



UPPER PRIMARY

Advance Science

E-Booklet

Part 3



Discovering the Periodic Table

Upper Primary Advance Science

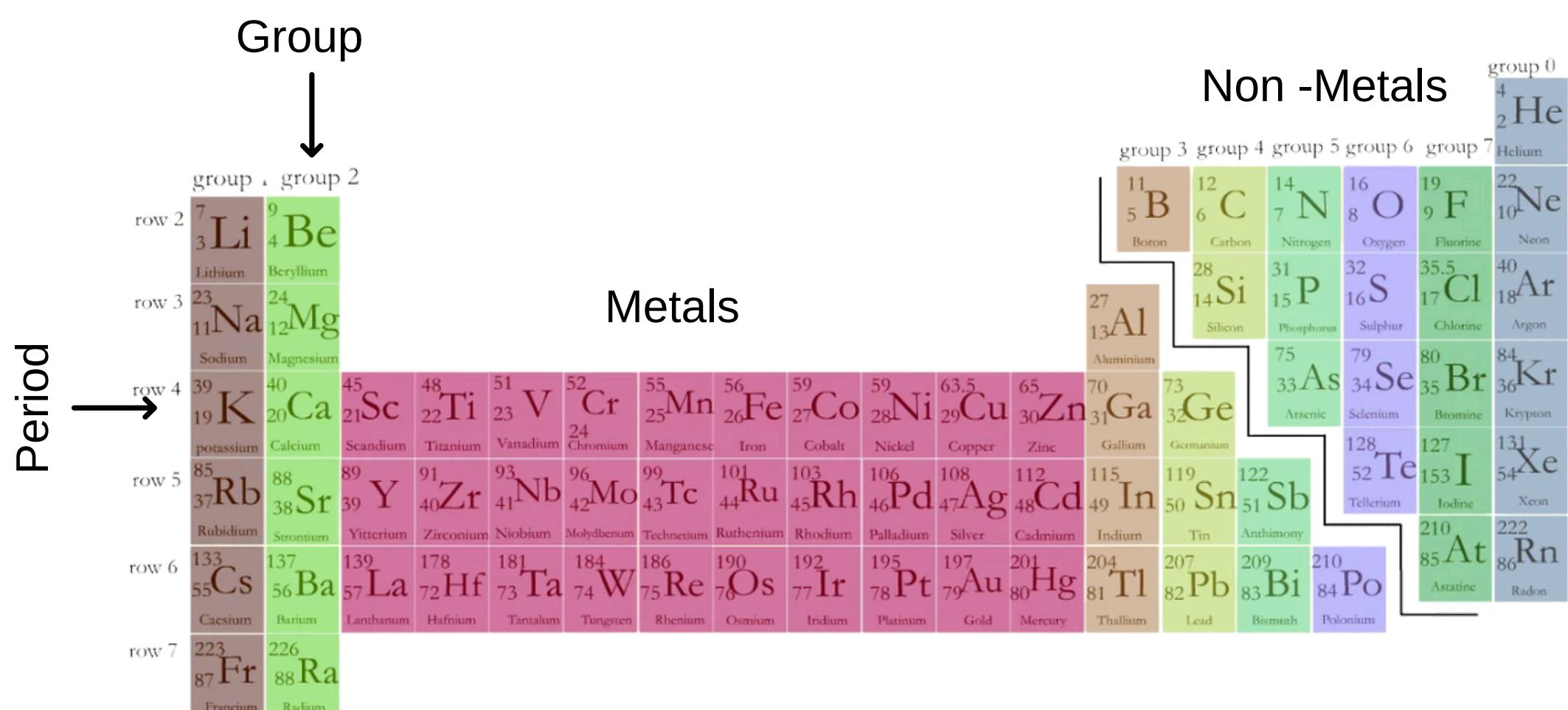
Answer the questions after reading the passage. Circle your answers.

In 1869, a Russian scientist named Dmitri Mendeleev created the periodic table by arranging elements in order of increasing atomic number, which is the number of protons in an atom's nucleus.

The table has rows called **periods** and columns called **groups**. Elements in the same group share similar properties, like reactivity. For example, the alkali metals in Group 1, such as lithium and sodium, react strongly with water.

Metals occupy the left side and center, while nonmetals are on the right, separated by a zigzag line. The first 20 elements include familiar ones like hydrogen (H), oxygen (O), and carbon (C), which form the building blocks of everything around us—from air to our bodies.

Mendeleev left gaps for undiscovered elements, predicting their properties accurately, which proved his genius



Discovering the Periodic Table

Upper Primary Advance Science

Questions

1. In what year did Dmitri Mendeleev create the periodic table?
 - a) 1769
 - b) 1869
 - c) 1969
 - d) 1896
2. How are elements arranged in the periodic table?
 - a) By color
 - b) By increasing atomic number
 - c) By size of atoms
 - d) Alphabetically
3. What are the rows in the periodic table called?
 - a) Groups
 - b) Metals
 - c) Families
 - d) Periods
4. Which group contains alkali metals like lithium and sodium?
 - a) Group 1
 - b) Group 7
 - c) Period 1
 - d) Period 2
5. Where are most metals located on the periodic table?
 - a) Right side
 - b) Left side and center
 - c) Top row
 - d) Bottom row

Discovering the Periodic Table - Solutions

Upper Primary Advance Science

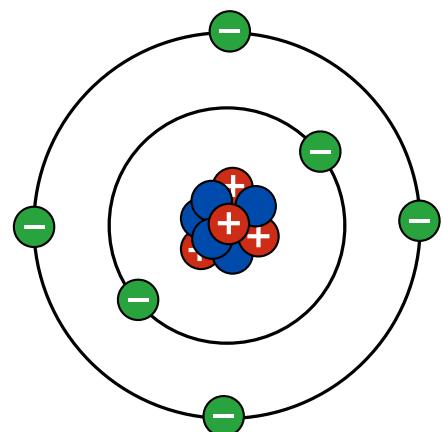
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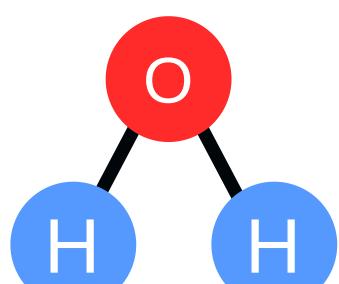
Atoms & Molecules

Upper Primary Advance Science

Answer the questions below.



An **atom** is the basic unit of matter. It consists of an atomic nucleus made up of protons which is positively charged & neutrons with no charge. Negatively charged electrons orbit the nucleus.



A **molecule** is a group of two or more atoms that are attracted to each other by chemical bonds.

Example: Water is made up of two hydrogen atom and one oxygen atom bonded together.

Word Bank: electrons nucleus protons atom molecule

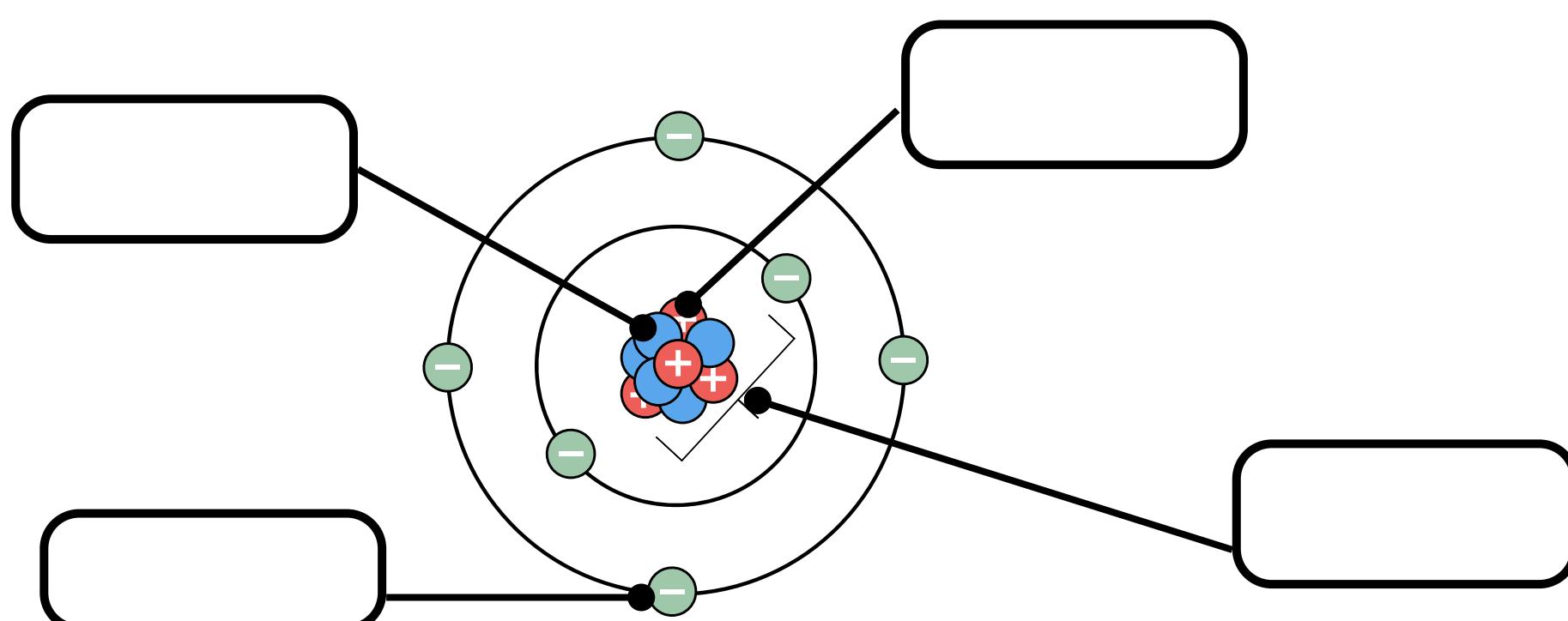
1. The smallest particle of an element is called an _____.
2. A _____ is two or more atoms bonded together, like H_2O (water)
3. The center of an atom with protons and neutrons is the _____.
4. _____ are positively charged particles in the nucleus.
5. _____ are negatively charged particles orbiting the nucleus.

ELECTRON

PROTON

NEUTRON

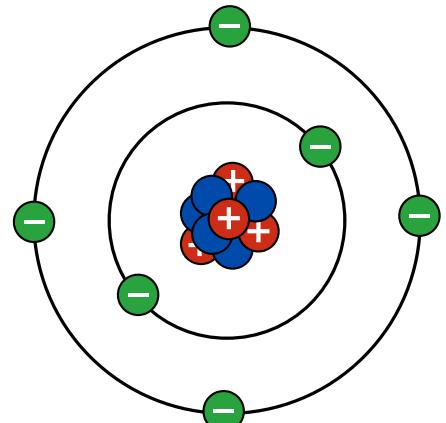
NUCLEUS



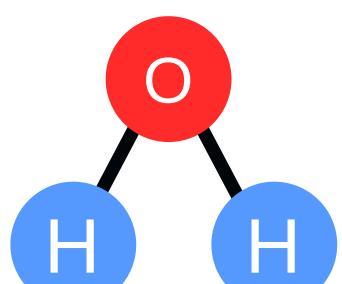
Atoms & Molecules - Solutions

Upper Primary Advance Science

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A **molecule** is a group of two or more atoms that are attracted to each other by chemical bonds.

Example: Water is made up of two hydrogen atoms and one oxygen atom bonded together.

Word Bank: electrons nucleus protons atom molecule

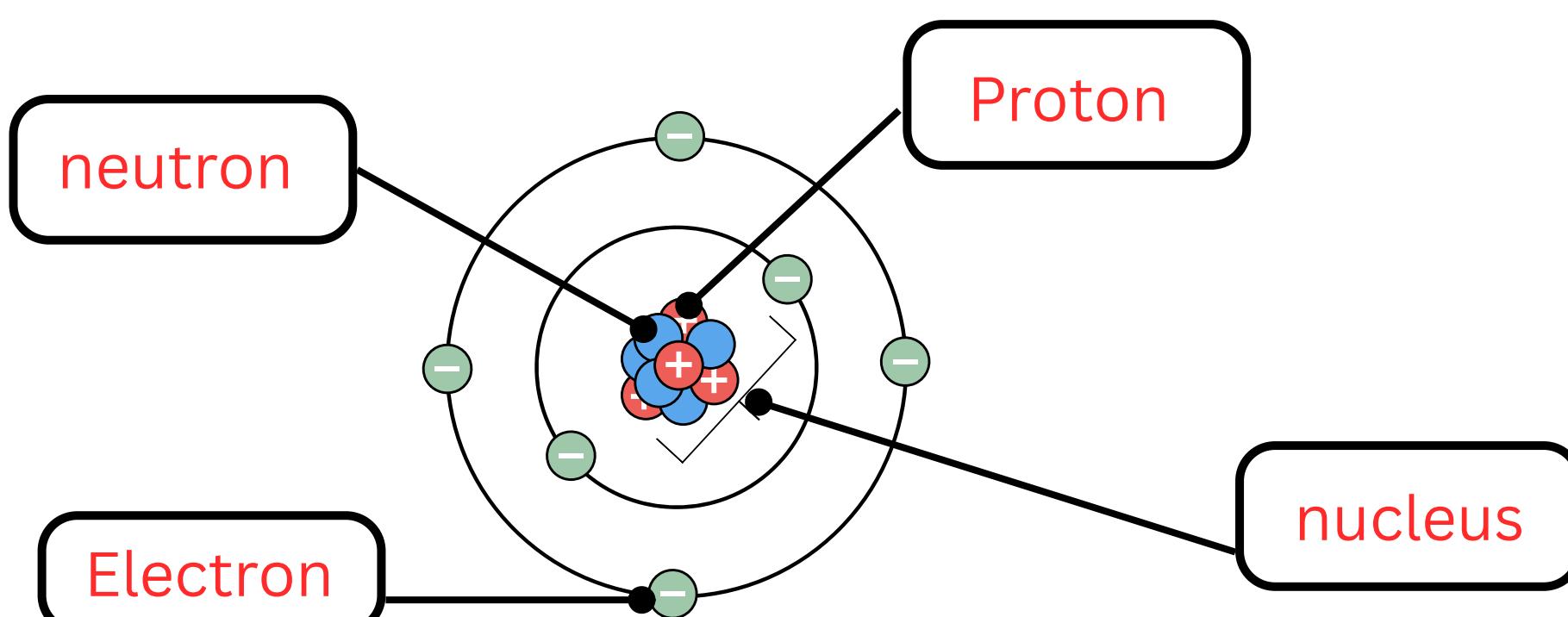
1. The smallest particle of an element is called an atom.
2. A molecule is two or more atoms bonded together, like H_2O (water)
3. The center of an atom with protons and neutrons is the nucleus.
4. Protons are positively charged particles in the nucleus.
5. Electrons are negatively charged particles orbiting the nucleus.

ELECTRON

PROTON

NEUTRON

NUCLEUS



Light Behaviours & Materials

Upper Primary Advance Science

Match the term to its definition.

Transparent

Bounces light

Translucent

Spreads light into colours

Opaque

Bends light

Refract

Blocks all light

Reflect

Lets some scattered light through

Absorb

Lets light pass clearly

Disperse

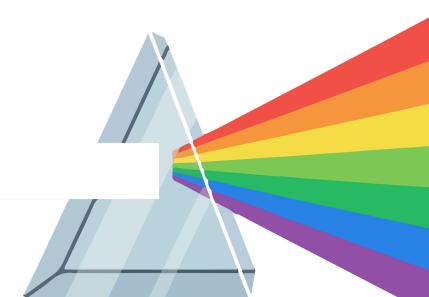
Takes in light

Circle True or False

1. A mirror reflect light. (True / False)
2. Rainbows form by dispersion. (True / False)
3. Refraction happens in water. (True / False)

Answer the questions

1. What happens when light hits a black shirt?



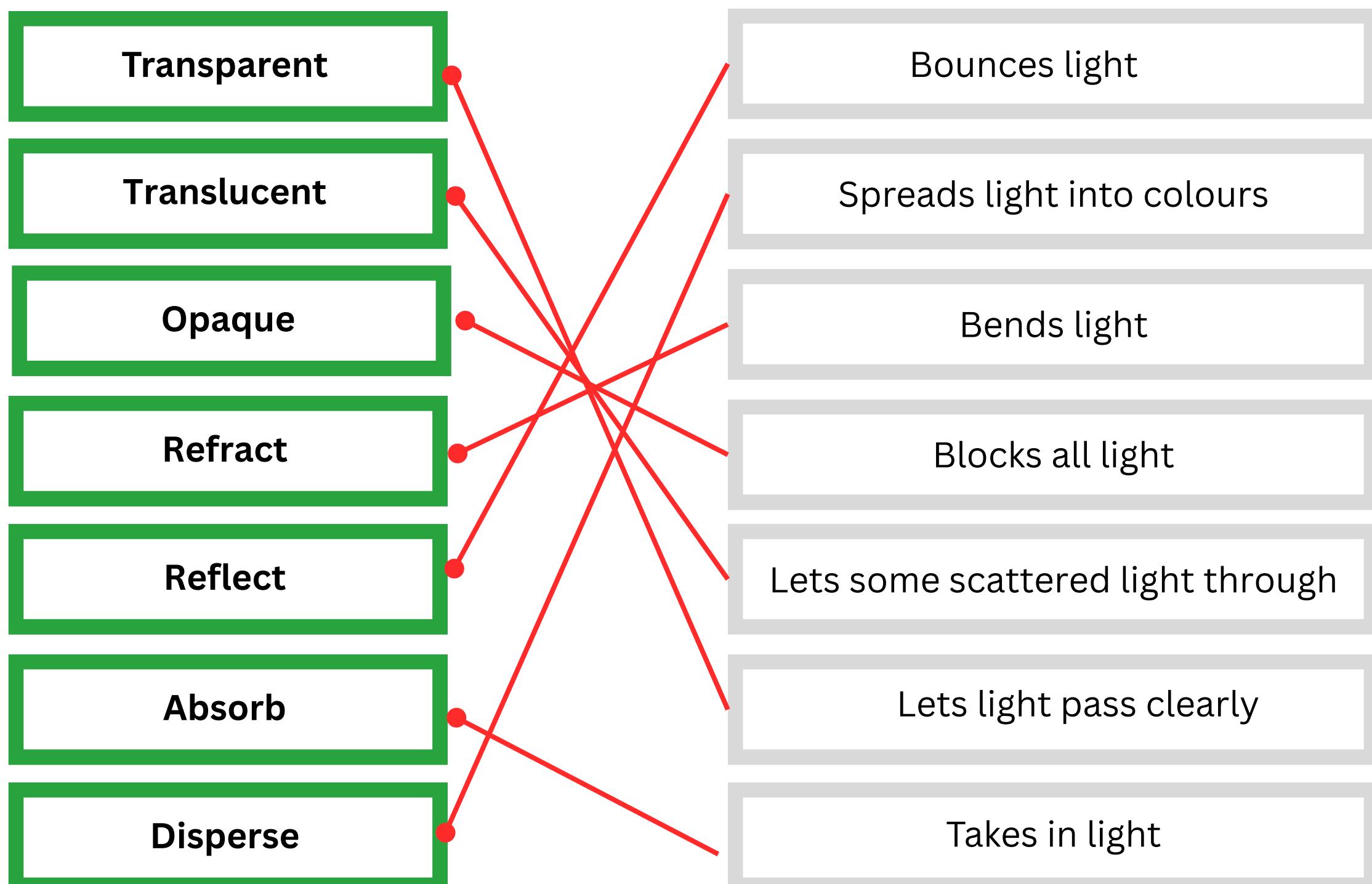
2. Name something that refracts light.



Light Behaviours & Materials - Solutions

Upper Primary Advance Science

Match the term to its definition.



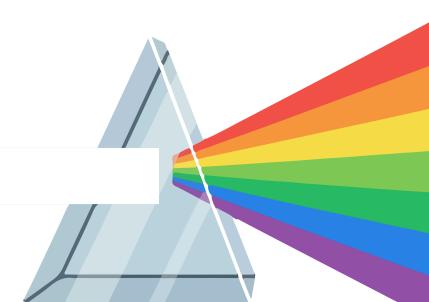
Circle True or False

1. A mirror reflect light. (True / False)
2. Rainbows form by dispersion. (True / False)
3. Refraction happens in water. (True / False)

Answer the questions

1. What happens when light hits a black shirt?

It absorbs the light.



2. Name something that refracts light.

Prism / Water



Mixtures and Solutions

Upper Primary Advance Science

Mixtures & Solutions

Everything around us is made up of different substances. Sometimes these substances are combined together, but not chemically joined are called **mixtures**. A mixture is a combination of two or more substances where each substance keeps its own properties. For example, a fruit salad is a mixture of different fruits that can still be separated easily.



There are two main types of mixtures: homogeneous and heterogeneous.

A **homogeneous** mixture has the same appearance and composition throughout. You cannot see the different parts. For example, salt water is a homogeneous mixture because the salt dissolves completely in the water, making it look uniform.

A **heterogeneous** mixture, on the other hand, has visibly different parts. For example, a bowl of cereal with milk or a sand and water mixture are heterogeneous because you can see and separate the components.

A special kind of homogeneous mixture is called a solution. A **solution** is formed when one substance dissolves in another. The substance that dissolves is called the **solute**, and the substance that does the dissolving is called the **solvent**. For example, in salt water, salt is the solute and water is the solvent. In lemonade, sugar and lemon juice are solutes dissolved in water, which acts as the solvent.

Mixtures and solutions play an important role in our daily lives. When we stir sugar into our tea, make juice from cordial, mix soil for gardening, or inhale clean air, we are dealing with mixtures and solutions.

Air itself is a mixture of gases such as nitrogen, oxygen, and carbon dioxide. Understanding mixtures helps us in cooking, cleaning, and even in scientific industries like medicine and chemical production.



Mixtures and Solutions

Upper Primary Advance Science

1. What is a mixture?
 - a) A chemical compound
 - b) A combination of substances not chemically joined
 - c) A pure substance
 - d) A single element
2. Which of the following is a homogeneous mixture?
 - a) Salad
 - b) Sand and water
 - c) Salt water
 - d) Cereal with milk
3. In a solution, the solute dissolves the solvent. (True/False)
4. A heterogeneous mixture looks the same throughout. (True/False)
5. Air is an example of a mixture. (True/False)

Fill in the blanks.

6. A mixture is made up of two or more _____ that are not chemically joined.
7. The substance that dissolves in a solution is called the _____.
8. The substance that does the dissolving is called the _____.
9. Salt water is made of salt (solute) and _____ (solvent).

Mixtures and Solutions

Upper Primary Advance Science

10. A bowl of cereal and milk is a _____ mixture.

11. Explain how a homogeneous mixture differs from a heterogeneous mixture in your own words.

12. Give two examples of mixtures or solutions you use in your daily life.

Circle whether it is homogeneous or a heterogeneous mixture.



milk

Homogeneous

Heterogeneous



cookies

Homogeneous

Heterogeneous

Mixtures and Solutions - Answers

Upper Primary Advance Science

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Mixtures and Solutions - Answers

Upper Primary Advance Science

10. A bowl of cereal and milk is a heterogeneous mixture.

11. Explain how a homogeneous mixture differs from a heterogeneous mixture in your own words.

Homogeneous mixtures look the same throughout;

heterogeneous mixtures have visibly different parts.

12. Give two examples of mixtures or solutions you use in your daily life.

Tea with sugar (solution), fruit salad (mixture),

air (mixture), or juice (solution).

Circle whether it is homogeneous or a heterogeneous mixture.



milk

Homogeneous

Heterogeneous

Heterogeneous (fat globules separate if left standing)



cookies

Homogeneous

Heterogeneous

Heterogeneous (chips + dough visible)