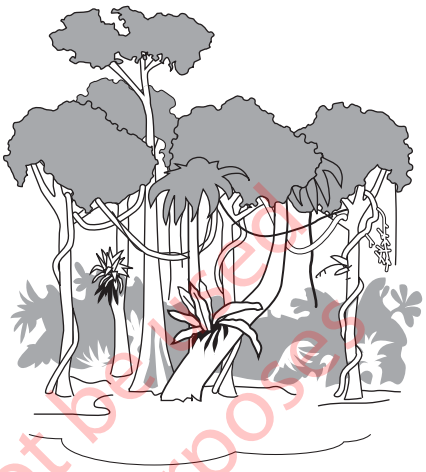
Appendix C
Example Science Items

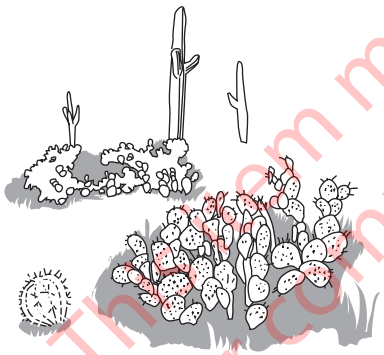
Example Science Items
Grade 4

1

Which of these types of plants are usually found growing in a tropical rain forest?

Ⓐ

*Ⓑ 

Ⓒ 

Ⓓ

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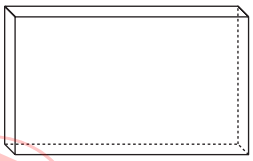
*Correct Answer

2

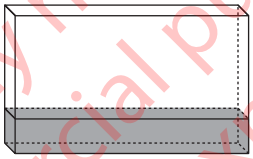
The figure **above** shows a box that contains a material that could be a solid, a liquid or a gas. The material is then put into a box four times as large.



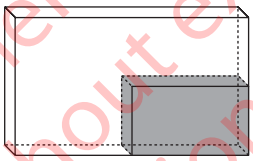
Look at the figures **below**. They show how the different types of material will look when put into the larger box.

A. Identify which figure shows a solid, which shows a liquid and which shows a gas. (Write the word *solid*, *liquid* or *gas* on the line next to each figure below. Use each word only once.)

liquid



solid



gas

B. Explain your answers.

Liquid is runny so it finds the lowest place in the box.

A solid can be everywhere in the box but it stays the same shape.

A gas takes up all the room it wants.

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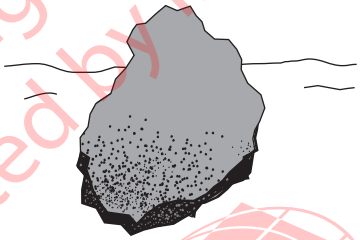
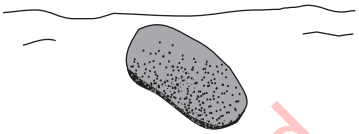
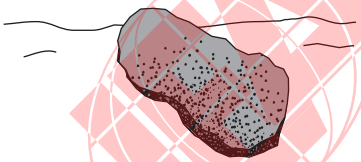
3

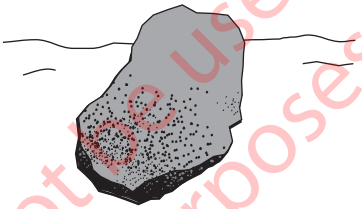
Lily found four rocks of the same material in a riverbed. They had different shapes and sizes.

Which rock has most likely been carried the farthest down the river?

Ⓐ 

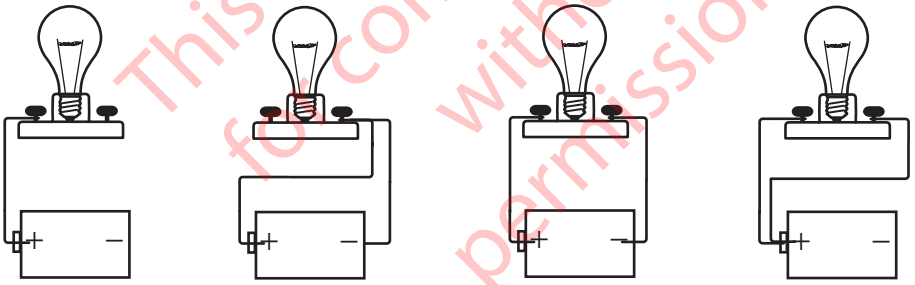
*Ⓑ 

Ⓒ 

Ⓓ 

4

The pictures show a lightbulb connected to a battery.
Which bulb will light?



Ⓐ Ⓑ *Ⓒ Ⓓ

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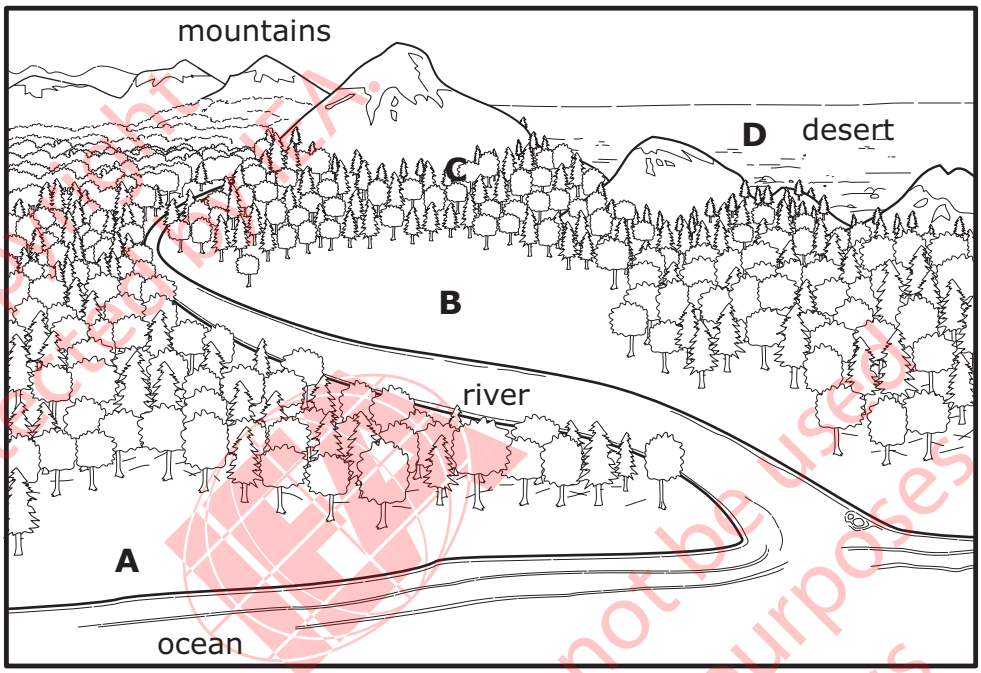
*Correct Answer

5



Look at the picture above. Where is the best location to grow crops?

Ⓐ Location A

*Ⓑ Location B

Ⓒ Location C

Ⓓ Location D

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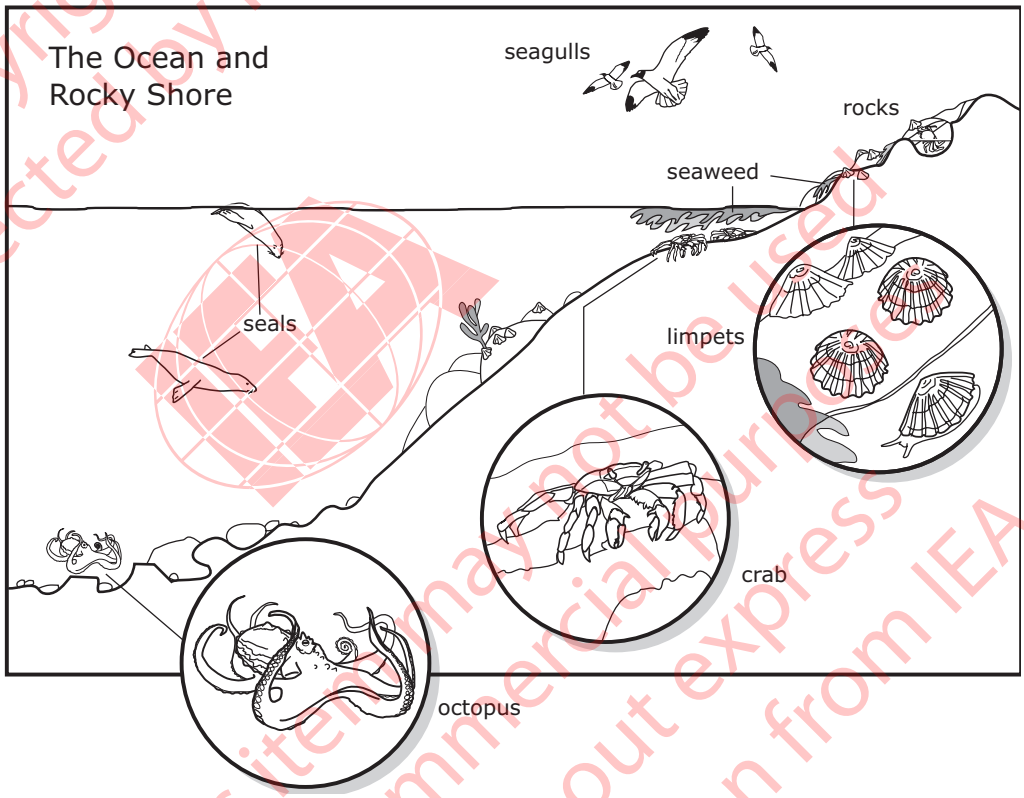
*Correct Answer

Ocean Food Chain

6

The picture below shows part of an ocean and some of the organisms (plants and animals) that live in and around the ocean.



Look at the list of living organisms (plants and animals) below. The table gives information about what each organism in the picture of the ocean needs for food.

Name of Organism	What the Organism Needs for Food
Seaweed	Sunlight to make its own food
Limpet	Seaweed
Crab	Limpets
Octopus	Limpets, crabs, and fish
Seagull	Crabs and fish
Seal	Crabs, octopus and fish

Questions for Ocean Food Chain begin on the next page.

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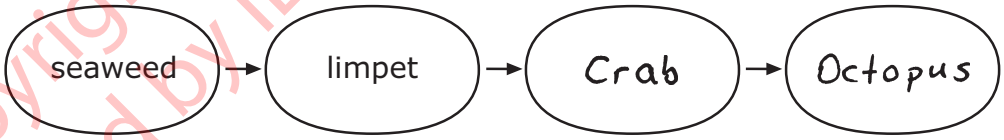
The diagram below shows part of a food chain. The arrows go from one organism to another organism that eats it. In this food chain, the limpets eat seaweed.



A. Complete the food chain **above** by writing the names of two other organisms from the table in the blank spaces. Use the information in the table about what each organism needs for food.
(There is more than one correct food chain. You need to show just one.)

B. One year a disease causes many limpets to die. What would happen to the **seaweed** in your food chain when the limpets die?

The amount of seaweed will grow because there isn't lots of limpets to eat it.

C. Choose another organism in your food chain (not seaweed or limpet).

Name of organism: Crab

What would happen to this organism when the limpets die?

Some crabs will die because there isn't a lot of limpets to eat.

D. What would happen to the other organisms in your food chain if the seaweed does not grow well?

The limpets will starve, so some crabs will die, so some octopuses will die. If one tiny thing happens to an animal or plant, it can affect the whole food chain.

End of Ocean Food Chain questions.

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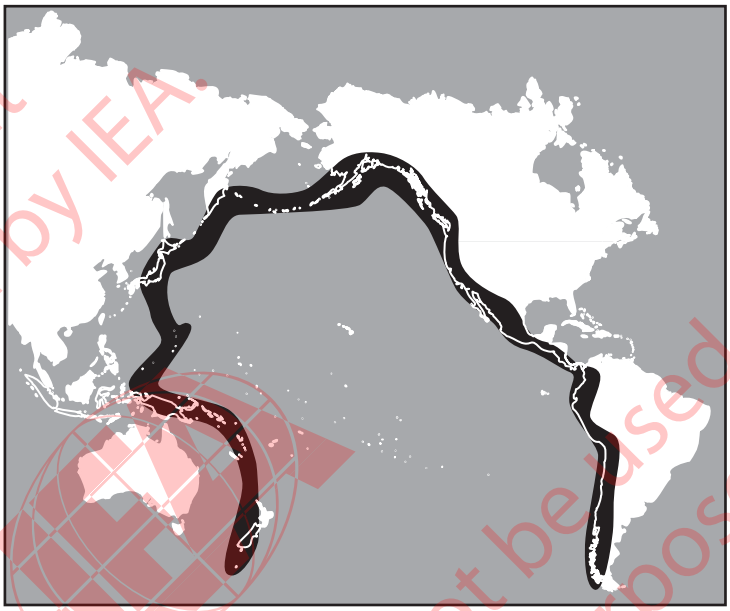
Example Science Items
Grade 8

1



The diagram above shows the Pacific Ring of Fire. Earthquakes and volcanic activity occur along the Ring of Fire. Which of the following best explains why?

* Ⓐ It is located at the boundaries of tectonic plates.

Ⓑ It is located at the boundary of deep and shallow water.

Ⓒ It is located where the major ocean currents meet.

Ⓓ It is located where ocean temperature is the highest.

*Correct Answer

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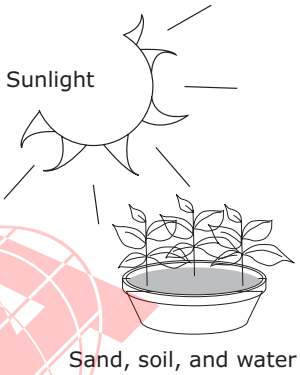
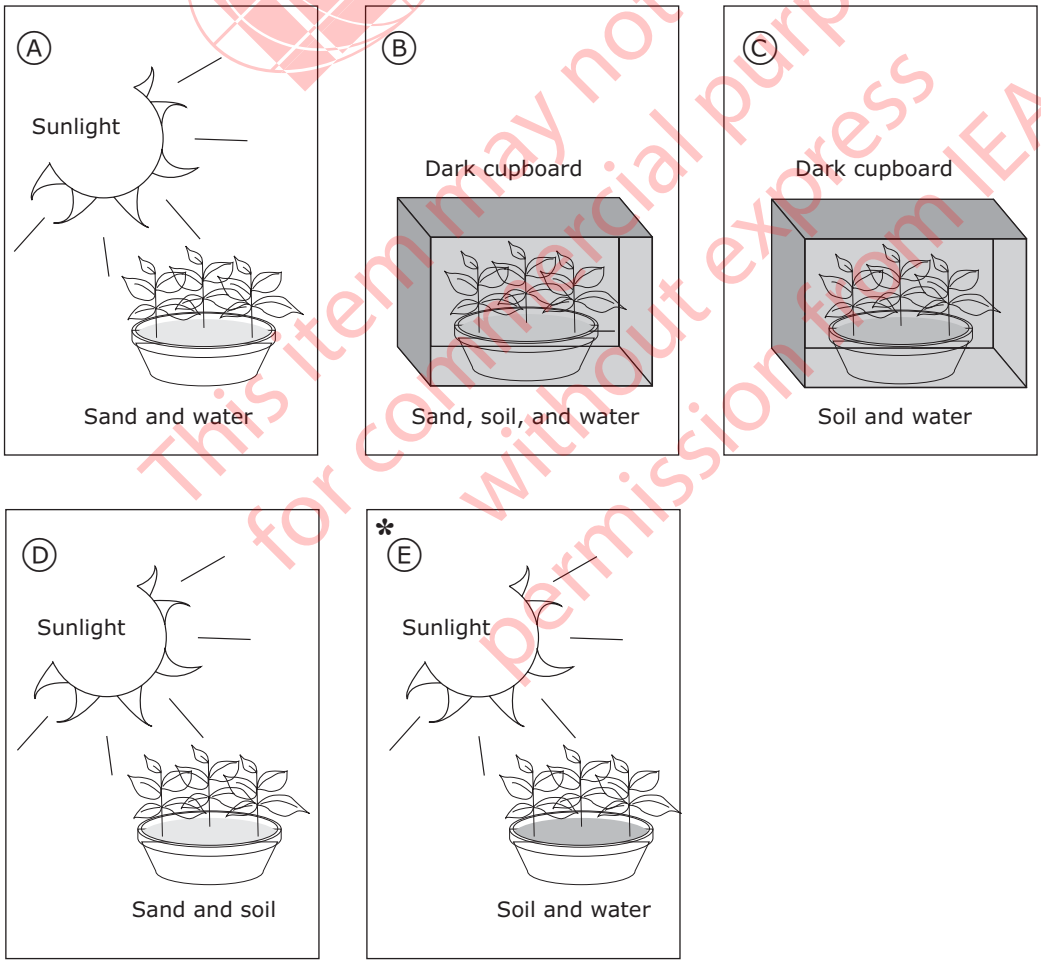
2

A girl has an idea that green plants need sand in the soil for healthy growth. In order to test her idea she uses two pots of plants. She sets up one pot of plants as shown below.



Which ONE of the following should she use for the second pot of plants?



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*Correct Answer

3

The picture shows how a student set up some apparatus in a laboratory for an investigation. The inverted test tube was completely filled with water at the beginning of the investigation as shown in Figure 1. After several hours, the level of water in the test tube had gone down as shown in Figure 2.

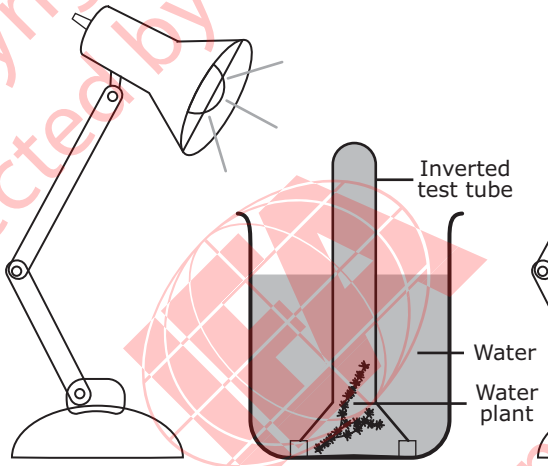

Figure 1

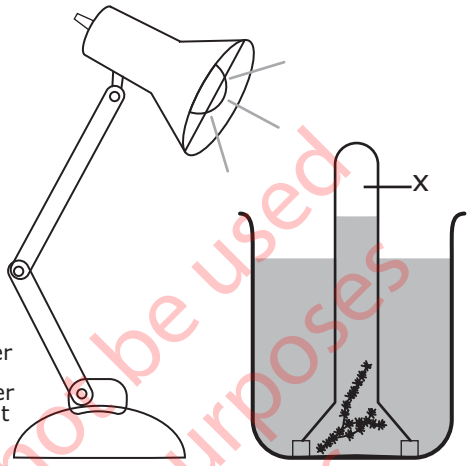

Figure 2

What is contained in the top part of the test tube labeled X in Figure 2?

(Check one box.)

- ☐ air
- ☑ oxygen
- ☐ carbon dioxide
- ☐ vacuum

Explain your answer.

During photosynthesis, plants produce oxygen and glucose.

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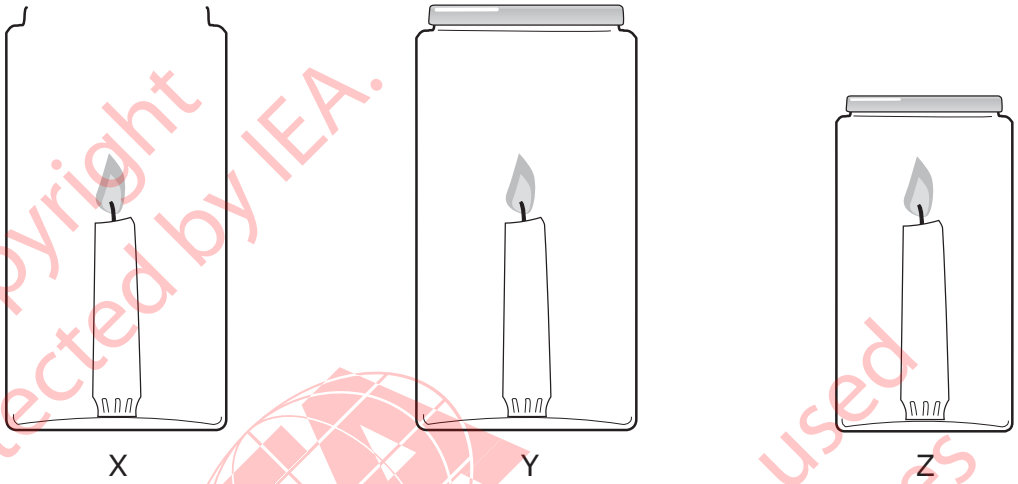
4



Three identical candles are placed in the three jars shown above and lit at the same time. Jars Y and Z are then sealed with lids, and Jar X is left open.

Which candle flame will go out first (X, Y, or Z)? Z

Explain your answer.

Z because fire needs oxygen to stay lit. With the lid being sealed no oxygen can get in. There is a little bit of air in there for it to stay lit. Since Z is smaller than Y, Z would go out first.

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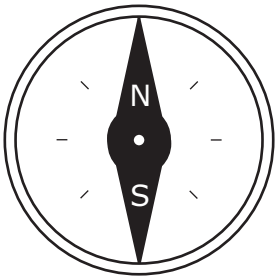
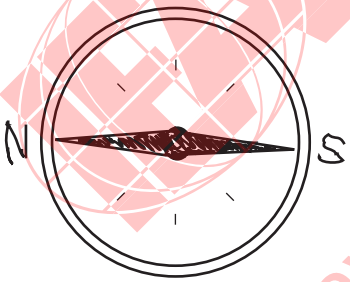
5



The diagram above shows a compass needle with its North and South poles labeled (N and S). It is placed next to a strong magnet as shown in the diagram below.



A. Draw the compass needle in the circle on the diagram above. Label the North (N) and South (S) poles of the needle.

B. Explain your answer using your knowledge of magnets.

The north pole on the magnet will attract the south pole. on the compass

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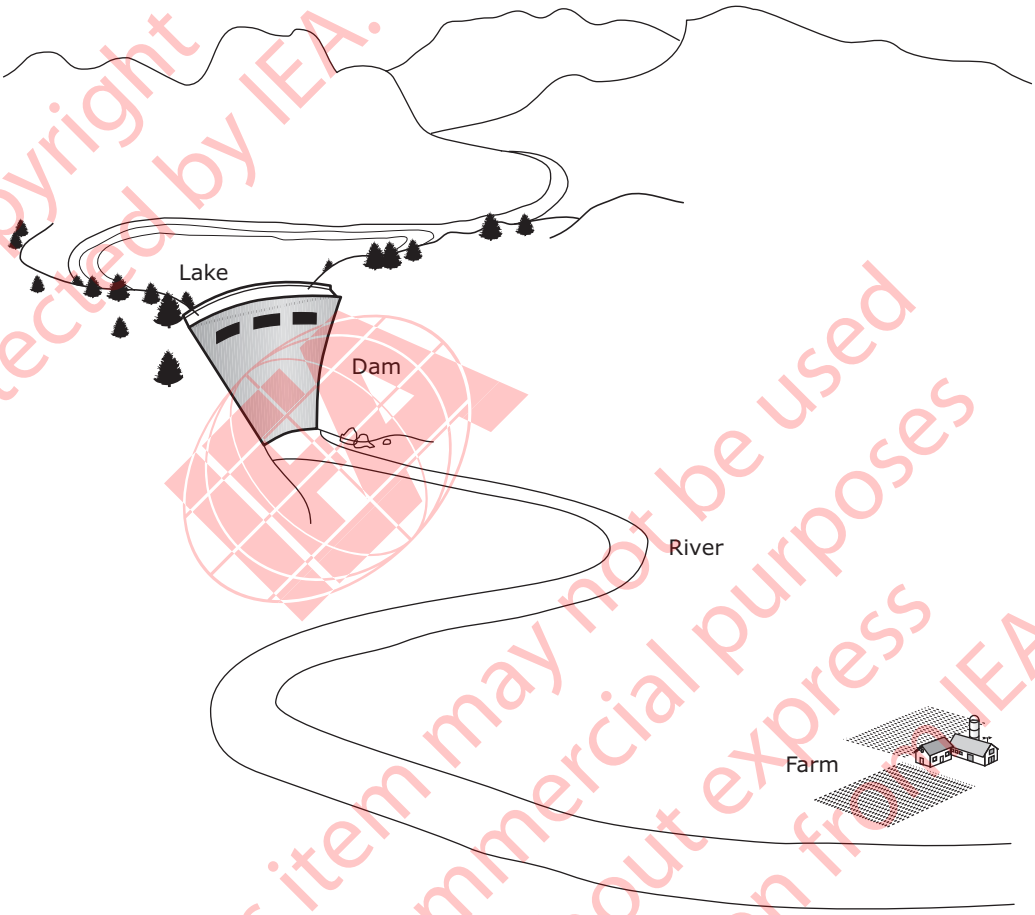
6

The diagram shows a farm in a valley where a dam has just been built.



The presence of the dam can have both positive and negative effects on farming in the valley.

A. Describe one positive effect of the dam on farming.

The dam will stop the water from flooding the field.

B. Describe one negative effect of the dam on farming.

Less irrigation because the dam may not let enough water flow through.

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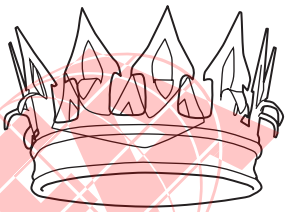
Metal Crown

Instructions: Questions **7**, **8**, **9**, **10** are about Metal Crown. To answer these questions you may refer to any information shown on the pages in the Metal Crown section.

A king gave a jeweler a block of pure metal. He asked the jeweler to make him a crown out of the metal.



metal crown

metal block

After the jeweler delivered the crown, the king observed it carefully. He thought that the jeweler might have substituted another pure metal or a mixture of metals to make the crown. He weighed the crown, and it had the same mass as the original block, 2400 grams. Still not satisfied, the king asked some scientists to help him find out what the crown was made of.

Questions for Metal Crown begin on the next page.

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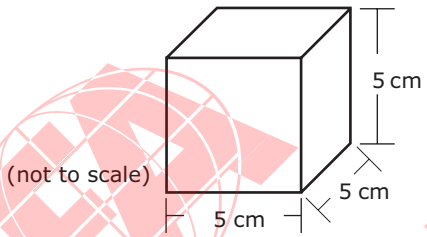
7

The scientists decided to compare the densities of the crown and a block of metal just like the originalblock. The density of a substance is the mass of a sample of the substance divided by its volume (density = mass/volume).

The scientists found the volume of the block and computed its density based on its known mass (2400g). The diagram below shows the dimensions of the block of metal that the scientists measured.



What is the density of the block of metal?

Answer: 19.2 g/cm^3

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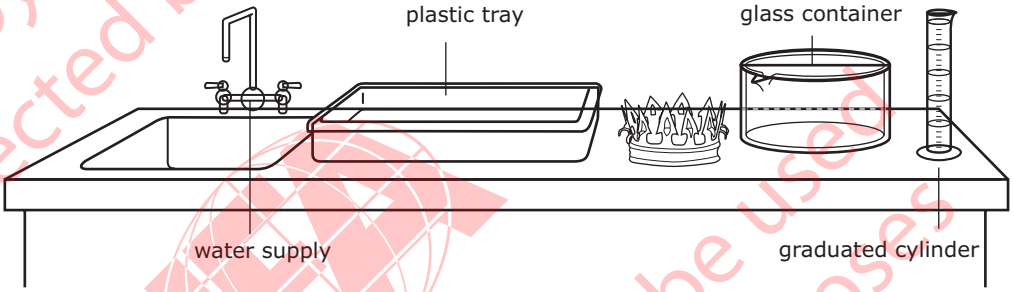
Questions for Metal Crown continue.

8

The scientists then needed to find the volume of the crown in order to determine its density. The following equipment and materials were available for them to use.



Describe a procedure that the scientists could use to find the volume of the crown using some or all of the equipment and materials shown above. You may use diagrams to help explain your procedure.

Fill the beaker with enough water to cover the crown. Add the crown and mark the side of the beaker where the water level is. Then take the crown out. Use the graduated cylinder to add little bits of water until the level comes back up to the mark. That is the volume of the crown.

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Questions for Metal Crown continue.

9

The scientists measured the volume of the crown five times. They computed the density for each volume measurement. Their results are shown in the table below.

Trial	Volume of Crown (cm^3)	Density of Crown (g/cm^3)
1	202	11.88
2	200	12.00
3	201	11.94
4	198	12.12
5	199	12.06

A. Why did the scientists measure the volume five times?

Because there is experimental error. So, measuring it 5 times you can calculate the average to know how much error there is.

B. The scientists reported to the king that the density of the crown was 12.0 g/cm^3. Show how the scientists used their results to obtain this value for the density.

They added together all of the densities and then divided by 5 to get the average.

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Questions for Metal Crown continue.

10

The table below lists the density for different metals.

Metal	Density (g/cm^3)
Platinum	21.4
Gold	19.3
Silver	10.5
Copper	8.9
Zinc	7.1
Aluminum	2.7

A. Look at the density you computed for the block of metal. What was the block of metal most likely made of?

Answer: Gold

Explain your answer.

It had the closest density.

B. The density of the crown was found to be 12.0 g/cm^3. What would you report to the king about what metal or mixture of metals the jeweler used to make the crown?

The jeweler used some silver as well as gold.

End of Metal Crown section.

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