1 Academy

Name: _____ Date:

Innovative Intensive Training – 2017

1. Many pupils think that during photosynthesis, plants stop to respire. Do you think is correct?

   State a reason to support your answer. (2m)

   _____

   _____

   (Research for potential scientist: http://en.wikipedia.org/wiki/Photosynthesis)

2. In a gigantic aquarium, there are many submerged aquatic plants which are able to photosynthesis in the day with sunlight and in the night with artficial lighting. A dolphin, named Nebo, is being kept in this aquarium. However, it was observed that Nebo surfaced regularly to breathe. Explain why Nebo needs to surface to breathe even though the aquatic plants produced sufficient oxygen for it to respire. (3m)

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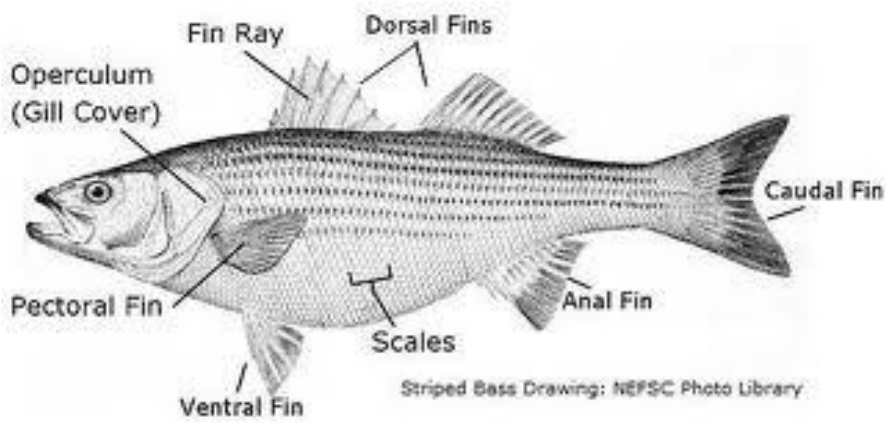
Fun Science : Draw and label two aquatic plants (one fully submerged and one partially-submerged) here:

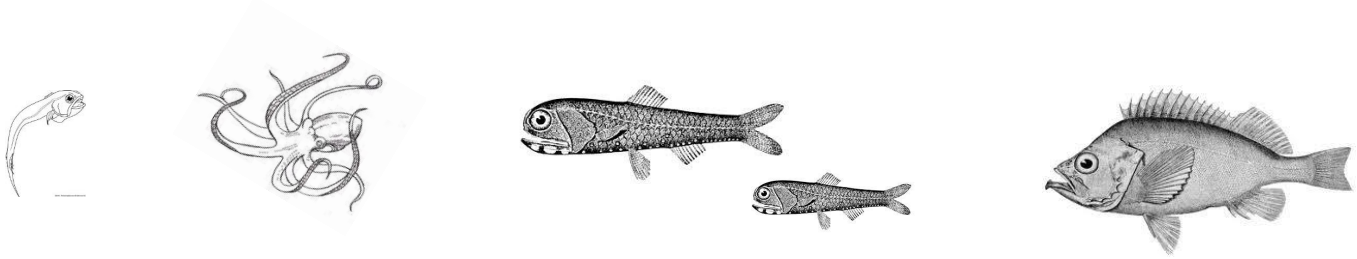
3. Study the picture of a fish here:



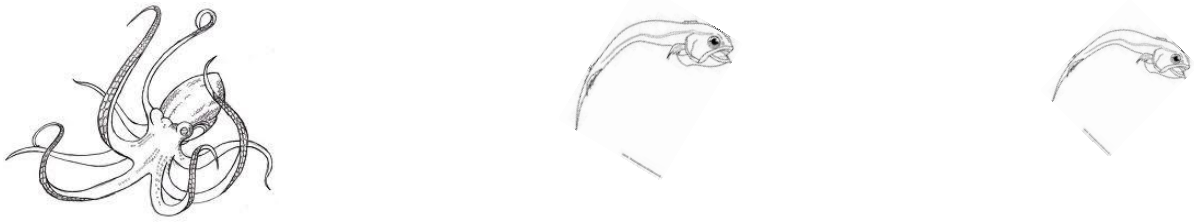
(a) On the picture above, **draw arrows to show the flow of water entering** and **leaving** the fish. (1m)

(b) State the function of the gills. (1m)

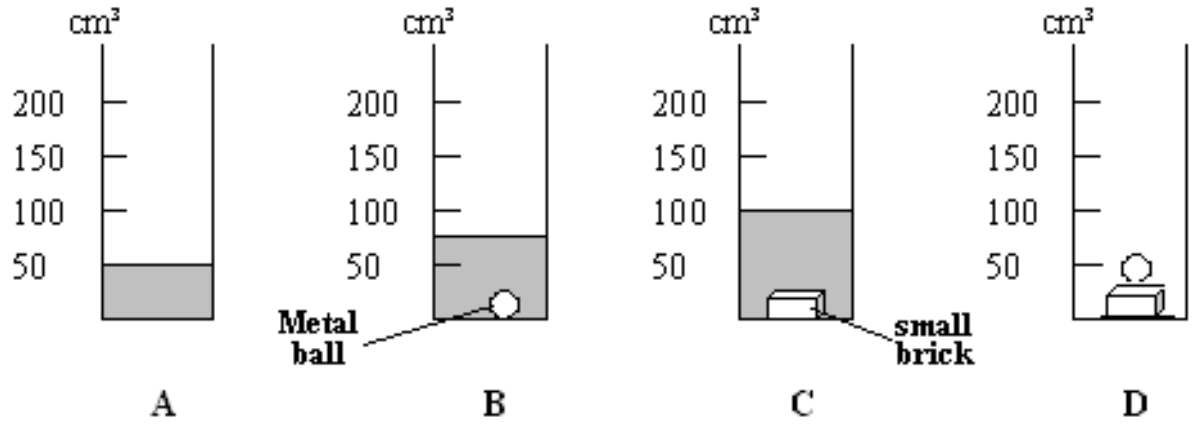
_____



(c) In the ocean, usually under **more than 150m deep, is total darkness**. Therefore, very little amount of aquatic plants can survive in depths more than 150m. Suggest the amount of dissolved oxygen in the ocean varies with the depth? (1m). *Interestingly, deep sea creatures are able to survive in depth of more than 2000m.*



4. Miss Tan fills a measuring cylinder with some water. She then puts an iron ball and a small brick into the measuring cylinder one at a time. Diagram B and C show the new water levels when the iron ball and the small brick are put into the measuring cylinder.



(a) What is the volume of small brick? (1 mark)

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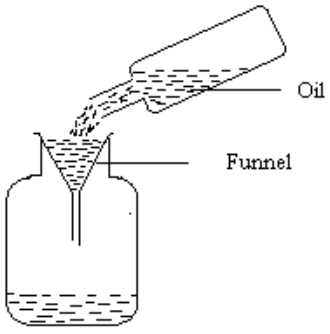
(b) What will be the level of water when the iron ball and the small brick are put together into the cylinder? Indicate your answer in the diagram D. (1 mark)

5. Lily was transferring some oil from a small bottle to a big bottle using a funnel. After sometime she noticed that the oil stopped flowing though the bottle still had a lot of space in it.



(a) Suggest what Lily should do to let the oil flow into the bottle. (1 mark)

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(b) Explain why your suggestion in (a) would work? (2 marks)

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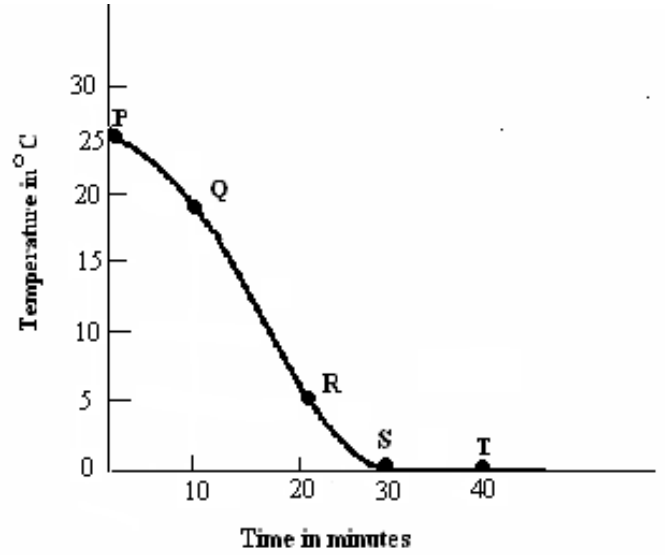
6. A beaker of tap water was put in the freezer compartment of a refrigerator. The temperature of water was read at regular intervals of 10 minutes. The graph below shows the changes in temperature.



(a) What was the temperature of the tap water at the beginning? (1 mark)

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(b) Which part of the graph shows change in the state of water? (1 mark)

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(c) How long does it take for the temperature of the water to decrease from 25 deg C to 15 deg C? (1 mark)

_____

7. **Error analysis**: In each of the following statements, the scientific concepts are not being clearly conveyed. Correct each statement, so that the scientific concepts are being explained clearly.

(a) The iron rod will become **cooler**.
E.g. The **temperature** of the iron rod will **decrease.**

(b) Beaker A is **warmer** than Beaker B.
E.g. The **temperature** of

(c) Water makes the road **more slippery**. (Hint: Friction)

(d) No light could pass through material Q because it is **very thick**. (Hint: Opaque)

(e) Most light could pass through material R because it is **thin.**

(f) Heating and hammering the magnet will make the magnet **to be weak**.

(g) By increasing the number of batteries **in a row** will make the electro-magnet **stronger**.

(h) By putting the batteries **side by side** will not make the electro-magnet **stronger.**

(i) Cement surfaces are **rougher** than marble surfaces, therefore we need to be **more careful while walking** on marble surfaces.

(j) **Colder air** from the air-con would **fall down**, while **hotter** air from the surrounding would **fly up**.

(k) The frog has **three life cycles**.

(l) We could see material P well because it is **very shiny**.

(m) 800 ml of water at 60 deg C contains the same amount of heat than 350ml of water at the same temperature. (improve on the statement).

(n) The hot water in the metal cup will cool down faster than the same amount of hot water in a plastic cup because metal is good conductor of heat. (improve on the statement).