Part I : Each multiple choice Question (A, B, C, D, E) is worth 2 points.

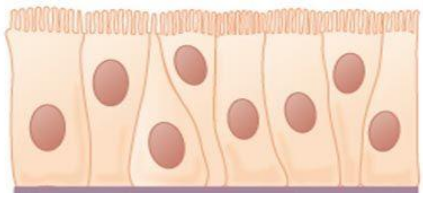
1. The following picture shows anchovies.



Which of the following has the closest relation to anchovy?

A. starfish
B. jellyfish
C. eel
D. axolotl
E. shark

2. The following animal tissue consists of a layer of ciliated cells with different nuclei positions. The hair-like projections (cilia) propel pathogens and inhaled particles trapped in the mucus.



The above tissue is located .....

A. along the respiratory tract
B. along the blood vessels
C. at the surface of the stomach
D. in the skin
E. in the kidney tubule

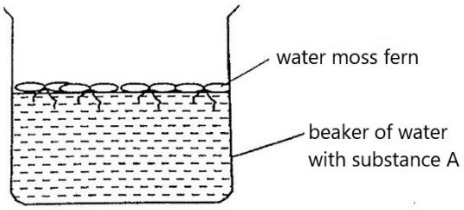
3. A solar cell is black or dark colored at the top side that faces the Sun so it could .....

A. absorb more heat from the Sun.
B. not dazzle the eyes.
C. absorb all the colored light.
D. reflect more light.
E. absorb the heat and reflect the light from the Sun.

4. Susi and Neno join the 12 kilometer running competition. All runners start at the same time. Susi needs 50 minutes and Neno needs 1 hour to reach the finish line. Assume Susi and Neno run at a constant speed. How many meters is Susi ahead of Neno, 15 minutes after they start?

A. 600 meters
B. 1000 meters
C. 1500 meters
D. 2500 meters
E. 5000 meters

5. Adi wants to examine the effect of substance A on an aquatic plant. He places some water moss fern in a beaker of water containing substance A as shown below.

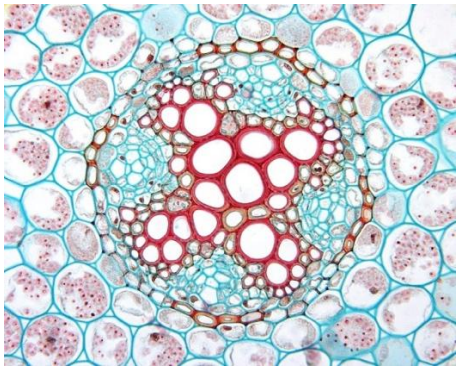


What should Adi do to make the experiment a fair test if he wants to test the effect of substance A on water moss fern?

1) Pour a layer of oil into the water at the start of the experiment.
2) Set up a control beaker containing water and water moss fern only at the start.
3) Measure the mass of water moss fern before and after the experiment.
4) Count the number of water moss ferns that are alive after the experiment.
5) Set up a control beaker containing a different volume of water

A. 1, 2, 3, 4, 5
B. 1, 3, and 5 only
C. 2, 3, and 4 only
D. 2, 4, and 5 only
E. 2 and 4 only

6. The following picture shows a structure of root stele.



Which of the following has a similar stele structure to the one shown in the picture?

1) Cactus
2) Bamboo
3) Grapes
4) Apple
5) Turmeric

A. 1, 2, 3
B. 1, 3, 4
C. 2, 4, 5
D. 3, 4, 5
E. 2, 3, 5

7. A student investigates the sugar content of four different fruit juices. This is the student's method.

1) Add 5 cm^3 of fruit juice to a boiling tube.
2) Add 5 cm^3 of Benedict solution to the boiling tube.
3) Place the boiling tube in a water bath at 70 °C for three minutes.
4) Remove the boiling tube and record the color of the solution.

The student uses this method for each of the four fruit juices.

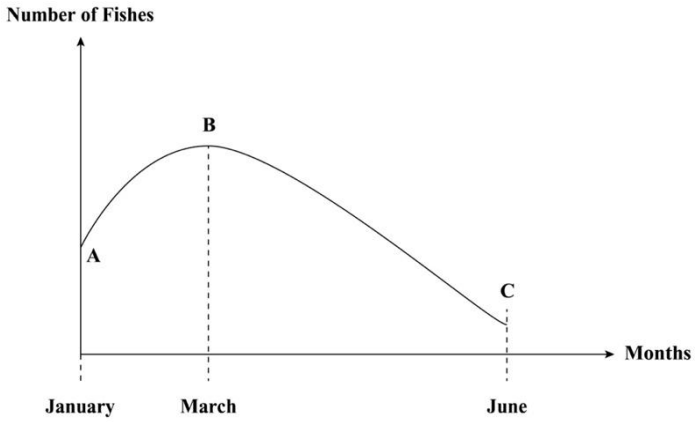
The table shows the student's results.

Fruit juice	Color of solution after heating for three minutes
A	blue
B	brick red
C	yellow
D	green

Which of the following shows the order of the juices from the lowest to the highest sugar concentration?

A. A-B-C-D
B. A-D-C-B
C. B-C-D-A
D. B-D-C-A
E. A-C-D-B

8. The graph below shows how the number of fishes in a pond changed over a period of 6 months. The fishes in the pond feed on the water plants.



What are the likely reasons for the change in the number of fishes in the pond?

A. From A to B, the birth rate of fishes was equal to its death rate.

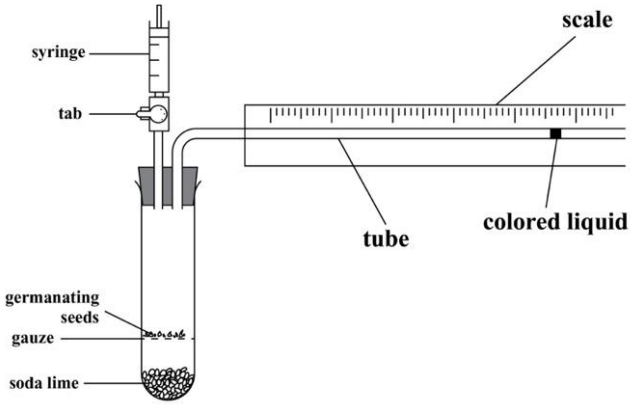
B. From A to B, the number of animals feeding on the fishes increased.

C. From A to B, the dissolved oxygen in the pond decreased.

D. From B to C, water plants were added to the pond.

E. From B to C, food competitors were added to the pond.

9. A student investigates the oxygen absorbed by germinating seeds at different temperatures. The diagram shows some of the student's apparatus.



What is the function of soda lime?

A. It absorbs carbon dioxide.

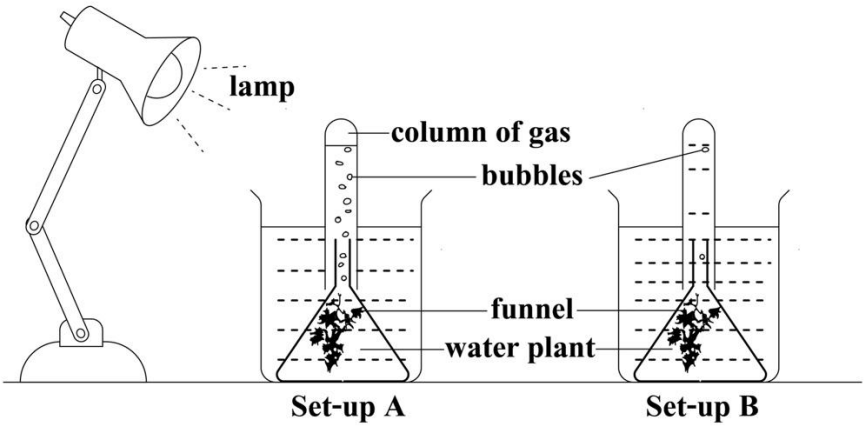
B. It absorbs oxygen.

C. It releases carbon dioxide.

D. It releases oxygen.

E. It absorbs water vapor.

10. Wati wanted to investigate whether light intensity would affect the rate at which plants photosynthesize. She placed an equal mass of water under an inverted funnel in two set-ups, A and B. She added a lamp for set-up A. After that, she left them for 2 hours. The following diagram shows set-up A and B.



Which of the following should she measure in order to conclude the experiment?

1) The temperature of water in the beaker
2) The distance between the lamp and the set-up
3) The height of the column of gas at the top of the test tube
4) The size of the water plant

A. 1 and 2 only
B. 1 and 3 only
C. 2 and 3 only
D. 3 and 4 only
E. 1 and 4 only

11. A razor blade can float on the water surface if it is put slowly. Which statement is correct based on the phenomena?

A. Buoyance force on the razor blade is equal to its weight.

B. The weight of the razor blade is very small so it can be neglected.

C. The surface tension force is equal to the razor blade weight.

D. The buoyance force on the razor blade is greater than its weight.

E. The density of razor blade is less than water density.

12. Alfa does the experiment with a sample object. He observes the state of the object by changing the temperature.

Here is the observation table:

Temperature (°C)	State
0	Solid
20	Solid
40	Liquid
60	Liquid
80	Liquid

Which statement is correct about the experiment :

A. Its freezing point is 20°C.

B. Its boiling point is 120°C.

C. At room temperature, it is in a liquid state.

D. If the object is cooled until -20°C, it is in a solid state.

E. If the object is heated until 100°C, it is in a gas state.

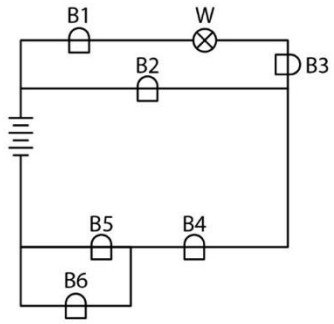
13. Study the table below which shows information on two processes, X and Y

Description	Process X	Process Y
Energy	Released	Stored
Oxygen	Used up	Given out
Carbon dioxide	Given out	Used up

Which of the following shows when processes X and Y take place?

	Process X	Process Y
A.	All the time	During the day
B.	During the day	All the time
C.	During the day	During the night
D.	All the time	All the time
E.	During the night	All the time

14. Study the circuit below.



Which of the following buzzers will continue to sound when bulb W fuses?

A. B1, B2 and B3 only

B. B2, B3 and B6 only

C. B1, B2, B4 and B5 only

D. B2, B4, B5 and B6 only

E. B1, B3, B4 and B5 only

15. There are three parent plants as shown on the map. The table below describes their respective fruits.

	Light	Fleshy	Waxy	Hairy
▲	✗	✓	✗	✗
●	✓	✗	✓	✗
■	✓	✗	✗	✓

Which of the following correctly represents the dispersal methods of the three plants?

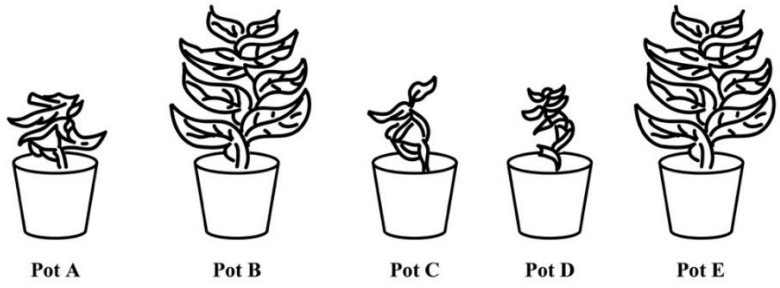
	▲	●	■
A.	Animals	Water	Wind
B.	Splitting	Wind	Animals
C.	Water	Wind	Animals
D.	Wind	Water	Splitting
E.	Animals	Wind	Water

Part II : Each short answer is worth 3 points.

16. Ani plants five identical plants in five different pots which contain the same amount of soil. She wants to find out factors affecting plant growth. Different treatments shown in the following table are represented by ticks (✓).

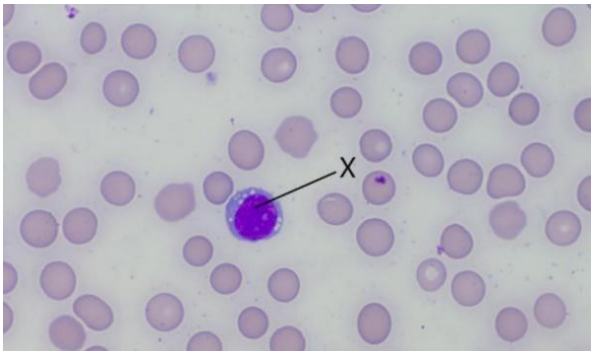
Treatments	Pot A	Pot B	Pot C	Pot D	Pot E
Presence of water	✓	✓	✓	-	✓
Presence of sand	✓	-	✓	✓	✓
Presence of light	✓	✓	-	✓	✓
Presence of minerals	-	✓	✓	✓	✓

The diagrams below show Ani's plants after ten days.



Based on the above results, which factor has the least effect on plant growth?

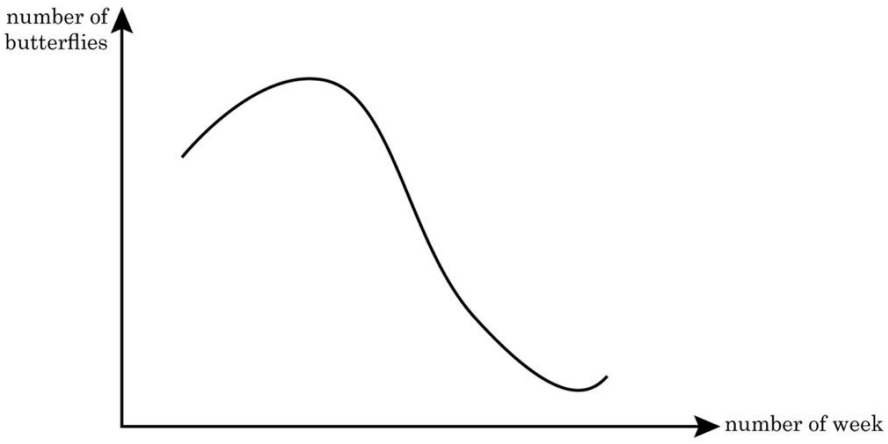
17. The blood element marked by the letter X in the following picture is called .....



18. A 10 kg object is pulled by two forces F_1 and F_2 on the frictionless floor. The magnitude of F_1 is 50 N and of F_2 is 30 N. The maximum acceleration of the object is .....(18.1)..... m/s^2 and the minimum acceleration of the object is .....(18.2)..... m/s^2.

19. In the evening, the Sun and the sky look reddish. It happens because the .....(19.1)..... color light is more scattered by the air particles during the propagation, and the .....(19.2)..... color light can reach the eyes.

20. The graph below shows the changes in the population size of butterflies in a field.



Which of the following could be the reasons that cause the change in the number of butterflies in a field?

1 : There is an increase in the number of organisms that compete with the butterflies for the same type of food.

2 : There is a decrease in organisms that feed on the butterflies.

3 : The plants were infested with a disease.

4 : There were more births than deaths.

Which statement is correct?

21. River X runs through four different towns. It is heavily polluted. The Environmental Health Department has sent their officers to investigate the source of the pollution. The officers tabulated their findings in the table shown below.

	Town A	Town B	Town C	Town D
Murky Waters	✗	✓	✓	✗
Musty Smell	✗	✓	✗	✗
High Level of Oxygen	✓	✗	✓	✓
Plenty of Organisms	✓	✗	✗	✗

Based on the report, which town is most likely to be polluting the water in the river?

22. During a Science lesson, Miss Su brought Plant X, which has red leaves, to show the class.



She then asked her pupils to discuss whether the plant would be able to carry out photosynthesis. Her pupils' responses were as shown below.

Mabel : Plant X cannot photosynthesis because it does not have green leaves.

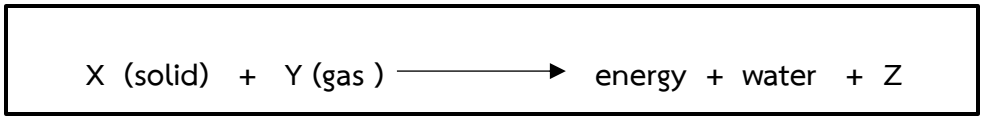
Yvonne : The red leaves have red pigment which can absorb light for photosynthesis.

Wendy : There is chlorophyll hidden under the red pigment which can absorb light for photosynthesis.

Karen : The red pigment blocks out the light and prevents photosynthesis from taking place.

Which of Miss Su's pupils is correct?

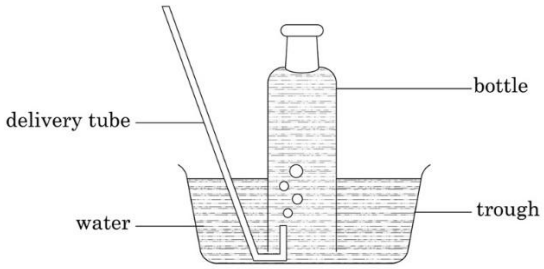
23. Daniel wrote the following equation for a process which produces energy in living things.



Which of the following could X, Y and Z be?

24. Fuse is one of the safety instruments in the electric circuit. How the fuse can protect the circuit?

25. Shane and Carol each took a deep breath and blew into the delivery tube in the set-up shown below.



The results of the experiment are as follows :

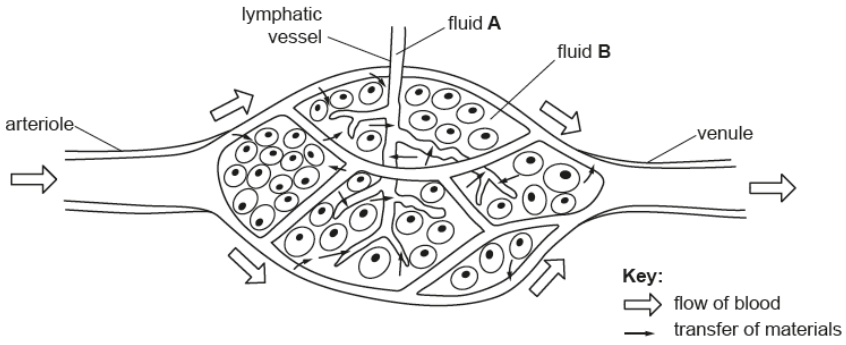
Name	Height of water in the bottle at the beginning of the experiment (cm)	Height of water in the bottle at the end of the experiment (cm)
Shane	8	3.8
Carol	8	4.5

25.1 Why is there a decrease in the height of water in the bottle when Shane and Carol blew into the delivery tube?

25.2 From the result, who has a larger lung capacity to take in oxygen?

Part III: Essay (Total 40 points.)

26. The diagram below shows the transfer of materials between blood and tissues. (7 points)



26.1 Complete the following table by:

- stating the names of the fluids (1 points)
- writing "yes" if the fluid contains red blood cells and "no" if it does not contain red blood cells. (1 points)

Fluid	Name of the fluid	Contain red blood cells

26.2 Explain why cells need oxygen?. (3 points)

26.3 Describe the function of arterioles in the skin. (2 points)

27. The following table shows stunting prevalence in Indonesia. (10 points)

Year	Stunting Prevalence (%)
2007	36,8
2010	35,6
2013	37,2
2018	30,8
2019	27,7

27.1 Explain the main symptom if a child has stunting. (4 points)

27.2 Describe the causes of stunting. (2 points)

27.3 According to the WHO standard, an area has a chronic level of stunting if the prevalence is above 20%. Our government has launched two programs that aim to get stunting under 20% in 2024. Health providers are trained in the prevention of stunting. They provide advice for the community around them on how to prevent stunting. Suggest the advice that should be given to the community. (4 points)

28. Block A is dipped into the water (water density is 1000 kg/m^3), and block A is floating with 20 % of its height not immersed in water. (8 points)

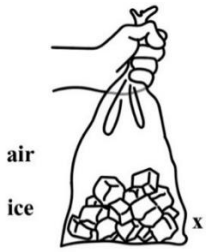
28.1 What is the density of block A? (2 points)

28.2 If the size of block A is (20 cm x 20 cm x 20 cm), what is the mass of block A? (2 points)

28.3 If block A is dipped into another liquid, of which that the density is 1200 kg/m^3, what is the height of block A that is not immersed in the liquid? (4 points)

29. Answer these questions :

29.1 The picture below show ice in a plastic bag being carried by a nurse from a freezer to the operating theatre in a hospital. (6 points)



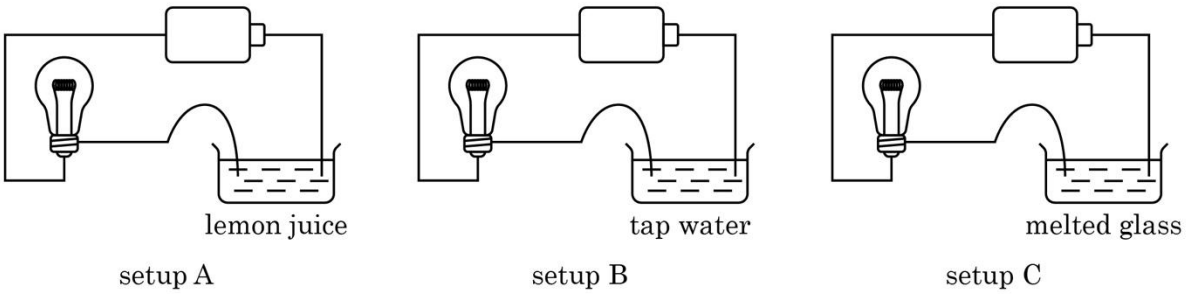
(i) Explain how the convection current is formed. (2 points)

(ii) The nurse notices that the ice melts too quickly. She puts the plastic bag containing the ice into a second plastic bag. There is a layer of air between the two bags. Explain how this layer of air helps to stop the ice melting. (2 points)

(iii) The bag contains ice at 0 °c.
Thermal energy (heat) passes into the bag at a rate of 24 J/s.
The specific latent heat of fusion of water is 336000 J
Calculate the time taken to melt 100g of ice in the bag. (2 points)

29.2 Putri pours equal amount of hot water into two cups of the same shape and size. Cup A is made from aluminium and cup B is made from clay. In which cup will the water get cold faster? Explain your answer. (3 points)

30. Alice prepares three set-ups shown below. (6 points)



setup A setup B setup C

30.1 What happens when the ends of the wires are immersed in the lemon juice as shown in Set-up A? Explain your answer. (2 points)

30.2 What happens when the ends of the wires are immersed in melted glass as shown in Set-up C ? Explain your answer. (2 points)

30.3 What is Alice trying to find out based on the three set-ups? Explain your answer. (2 points)

National Selection : ASMOPSS Thailand 2022 (2nd Round – Science Primary)

Answer Keys :

Part I : Each multiple choice Question (A, B, C, D, E) is worth 2 points.

No.	Answers	No.	Answers	No.	Answers
1.	C	6.	B	11.	C
2.	A	7.	B	12.	D
3.	C	8.	E	13.	A
4.	A	9.	A	14.	D
5.	C	10.	C	15.	A

Part II : Each short answer is worth 3 points. (Total 30 points.)

No.	Answers
16.	Sand
17.	lymphocyte = 3 points / white blood cell = 1.5 points
18.	18.1 = 8 or 8 m/s^2 ; *(2 points)* 18.2 = 2 or 2 m/s^2 *(2 points)*
19.	19.1 blue; *(2 points)* 19.2 red (2 points)
20.	1 and 3
21.	Town B
22.	Wendy
23.	X = sugar Y = Oxygen Z = carbon dioxide
24.	Fuse can break the circuit when the current is too high.
25.	25.1 The air that they blew out occupied the space in the bottle. 25.2 Shane has a larger lung capacity.

Part III : Essay (Total 40 points.)

<table>
<tr><th>No.</th><th>Answers</th></tr>
<tr><td>26.</td><td>26.1

<table>
<tr><th>Fluid</th><th>Name of the fluid</th><th>Contain red blood cells</th></tr>
<tr><td>A</td><td>Lymph</td><td>no</td></tr>
<tr><td>B</td><td>Interstitial fluid</td><td>no</td></tr>
</table>
</td></tr>
<tr><td></td><td>26.2 cells need oxygen for (aerobic) respiration or the release of energy or metabolic processes</td></tr>
<tr><td></td><td>26.3 Arterioles deliver/supply blood/oxygen/glucose/nutrients (from arteries) to capillaries; They control blood flow through capillaries (to the surface of the skin) by (vasoconstriction / vasodilatation) or by arteriole (muscle) contraction/relaxation; They help our body to maintain temperature or homeostasis</td></tr>
<tr><td>27.</td><td>27.1 Stunting is when a child fails to grow to the proper height for his/her age</td></tr>
<tr><td></td><td>27.2 Malnutrition in pregnant women and toddlers, lack of access to clean water and sanitation, limited access to health services, and infection</td></tr>
<tr><td></td><td>27.3
1. describe balanced nutrition and its importance, advice people to eat balanced nutrition
2. advise people to use clean water and to provide proper sanitation
3. advice people to keep their environment clean
4. inform the importance of breastfeeding and advice women to breastfeed their babies.
5. inform the importance of a balanced diet for pregnant women and advise pregnant women to eat a balanced diet.</td></tr>
</table>

28.	28.1 Block A is 20% of the volume is not immersed or 80% of the volume is immersed in water. If an object is floating, the ratio of the object's density to the liquid's density is equal to the ratio of the immersed part. So block A density is 80% from the density of water = 800 kg/m^3.
	28.2 Object's density = 800 kg/m^3 Volume (in m^3) = 0.2 x 0.2 x 0.2 = 0.008 m^3 So the mass of Object A is = 0.008 x 800 = 6.4 kg.
	28.3 If an object is floating, the ratio of the object's density to the liquid's density is equal to the ratio of the immersed part. The density of the liquid is 1200 kg/m^3. Percentage object's volume immersed in water $$\frac{800}{1200} \times 100\ \% = 75\ \%$$ So the height of an object that is not immersed in water is: $$0.25\ \times 20\ \text{cm} = 5\ \text{cm}$$
29.	29.1 (i) The air near the plastic bag is cooled and contracts. Hence, the cooler regions of air become denser and sink. The air from other region flows in to replace the cooler regions of air. This movement of air sets up a convection current. (ii) Air is a poor conductor of heat. Hence, the layer of air helps to prevent heat from the surround in entering the bag of ice through conduction. (iii) Energy needed to melt 100 g of ice, L_f = l_1 x m = 336,000 J/k x 0.1 kg = 33,600 J Time taken = 33,600 J ÷ 24 J/s = 1400 s

	29.2 Water in cup A (aluminum) is cold faster. (1.5 points) Aluminum or metal is a good heat conductor and clay is not a good conductor (insulator). In cup A the heat in hot water will be transferred to the cup and surrounding faster, so the water will be cold faster. (3 points)
30.	30.1 The bulb does not light up.
	30.2 The bulb lights up.
	30.3 She is trying to find out if electricity can pass through the three materials easily.