

Promoting the Use of Educational Technology in Learning and Teaching in Science (S1-3) Learning and Teaching Resources

Photosynthesis



Student Worksheet
Integrated Science (S2)
Photosynthesis

| | | | | | |
|---------------|--|----------------|-----|---------------|--|
| Name : | | Class : | () | Date : | |
|---------------|--|----------------|-----|---------------|--|

Question - asking testable science question / hypothesis

1 The following listed 4 statements about investigating the growth of plant. Which of them are testable by experiment?

- What is the best temperature for the plant to growth?
- Is the presence of carbon dioxide essential for plant to growth?
- What are the conditions required for the plant to grow healthier?
- Is water important for plant to growth?
- What makes plant grow well?

2 What variables would you change and measure to test about the hypothesis below?

A suitable soil pH is essential for plant to grow faster

| Variable to change | Variable to measure or observe |
|--------------------|--------------------------------|
| | |

<<Hypothesis 2>>

| Variable to change | Variable to measure or observe |
|--------------------|--------------------------------|
| | |

Question – Fair testing / inductive inference and control setup

- 3 The follow is a plan for an investigation to find out how the volume of water given to the seeds each day affected the number of seeds germinated in a week.

| | Variable to measure | Other variables | | | |
|-----------------|-----------------------------|--|----------------------|-----------------------|--------------------------|
| Experiment sets | Number of seeds germinating | Volume of water added per day (cm ³) | Number of seeds used | Location of the setup | Surface for seed growing |
| A | ? | 0 | 10 | Outdoor under sun | Blotting paper |
| B | ? | 5 | 10 | In a room under light | Soil |
| C | ? | 10 | 12 | In a room under light | Soil |
| D | ? | 13 | 10 | In a room under light | Soil |

Identify three mistakes in the plan and propose how you would change the plan for a fair investigation.

Question – Drawing “valid” conclusion.....?

Task 1:

Our group investigate if _____ is an essential factor for photosynthesis.

1. Fill in the table to identify variables.

| Independent variable | Dependent variable | Control variable (if any) |
|----------------------|--------------------|---------------------------|
| | | |

2. Do you need a control set-up? Why?

3. How do we ensure that the starch is formed during the experiment but not before the experiment?

4. (a) Take a picture of your result and upload it on <any e-learning platform>.

(b) Is the assigned factor essential for photosynthesis? How do you know from the results?

Task 2:

1. Construct a diagram to show the raw materials needed for the production of glucose in the *DragGame* activity.

<https://draggame.e-learning.hk/zh-hant/templates/281/view/>

2. Share your *DragGame* diagram with your peers.

Comparing the following diagrams with the one constructed by your group, which one does your group think best represents what happens at the particle level for explaining how the raw materials are chemically changed to glucose.

Diagram 1

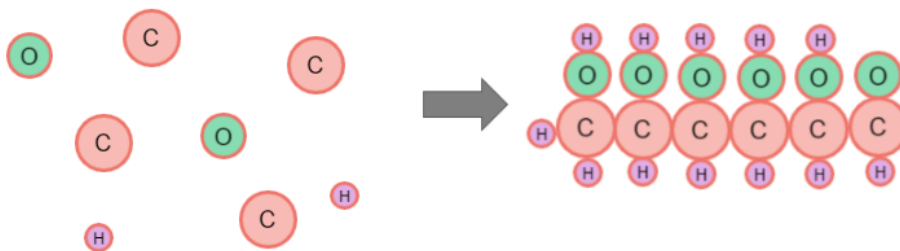


Diagram 2

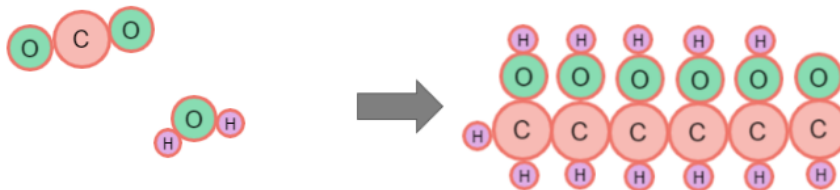
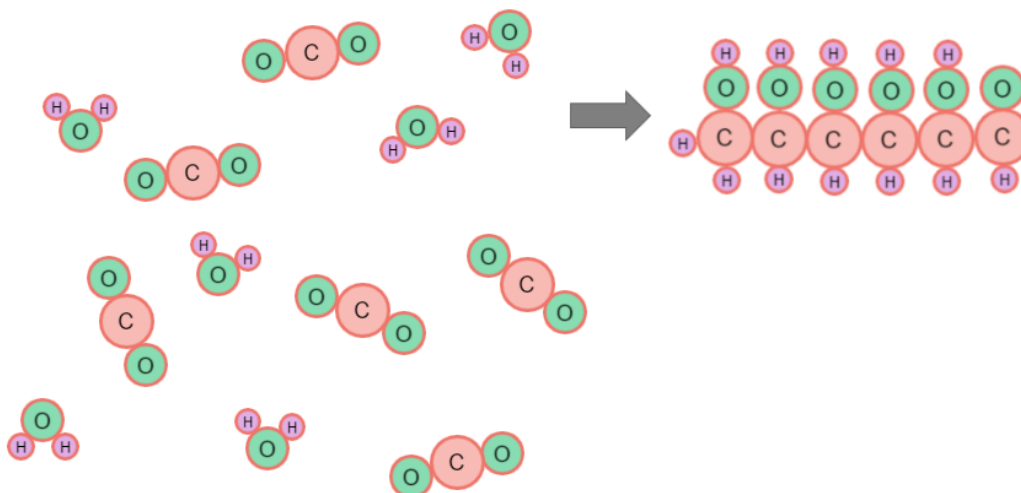


Diagram 3



Consider the following questions:

- How do we represent raw materials? Why?
- Should the number of particles change before and after the reaction? Why?
- Is there anything else can be predicted from the diagram?

(a) We think that diagram _____ best represents the chemical change at particle level
because

- Before a chemical change, all particles are dispersed.
- All types of particles required for a chemical change exist before the change.
- If there are any other options,

Appendix 2: Assignment Task Sheet

1. Draw a labelled set-up to collect the gas produced by the plant in photosynthesis

Guiding questions:

- a. What plant or part of the plant would you choose? Why?
- b. What apparatus do you need?
- c. How do you know if you are collecting the gas as it is colourless?

