



# **UPPER PRIMARY**

## **Advance Science**

### **E-Booklet**

### **Part 1**



## Food Chains in Nature Comprehension

Upper Primary Advance Science

### **Energy Flow in Food Chains: Understanding How Living Things Depend on Each Other**

Every living thing needs energy to grow, move, and survive. In nature, energy flows from one organism to another through a food chain. A food chain shows the connection between living things, each depending on the other for food. It usually begins with producers, such as green plants and algae, which make their own food using sunlight through photosynthesis and providing energy for all other organisms in the chain.



Next in the chain are consumers, which eat other organisms to get energy. Herbivores are animals that eat plants, like rabbits, kangaroos, or grasshoppers. Carnivores, such as lions or hawks, eat other animals, while omnivores, like humans and bears, eat both plants and animals. The arrows in a food chain show the direction of energy flow – from the organism being eaten to the one doing the eating.

At the end of the food chain come decomposers, such as fungi and bacteria. They break down dead plants and animals into simple substances that return nutrients to the soil. This process helps new plants grow, beginning the energy cycle again.

A simple example of a food chain is:

Grass → Grasshopper → Frog → Snake → Eagle. Each step, or link, in this chain plays a vital role in keeping ecosystems balanced and healthy.

**Read the passage above and answer the questions that follow.**

1. What is a food chain?

2. Which is always at the start of a food chain?

3. What do we call animals that eat only plants?

4. In the food chain Grass → Rabbit → Fox, what is the rabbit?



## Food Chains in Nature Comprehension

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**Read the passage above and answer the questions that follow.**

5. Which arrow direction shows the correct flow of energy? Circle it.

Producer → Consumer

Consumer → Producer

6. Explain why producers are the most important part of the food chain.

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7. What might happen if all herbivores disappeared from an ecosystem? 

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8. Describe how decomposers help keep the environment clean. 

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9. Give an example of a food chain you might find in your local area.

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## Food Chains in Nature Comprehension - Solutions

Upper Primary Advance Science

**Read the passage above and answer the questions that follow.**

1. What is a food chain?

A series showing how energy passes from one organism to another

2. Which is always at the start of a food chain?

Producer

3. What do we call animals that eat only plants?

Herbivores

4. In the food chain Grass → Rabbit → Fox, what is the rabbit?

Primary consumer

5. Which arrow direction shows the correct flow of energy? Circle it.

Producer → Consumer

Consumer → Producer

6. Explain why producers are the most important part of the food chain.

Producers create food using sunlight, providing energy for all other

organisms in the chain.

## Food Chains in Nature Comprehension - Solutions

Upper Primary Advance Science

**Read the passage above and answer the questions that follow.**

7. What might happen if all herbivores disappeared from an ecosystem?

Carnivores would lose their food source and die out, upsetting the entire balance of the ecosystem.

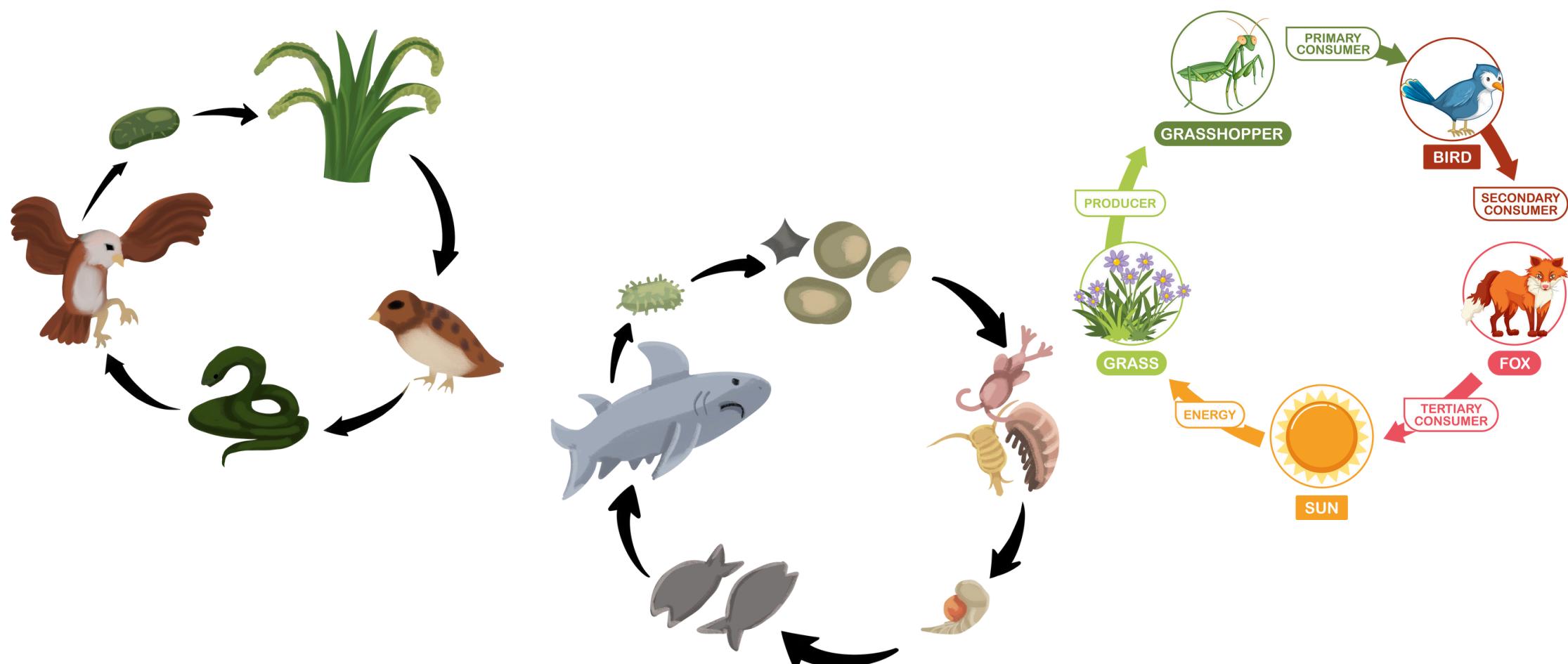
8. Describe how decomposers help keep the environment clean.

Decomposers break down dead plants and animals, recycling nutrients and preventing waste buildup.

9. Give an example of a food chain you might find in your local area.

Answers may vary.

Grass → Grasshopper → Bird → Cat



# Photosynthesis

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The different stages of Photosynthesis

1

## **LIGHT ABSORPTION**

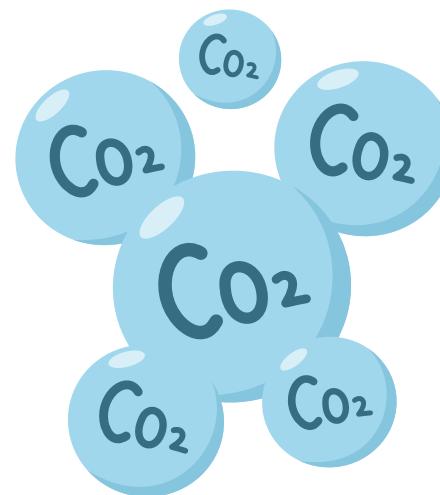
Plant leaves have a special substance called chlorophyll that helps capture the energy from sunlight and allows the plant to use this energy for making food



2

## **$\text{CO}_2$ UPTAKE**

Plants take in carbon dioxide from the air through tiny pores on their leaves called stomata, which allow the gas to enter for photosynthesis.



3

## **WATER UPTAKE**

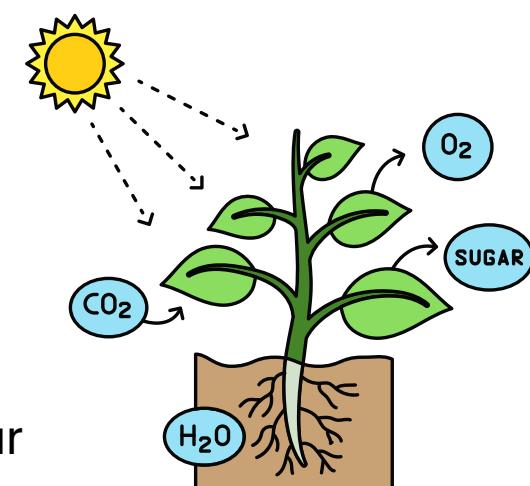
Plants use their roots to draw water up from the soil and then move this water to their leaves where it is needed for photosynthesis.



4

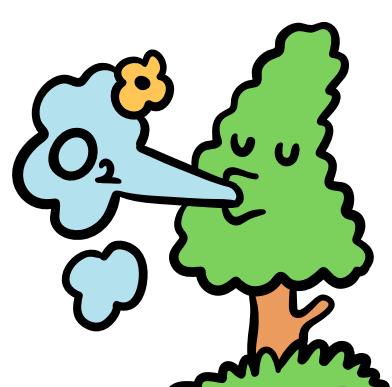
## **THE REACTION**

Inside the chloroplasts, plants use sunlight to change water and carbon dioxide into sugar (glucose) and oxygen.



5

## **GLUCOSE PRODUCTION AND OXYGEN RELEASE**



Photosynthesis creates glucose, which provides energy for the plant, and releases oxygen as a waste product through tiny pores called stomata. This oxygen then travels into the atmosphere, where it is vital for living organisms, including humans and animals, to breathe and survive.

## Photosynthesis

Upper Primary Advance Science

Answer the following questions.

1 What pigment in plant leaves absorbs sunlight during photosynthesis?

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2 Through what tiny openings on leaves do plants take in carbon dioxide?

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3 From where do plants absorb water to use in photosynthesis?

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4 In which part of the plant cell does photosynthesis occur?

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5 What are the two main substances that combine during photosynthesis to make glucose and oxygen?

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6 Why is photosynthesis important for both plants and humans?

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7 How do you think photosynthesis help to regulate the Earth's climate?

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8 What three things do plants need to perform photosynthesis?

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## Photosynthesis - Solutions

Upper Primary Advance Science

Answer the following questions.

1 What pigment in plant leaves absorbs sunlight during photosynthesis?

Chlorophyll.

2 Through what tiny openings on leaves do plants take in carbon dioxide?

Stomata.

3 From where do plants absorb water to use in photosynthesis?

From the soil through their roots.

4 In which part of the plant cell does photosynthesis occur?

In the chloroplasts.

5 What are the two main substances that combine during photosynthesis to make glucose and oxygen?

Water and carbon dioxide.

6 Why is photosynthesis important for both plants and humans?

It produces glucose for plants to use as energy and releases oxygen needed by humans and animals to breathe.

7 How do you think photosynthesis help to regulate the Earth's climate?

Photosynthesis takes in carbon dioxide, a greenhouse gas, helping to

reduce its amount in the atmosphere and it slows down climate change.

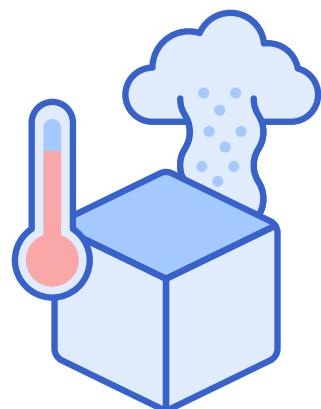
8 What three things do plants need to perform photosynthesis?

Sunlight, water, and carbon dioxide.

## State of Matter and Phase Changes

Upper Primary Advance Science

# Phase Changes



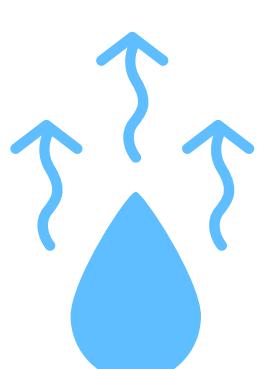
## Sublimation

Sublimation is the process in which a substance changes directly from the solid state to the gaseous state without passing through the liquid state.



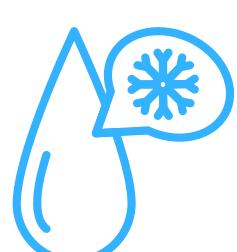
## Melting

Melting is the physical process in which a solid changes into a liquid when heat is applied. This occurs when the solid reaches a specific temperature known as the melting point, at which the particles gain enough energy to break free from their fixed positions and move more freely as a liquid.



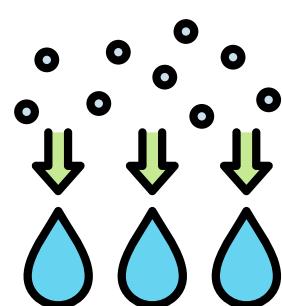
## Evaporation

Evaporation is the process by which a liquid changes into a gas or vapor at temperatures below its boiling point. This happens when molecules at the surface of the liquid gain enough energy to break free from the liquid and enter the air as gas.



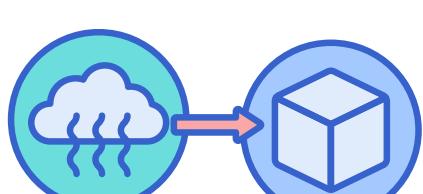
## Freezing

Freezing is the process in which a liquid changes into a solid when its temperature is lowered to a certain point called the freezing point. During freezing, the molecules in the liquid slow down and line up tightly together, forming a solid structure.



## Condensation

Condensation is the process where a gas (like water vapour) cools down and changes into a liquid. This happens when the gas loses heat and its particles slow down, coming closer together to form drops of liquid.



## Deposition

Deposition is the process when a gas turns directly into a solid, skipping the liquid stage.

## State of Matter and Phase Changes

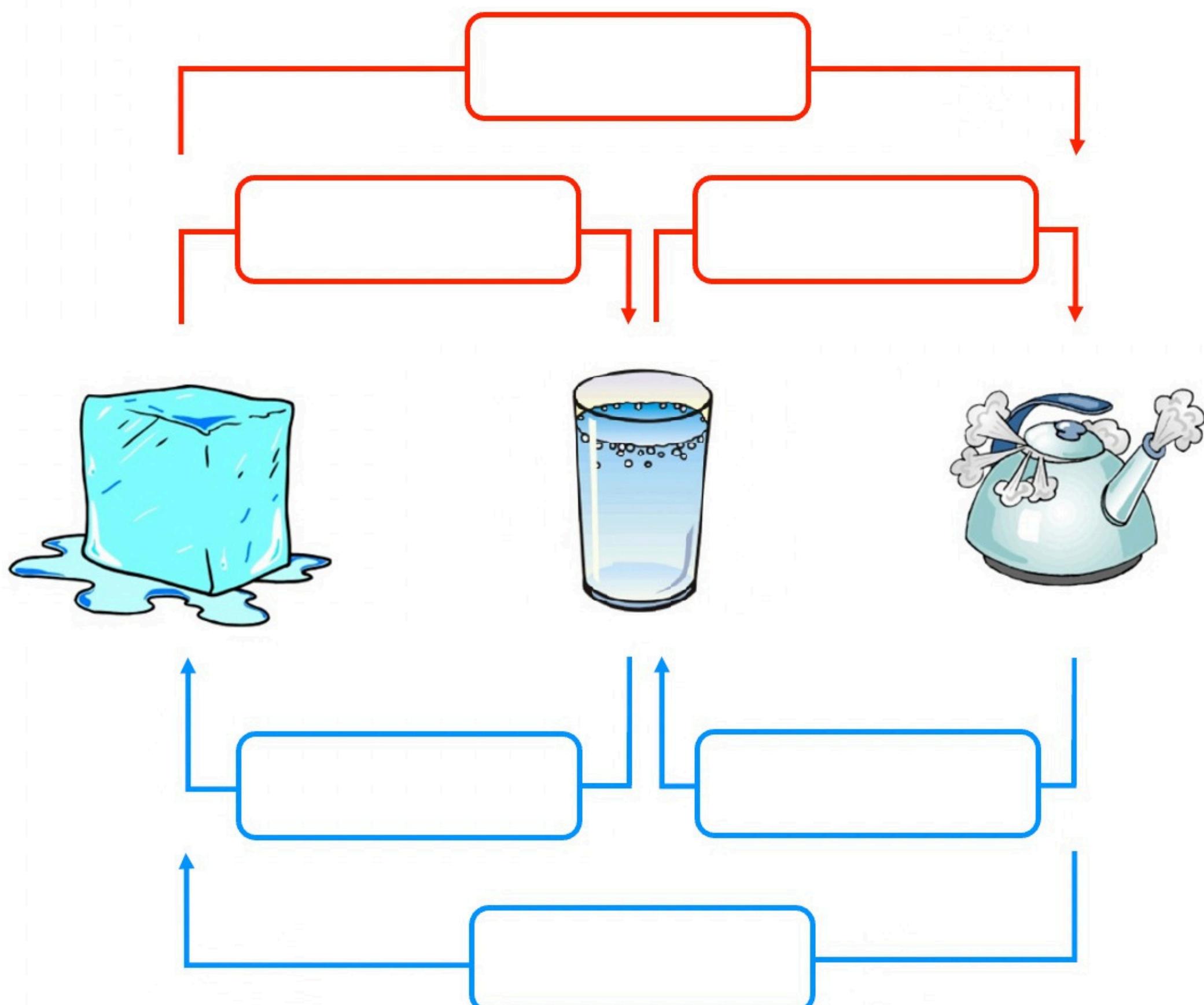
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Which of the following statements is incorrect?

- a) Particles in a solid vibrate but do not move from their fixed positions.
- b) Gas particles move randomly and are widely spaced from one another.
- c) The particles in a liquid move faster than those in a gas.
- d) Particles in a solid are closely packed and strongly attracted to each other.

Fill in the box with the correct processes using the helping words provided.

• Condensation	• Deposition	• Evaporation
• Melting	• Sublimation	• Freezing



Which state of matter has the weakest attractive forces between particles?

- a) Solid
- b) Liquid
- c) Gas

## State of Matter and Phase Changes

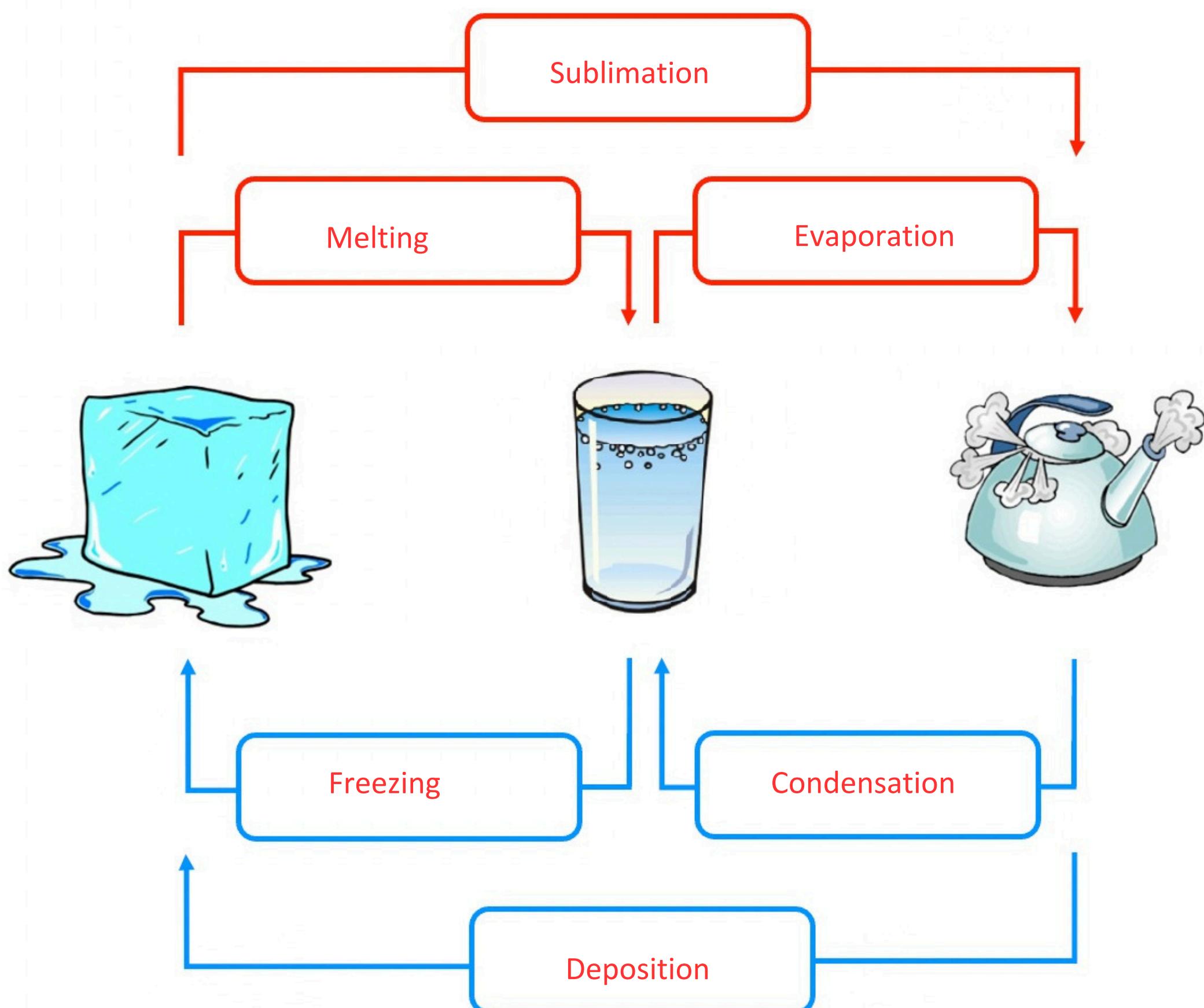
Upper Primary Advance Science

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Fill in the box with the correct processes using the helping words provided.

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Which state of matter has the weakest attractive forces between particles?

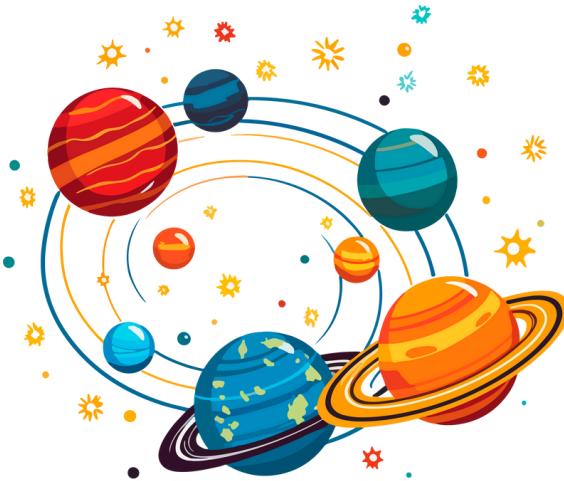
- a) Solid
- b) Liquid
- c) **Gas**

# Solar System Comprehension

Upper Primary Advance Science

## Our Solar System

Our solar system is made up of the Sun and everything that orbits around it. This includes eight planets, 146 known moons, dwarf planets, asteroids, comets, and countless smaller rocks and particles made of ice and dust. The Sun sits at the centre and provides the heat and light that make life possible on Earth.



The eight planets in order from the Sun are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Mercury is the smallest and closest planet to the Sun, while Neptune is the farthest. The four inner planets (Mercury, Venus, Earth, and Mars) are rocky, while the four outer planets (Jupiter, Saturn, Uranus, and Neptune) are mostly made of gas or ice.

Earth takes 365 days, or one year, to orbit the Sun. Other planets take longer or shorter times depending on how far they are from the Sun. Most planets follow orbits that are shaped like slightly stretched circles called ellipses. Many planets also have moons that orbit them. For example, Earth has one moon, while Jupiter has more than 90.

Astronomers are scientists who study space. They use telescopes, satellites, and space missions to learn more about planets, stars, and galaxies. Thanks to astronomers, we now know that our solar system is only one of billions in our galaxy, the Milky Way.

**Read the passage above and answer the questions that follow.**

1. What is at the centre of our solar system?
  - a) Earth
  - b) The Moon
  - c) The Sun
  - d) Jupiter
2. How many planets are in our solar system?
  - a) Seven
  - b) Eight
  - c) Nine
  - d) Ten
3. Which planet is farthest from the Sun?
  - a) Mars
  - b) Jupiter
  - c) Uranus
  - d) Neptune

## Solar System Comprehension

Upper Primary Advance Science

**Read the passage above and answer the questions that follow.**

4. What type of planets are Mercury, Venus, Earth, and Mars?

- a) Gas giants
- b) Ice planets
- c) Rocky planets
- d) Dwarf planets



5. What shape are most planetary orbits?

- a) Triangular
- b) Perfect circles
- c) Ellipses
- d) Spirals

6. How long does Earth take to orbit the Sun?

- a) 24 hours
- b) 30 days
- c) 365 days
- d) 12 hours

7. Which planet has more than 90 moons?

- a) Earth
- b) Mars
- c) Jupiter
- d) Mercury

8. What are astronomers?

- a) Scientists who study the human body
- b) Scientists who study space and celestial objects
- c) People who build rockets
- d) Weather experts

9. What galaxy contains our solar system?

- a) Andromeda
- b) Milky Way
- c) Whirlpool
- d) Sombrero

## Solar System Comprehension - Solutions

Upper Primary Advance Science

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## Solar System Comprehension - Solutions

Upper Primary Advance Science

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