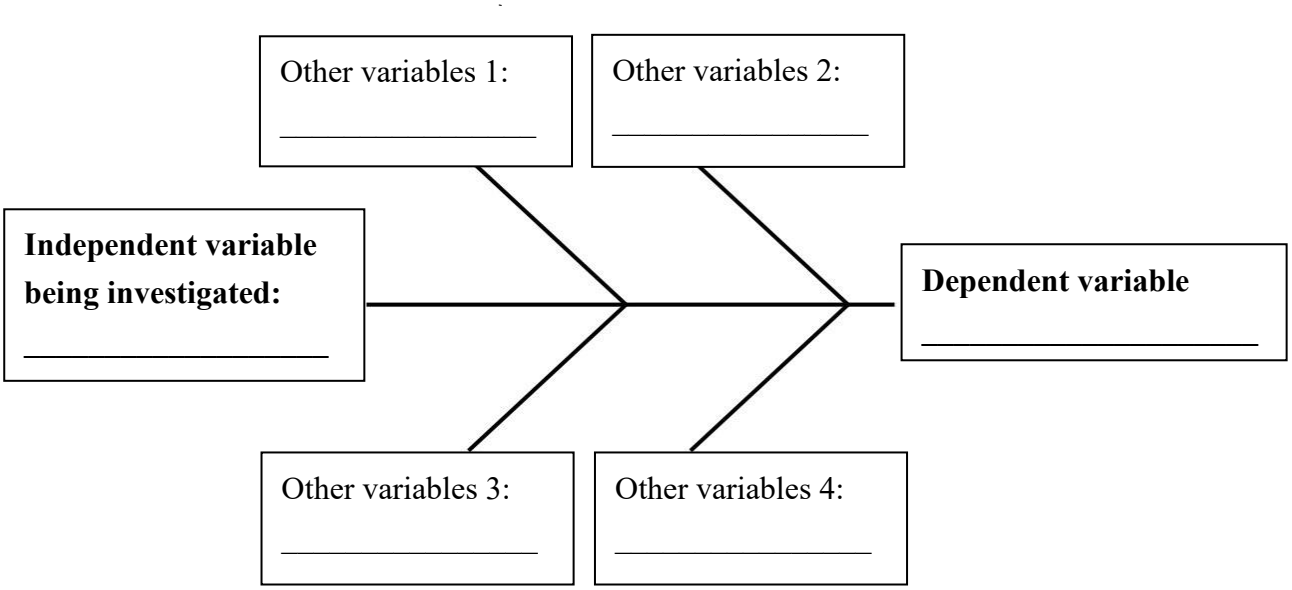
Objective: To investigate different factors (e.g. the diameter of the rubber tubing, the height of the water bottle, the number of holes in the rubber tubing etc.) that affect the amount of water dripped from the irrigation device.

Apparatus and materials (for each group):

Stand and clamp	x 1	250 mL beaker	x 1
Irrigation device	x 1	Stopwatch	x 1
Clip	x 1	Measuring cylinder	x 1
Pin	few		

Setting up variables:

Fill in the fish bone diagram below about the variables of your investigation. Identify the variables by studying the objective.



Other variables are the **controlled variables** in your scientific investigation.

Precautions:

1. The end of the rubber tubing should be sealed.
2. Be caution when drilling holes in the rubber tubing when using the pin.

Procedures:

1. Setup your investigation with the materials and apparatus provided.
2. Use Surface tablets to take photos on (a) your setup and (b) how you make your measurement and share them in the Powerlesson2 platform.

Data recording:

Construct a table to record the results and share it to the Powerlesson2 platform.

Discussion:

1. Explain why the top of the drip irrigation device should not be covered?

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2. Estimate the volume of water collected from the drip irrigation device for 24 hours. Show your estimation with calculation.

Conclusion:

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Competition

Objective: To water a pot of flowering plant for 7 days by using your drip irrigation device. The group that can make sure the plant can survive and grow without filling extra water into the drip irrigation device will be the winner!

Procedures:

1. Fix the drip irrigation device into the pot of plant.
2. Put the pot of plant into the space provided at the school atrium.

3. Observe and record the results into the below table provided. You may also take a photo of the pot of plant and upload it into the PowerLesson2 platform.

Results:

Day	**Condition of the flowering plant**
1	
2	
3	
4	
5	
6	
7	

Discussion:

1. Suggest one advantage of using the drip irrigation device to water the plant.

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2. (a) Can the drip irrigation device provide enough water to water the plant for 7 days? If not, how many days can it provide the plant with enough water?

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(b) Suggest how you may improve the efficacy of the drip irrigation device.

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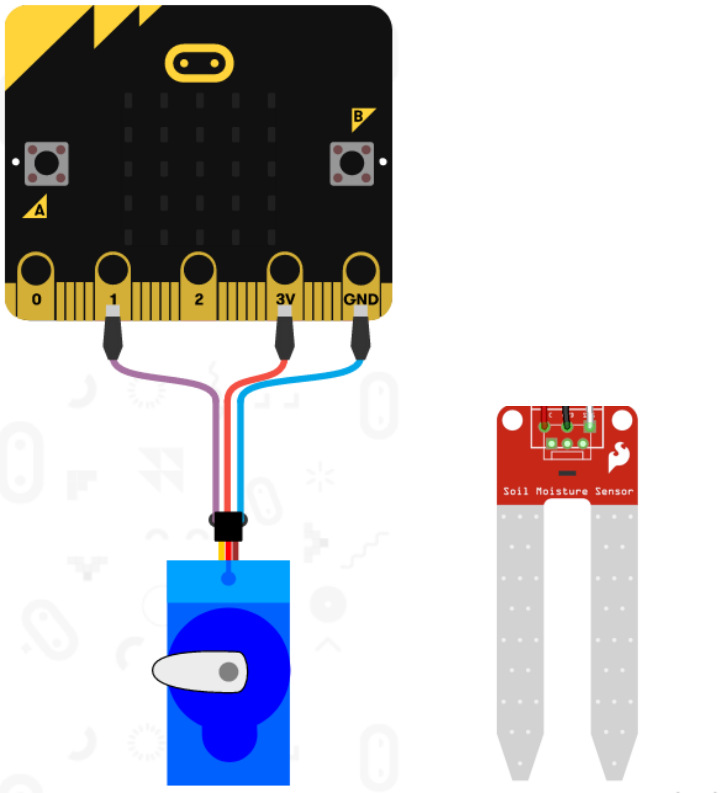
Further improvement of the drip irrigation device with technology



Background:

You have learnt how to use Micro:bit, sensors and motors, as well as write up program in Microsoft MakeCode in S.1 Computer Literacy (please refer to the S.1 Micro:bit Worksheet). Try to further improve your device with the use of these equipment so that **more water can be conserved in a smart way**.

Apparatus and materials:

Micro:bit	x 1	servo motor	x 1
Soil moisture sensor	x 1	clip	x 1
Others			

Follow-up:

1. Take a photo of your revised drip irrigation device and upload it into the Powerlesson2 platform.
2. Evaluate the performance of the device and share your findings in the Powerlesson2 platform.