

# DISCLOSED !!!

## WEEKLY PRIZED SCIENCE HUB CHALLENGE (Part 4) ANSWERS

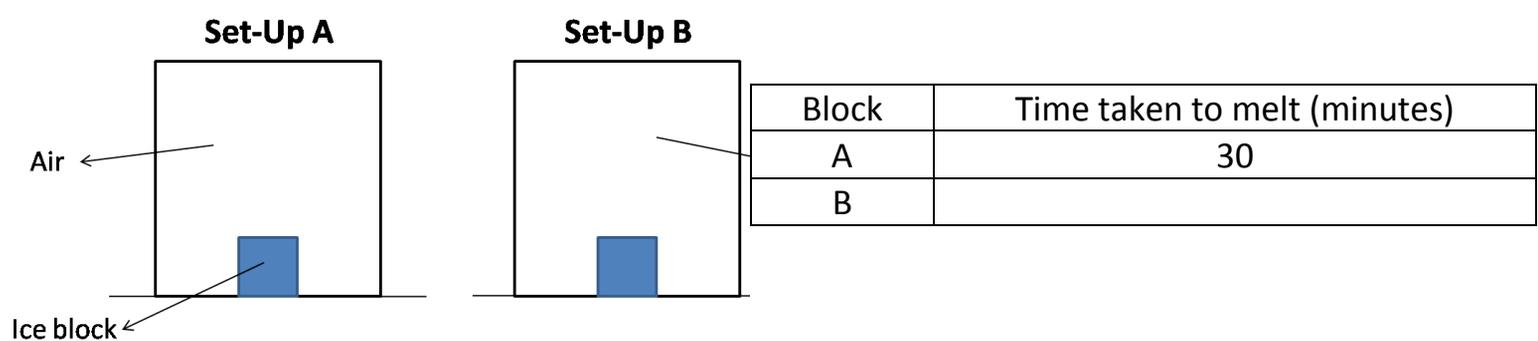
The world is currently facing crucial global warming. One of the causes is an excessive amount of “greenhouse effect”. The greenhouse effect is a process where heat from the Sun is absorbed by “greenhouse gases” in the atmosphere. It is useful to trap heat and keep the earth warm. However, if there is an excessive amount of greenhouse gases, they will cause the temperature of the Earth to increase even further, affecting the livelihood of living organisms.

(a) Give 3 examples of greenhouse gases.

**ANSWER** (any 3 of the following gases)

- Carbon dioxide
- Methane
- Nitrous Oxide
- Water vapour

Mr. Ang set up an experiment to investigate the greenhouse effect. He used two identical jars containing identical ice blocks but filled with different gases. After placing the two jars in the sun, he recorded the time taken for both ice blocks to melt.



(b) (i) Predict the time taken for block B to melt. Fill in the blank in the table.

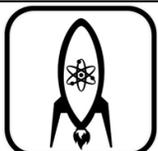
**ANSWER**

**10-29 minutes** (any sensible answers <30)

(ii) Explain your answer.

**ANSWER**

Carbon dioxide in Set-Up B is a **greenhouse gas**, which **traps more heat compared to air** in Set-Up A, which only has a **small fraction of carbon dioxide**. As a result, the ice block in Set-up B **gains heat from the surrounding and melts at a faster rate** than the one in Set-Up A.



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GOOGLE TIME !!!

### Common Mistakes

1. Greenhouse gases **contain** heat.

#### **Explanation :**

*Based on the principles of heat transfer, a matter has to **absorb** heat before having internal energy. **Instead of 'contain', the word 'absorb' is more appropriate** for primary school level.*

2. Greenhouse gases **create** heat.

#### **Explanation :**

*Heat is a form of energy. **It cannot be created nor destroyed.***

3. **The ice block in Set-Up B melts faster than the one in Set-Up A.**

#### **Explanation :**

*The ice block in Set-up B should **gain heat first before melting**. Hence, it would be better to state "The ice block in Set-Up B **gains heat and melts faster** than the one in Set-Up A".*

- (c) (i) Find out which planet is the hottest in our solar system.

#### ANSWER

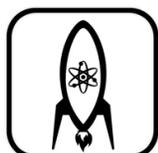
**Venus**

- (ii) Explain why.

*(Hint : do you think that the hottest planet will have the greatest amount of greenhouse gases?)*

#### ANSWER

***Although Venus is not the closest planet to the sun like Mercury, its thick atmosphere consists of 96% carbon dioxide, which is a greenhouse gas that is able to trap heat radiated away from the planet. It results in extremely high temperature on Venus. (Differently from Venus, Mercury has a very thin atmosphere.)***



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