



P.7 SCIENCE -STUDY LESSONS SET 4

Dear candidate, this set of work is purely revision. You are required to use your P.5 Science notes or a P.5 Science text book most preferably MK Integrated Science to read about this topic and thereafter answer the given questions. These have been arranged in segments to help you complete the reading with ease.

THEME : MATTER AND ENERGY
TOPIC : HEAT ENERGY
CONTENT: MATTER

Understanding matter

- There are a lot of things/objects around us. Some can be seen while others can't be seen. Such objects include; stones, basins, knives, water, air, cups, pots, etc.
- The common thing with all of them is that they can fill up(occupy)any space and have weight.
- So, whatever occupies space and has weight is regarded as matter.
- Therefore, **Matter is anything that occupies space and has weight.**

All those things/objects you see around you (matter) are made of tiny particles called **molecules**.

The arrangement of the molecules brings about the different forms/states of matter i.e.

- i) Solids
- ii) Liquids
- iii) Gases

States of matter refers to the appearance/arrangement of molecules of matter. They include: solids, liquids and gases.

In this segment, we are going to revise our P.5 notes about matter, states of matter, properties of matter, characteristics/properties of solids, liquids and gases and thereafter answer the questions below.

Activity 1

States of matter

1. State any one form in which matter exists.

2. Why is oxygen said to be in the gaseous state?

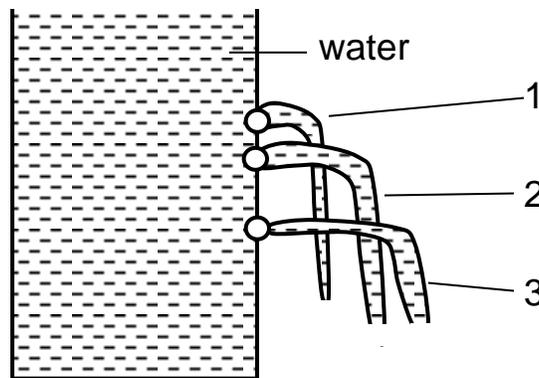
3. Which property of matter is demonstrated when inflating a balloon?

4. How is the arrangement of molecules in solids different from that in gases?

5. Identify the property of liquids that enables them to pour.

6. Why is electricity not regarded as matter?

The diagram below shows an experiment carried out by P.5 children about pressure in liquids. Use it to answer questions 7, 8 and 9.



7. What does the experiment prove about pressure in liquids?

8. Why do you think pipe 3 jets out water at a farther distance than pipes 1 and 2?

9. State one way the above property is useful in our homes.

10. Which force enables paint to stick on the walls of buildings?

11. In which state of matter is water at 100°C ?

12. How is heat transfer in liquids similar to that in gases?

13. James farted from one corner of the classroom and the smell reached the teacher who was in front. Which process enabled the smell to move from James to the teacher?

14. Give any two examples of viscous liquids.
i) _____
ii) _____
15. Which process of heat transfer helps farmers dry their harvested crops?

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Activity 2

Changes of states of matter

- Like we have seen that matter exists in different forms (states), these forms can change from one form to another.
- This happens when one of these two things happen:
 - When matter gains heat (when exposed to hot temperatures)
 - When matter loses heat (when exposed to very cold temperatures)
- For example, when you keep water in a refrigerator for long, it turns into ice. That is a change of state i.e. from a liquid(water) to a solid(ice). The cause of that change of state is exposing water to very cold temperatures in the refrigerator (heat loss).
- When you heat water, it turns into vapour, the change of state here is that a liquid(water) changes to gas(vapour). The cause of this change is exposing water to high temperatures (heat gain).

Note;

- Some other changes of states of matter are in your note book with their causes.

- Using your Primary Five classwork book, or text book read about the changes of states of matter and highlight the cause (either heat loss or heat gain) of each and then answer the questions below.

1. Why is dew formed at night?

2. Name any three processes involved in rain formation.

i) _____

ii) _____

iii) _____

3. What is the role of the sun in rain formation?

4. In which way do plants contribute to the formation of rainfall?

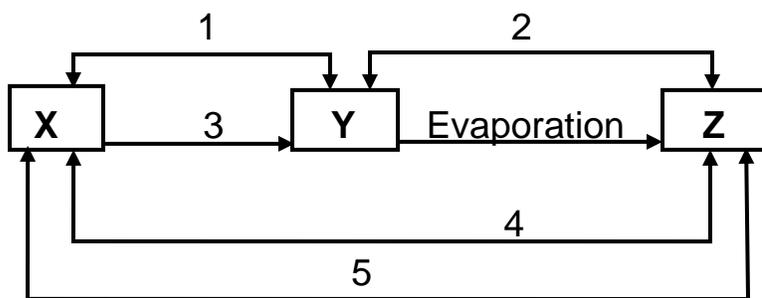
5. What happens to the volume of water when it freezes?

6. How is freezing useful in the economic development of people in Uganda?

7. State one danger of evaporation in the environment.

8. Name the substance which exists in all states of matter.

The diagram below shows changes in states of matter. use it to answer questions that follow.



9. Identify the states of matter marked with letters X, Y and Z.

i) X _____

ii) Y _____

iii) Z _____

10. Which numbers represent processes that take place due to;
i) heat gain? _____
ii) heat loss? _____
11. Name the processes marked with numbers 2,4 and 5.
i) 2 _____
ii) 4 _____
iii) 5 _____
12. What name is given to water in the gaseous state?

Activity 3

Mixtures

- A mixture is a combination of two or more substances.
- Usually in our homes, we make different mixtures for different reasons. However, sometimes things just mix up accidentally (when we didn't want them to mix). For example, when our salt pours in dust, when dust falls in water, when stones mix up with rice, etc.
- So here you are going to revise about;
 - Examples of mixtures (as many as you can).
 - Reasons for making some mixtures.
 - Methods/ways of separating mixtures.

Then you will carry out an experiment on how to separate salt from a salt solution

1. Why is salt regarded as a solute?

2. How is sugar useful in ORS?

3. Why is winnowing necessary in crop growing?

4. Which method is used by school cooks to separate stones from beans before preparation?

5. How can salt be recovered from a salt solution?

6. Kevin accidentally poured oil in water. After some time, the two liquids settled.

Draw a diagram to show how the two liquids settled.



7. Why did the two liquids settle the way you have shown above?

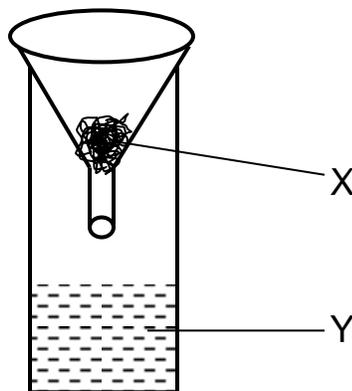
8. How can Kevin separate the two liquids above?

9. Why can't a magnet be used to separate iron filings from iron nails?

10. Why is decanted water not safe for drinking?

11. Why is distilled water not good for drinking?

The diagram below shows a method of separating mixtures. Use it to answer questions that follow.



12. Name the method of separating mixtures shown above.

13. What scientific is given to the substances X and Y?

i) X _____

ii) Y _____

14. How is the filter paper useful in the above method?

15. Why is the water prepared by the above method not safe for drinking?

16. Apart from the above, name two other methods of separating mixtures.

i) _____

ii) _____

Activity 4

Energy

Introduction

For all the types of work that we do, we need energy to do it.

We can't do any piece of work without the use of energy and that's why **Energy is the ability to do work.**

Energy exists in different types and forms.

Note:

Energy can neither be created nor destroyed but can be changed from one type to another or from one form to another.

Read your lesson notes or MK P5 Science text book to learn more about energy, then answer the questions below:

1. State the difference between energy and force.

2. A truck was seen moving at a very high-speed carrying sacks of charcoal. What type of energy was possessed by;

i) truck? _____

ii) Sacks of charcoal? _____

3. Give two characteristics of forms of energy.

i) _____

ii) _____

4. Why is light regarded as a form of energy?

5. In which way is heat similar to light besides being forms of energy?

6. Which force enables boats to float on water?

7. In one sentence, give the meaning of friction.

8. State any two ways friction is useful to a P.7 candidate.
i) _____
ii) _____
9. Give one way in which friction is a nuisance force.

10. State one-way gravity is useful in our daily life.

11. Why is it difficult to push a wheel barrow uphill than downhill?

12. Why does a stone thrown in air fall down after some time?

13. Which energy change take place in the following devices when functioning?
i) dry cell _____
ii) electric bulb _____
iii) generator _____
iv) burning wood _____
v) electric motor _____

Activity 5

Heat energy

- We looked at the different forms of energy and realized that most of them are commonly used in our day to day activities. One of them can cause increase in temperature and that is **heat energy**.

Note:

- Heat energy is measured using a calorimeter and given in units known as calories.
- Refer to your P.5 notes or text book on heat energy for more facts about heat as a form of energy to help you attempt the revision exercise below

1. What is heat energy?

2. Identify any two artificial sources of heat.
i) _____
ii) _____

3. State the role of heat in preservation of food.

4. How is heat dangerous to a crop farmer?

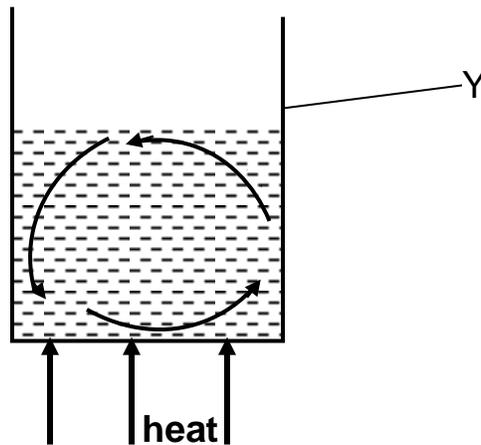
5. Give any two ways heat affect matter.
i) _____
ii) _____
6. How is the sun useful in the environment?

7. How does heat move through the following?
i) water _____
ii) air _____
iii) brick _____
8. Why does heat move through solids by conduction?

9. Give one way radiation is important in our daily life.

10. Which method of heat transfer enables air circulation in a house?

The diagram below shows an experiment carried out by P5 children. Use it to answer questions that follow.



11. How does heat from the fire reach the saucepan?

12. By what process does heat pass through container Y?

13. What do the arrows in the water represent?

14. State one way in which convection is useful in our environment?

15. How do school children in the dormitories apply conduction?

Activity 6

Conductors and insulators

- You have observed your mothers cook and during the cooking, the saucepans or kettles get hot after gaining heat.
 - If you have noticed, when your mother wants to remove the hot saucepan or kettle from the stove, she may use papers, or even pieces of cloths. There are two points to learn here;
 - When you place a sauce pan on the stove it becomes hot. This is because the material from which it was made allows heat to pass through it. Such materials are called **conductors of heat**. They include; silver, iron aluminum, copper, steel etc.
 - The piece of cloth is used to lift a hot sauce pan to prevent the hands from being burnt. This means a piece of cloth does not allow heat to pass through it. We therefore call it an **insulator**. Other insulators include, paper, plastics, rubber, wood. etc.
 - So here we are going to revise our notes about conductors and insulators, list examples of heat conductors and insulators.
 - Note and record situations where conductors and insulators are useful to us (application of conductors and insulators in our daily life)
 - You will also revise about heat reflectors and heat absorbers and thereafter answer the questions below.
1. How are conductors of heat different insulators of heat?

2. Name two examples of heat conductors.

i) _____

ii) _____

3. Why are sauce pans made of aluminum?

4. How is soot useful on an old saucepan?

5. Give two examples of heat insulators.
i) _____
ii) _____
6. Why would you advise a mother to use pieces of paper when carrying a hot frying pan?

7. How do school sweaters keep children warm when it's cold?

8. Why does tea in a metallic cup cool faster than that in a plastic cup?

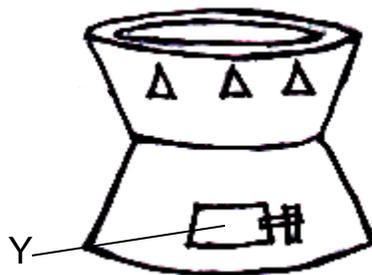
9. Why are people advised to paint their houses with bright colours?

10. Two pieces of cloth, one black and one white of the same material were washed and spread under sunshine at the same time.
a) Which of the two pieces dried fast?

- b) Give a reason for your answer in (a) above.

11. How does covering of food while cooking make it get ready quickly?

The diagram below shows a clay made charcoal stove. Use it to answer questions that follow.



12. State the use of hole marked Y.

13. Name the fuel used in the above stove.

14. How is the use of the above stove environmentally friendly?

15. Why is clay used in the stove above?

16. How does a vacuum prevent heat loss or gain in a vacuum flask?

Activity 7

Temperature:

- In our last segment, we are going to look at temperature; how it is measured, the instrument used and units in which it is measured, the types of thermometers, their features and their uses, temperature scales and temperature conversion.
 - Again, use the P5 Science text book or your P5 classwork book to go over those areas and then answer the questions below;
1. What is temperature?

 2. In which units is temperature measured?

 3. How are the following types of thermometers useful?
 - a) clinical thermometer

 - b) Six's thermometer.

 4. Why does an inflated balloon burst when left under sunshine for some time?

 5. Why is a soda bottle not filled up to the brim during packing?

 6. How are electric wires on electric poles prevented from breaking especially during cold days?

 7. Convert:
 - a) 50°C to $^{\circ}\text{F}$.

b) 104°F to $^{\circ}\text{C}$.

8. State two ways of putting out fire.

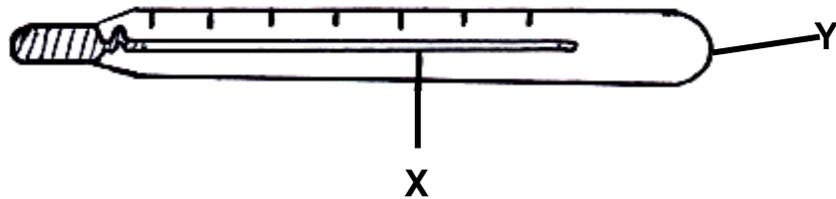
i) _____

ii) _____

9. Give any one condition that aids rusting of metals.

10. How is burning similar to rusting?

11. Use the diagram below to answer questions that follow.



12. Name the parts labeled X and Y.

i) X _____

ii) Y _____

13. State the function of the kink in the thermometer above.

14. How is the above thermometer reset?

15. Give any one way of disinfecting the above thermometer.
