

Unit 1 Life on Earth

WORD Study

Ⓐ

Biodiversity refers to a healthy number and quantity of species in an ecosystem.

This class will teach you why it is **vital** to protect wildlife habitats.

Scientists use **classification** to organize living things into smaller groups.

Scientists **sort** things into groups to show how they are alike and different.

What are some **characteristics** of plants?

Groupings enable students to be arranged into different sets of groups for each activity.

The car has some interesting new design **features**.

A great variety of plants and animals **thrive** in rainforests.

WORD Practice

Ⓑ



1. feature
2. vital
3. biodiversity
4. classification

Ⓒ

1. sorted
2. characteristics
3. groupings
4. vital
5. thrive

Comprehension CHECK-UP

Ⓓ

1. d
2. d
3. a
4. c
5. b

Visual Thinking

Ⓔ

Major Groupings	Characteristics
Animals	They get their food by eating <u>plants</u> or other animals.
Plants	They provide food and <u>oxygen</u> by using energy from <u>the Sun</u> .
Fungi	They need to absorb their food from their <u>surroundings</u> .
Bacteria	These <u>single-celled</u> organisms can survive in many habitats, including inside the human body.
Archaea	These single-celled organisms can survive in extremely <u>harsh</u> conditions.
Protista	These are organisms that do not really <u>fit into</u> any other group.

Summary

Ⓕ

- **Main Idea:** **Biodiversity** means the variety of living things in an area, and a **classification** system helps us understand it.
- **Details:**
 - Biodiversity occurs within the **same** species and among **different** species.
 - So far, more than 1.8 million kinds of living things have been **identified**.
 - The classification system has six groupings based on common **characteristics**, and each large group is **broken down** into smaller groups.

Unit 2 Sorted into Groups

WORD Study

Ⓐ

Each era is **subdivided** into a number of periods.

Seed plants bear seeds to reproduce.

Pines are the most common type of **conifers**.

The wood was **damp**, so it did not burn.

Girls **mature** earlier than boys both physically and mentally.

I dreamed of exploring **undiscovered** historic sites.

Not all animals have a **backbone**.

An earthworm has a **segmented** body.

WORD Practice

Ⓑ

1.  Wipe the wall clean by using a **damp** sponge.

2.  **Conifers** are cone-bearing seed plants.

3.  **Seed plant**s include not only flowering plants but also conifers.

4.  Animals without **backbone**s are called invertebrates.

Ⓒ

1. undiscovered
2. mature
3. subdivide
4. Conifer
5. segmented

Comprehension CHECK-UP

Ⓓ

1. c
2. b
3. b
4. b
5. d

Visual Thinking

Ⓔ

Seed Plants	Non-seed Plants
	
<ul style="list-style-type: none">- They contain the subgroups called flowering plants and conifers.- Within this group are the grasses, which have a vital role to play in environments around the world.	<ul style="list-style-type: none">- They include ferns and mosses.- They like to grow in damp, shady places.

Summary

Ⓕ

- **Main Idea:** **Plants** are divided into two groups, and **animals** are divided into nine main groups.
- **Details:**
 - Plants are **subdivided** into seed plants and non-seed plants.
 - Seed plants contain two groups of **flowering** plants and conifers while non-seed plants include **ferns** and mosses.
 - More than a million animal species are **classified** in nine groups, for example, animals with a **backbone**, with a soft body and a hard shell, and with a segmented outer skeleton.

Unit 3 Keeping the Balance

WORD Study

Ⓐ

Baby birds **depend** on their mother to feed them.
Plants' roots grow and **spread** to get more nutrients and water.
If a flower is not **pollinated**, it will not form seeds.
You need the right **balance** of diet and exercise to lose weight.
Rainforests are wet, and there is little sunlight.
You need to keep your pet and its **shelter** clean.
The lifeguard took a **risky** action to save the boy's life.
Crops can be destroyed when they are attacked by **pests**.

WORD Practice

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1. pollinate
2. pest
3. rainforest
4. spread

Ⓒ

1. pests
2. shelter
3. depend
4. balance
5. risky

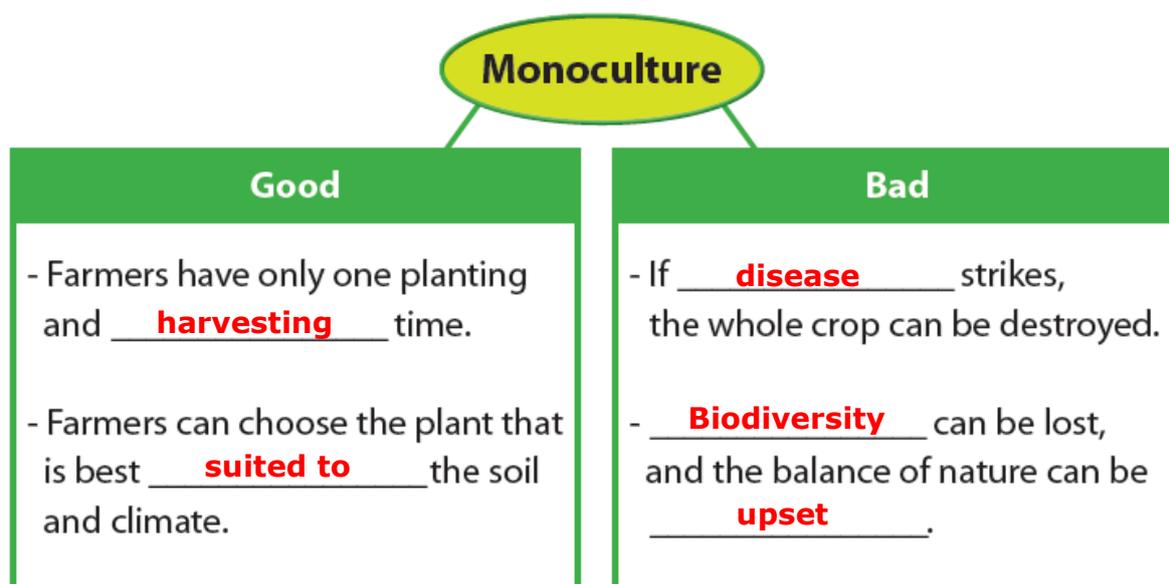
Comprehension CHECK-UP

Ⓓ

1. a
2. b
3. d
4. d
5. b

Visual Thinking

Ⓔ



Summary

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- **Main Idea:** **Biodiversity** brings balance to an ecosystem, but, when it is lost, the balance of nature can be **upset**.
- **Details:**
 - Animals need plants or other animals to eat. Some plants need animals to **spread** their seeds or to **pollinate** their flowers.
 - **Monoculture** is the opposite of biodiversity, and it can be very risky if disease strikes as the whole crop can be **destroyed**.

Unit 4 Helping and Harming

WORD Study

Ⓐ

All the populations of **organisms** live in a community.
Parents' first duty is the proper **protection** of their children.
There is an **interrelationship** between regular exercise and good health.
You can **enhance** the flavor of the dish with fresh herbs.
The plant was **introduced** to stop soil erosion in this place.
Insects help plants **reproduce** by pollinating them.
The city was in a **disastrous** situation because of the hurricane.
Introduced species often compete with **native** species for food.

WORD Practice

Ⓑ

1.		•	•	A life cycle includes many stages in an <u>organism</u> 's life.
2.		•	•	Half the city was destroyed by a <u>disastrous</u> flood.
3.		•	•	While roller-skating, you should wear knee pads for <u>protection</u> .
4.		•	•	Not all animals <u>reproduce</u> , or have young, in the same way.

Ⓒ

1. introduce
2. interrelationship
3. reproduce
4. enhance
5. native

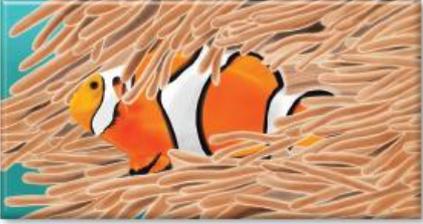
Comprehension CHECK-UP

Ⓓ

1. a
2. d
3. c
4. d
5. b

Visual Thinking

Ⓔ

Different Kinds of Species	Same Kinds of Species
 <p>Clownfish get <u>food</u> from sea anemones, and the sea anemones provide <u>protection</u> for the clownfish.</p>	 <p>Wolves <u>raise</u> their young together and <u>hunt</u> as a family.</p>

Summary

Ⓕ

- **Main Idea:** The interrelationships of species **enhance** biodiversity, but the **introduction** of new species can harm it.
- **Details:**
 - Animals of different species may have **relationships** with one another in which they get a meal, shelter, **protection**, or a free ride.
 - When animals or plants are **introduced** to a new place, they increase their members quickly, and they become a threat to the **native** species.

Unit 5 Protect and Preserve

WORD Study

Ⓐ

Emus could become **extinct** in the wild.
Recently, there has been a slight **reduction** in the price of oil.
The swamp was **drained** because of the long drought.
Technology has had an important **impact** on society.
Invasive species harm native plants and animals.
Police cars **patrol** the area outside the high school.
Wildlife has been affected by human behavior.
The **monoculture** farming of tea gave the soil no time to recover.

WORD Practice

Ⓑ



1. drained
2. Invasive
3. reduction
4. wildlife

Ⓒ

1. Monoculture
2. patrol
3. extinct
4. impact
5. wildlife

Comprehension CHECK-UP

Ⓓ

1. b
2. a, d
3. c
4. c
5. a, c

Visual Thinking

Ⓔ



Create a **wildlife habitat** of your own. Fill a flower box with plants that attract insects and birds.



Keep in mind that reduce, reuse, **recycle**, repair, and rethink. Then, you will become more aware of what you can do to reduce waste.



Get involved in **cleaning up** a local park or waterway which can be **home** to many plants and animals.

Summary

Ⓕ

- **Main Idea:** People harm **biodiversity** in many ways, but people try to help **protect** biodiversity and the balance of nature.
- **Details:**
 - Some species are reduced or become **extinct** due to the loss of their habitats.
 - Many forests are cleared, wetlands are **drained**, and grasslands are planted with crops.
 - In order to protect biodiversity, people farm **mixed farms** and leave patches of wilderness areas **untouched** on their farms.

Review 1

1. b
2. a
3. d

[Listening script]

The animal grouping is the largest and most diverse. There are more than a million species of animals. Many more remain undiscovered. Animals are found in the sea, on the land, and in the air. They can be divided into nine main groups, including animals with a backbone, animals with a soft body and a hard shell, and animals with a segmented outer skeleton.

4. c
5. d

6. *(Answers may vary.)*

The national park helps protect an area's biodiversity and maintain a healthy balance between species in that area.

7. *(Answers may vary.)*

Forests are cut down to build houses or to create farmland. This leads to loss of habitat and the extinction of species.

Unit 6 The Air Up There

WORD Study

Ⓐ

Air pressure is higher in cold areas than in warm areas.

You can use a scale to measure the **mass** of the cup and water.

We measure the items by weight, not by **volume**.

The number of natural disasters has **increased** in the past few years.

They cut a path through the **dense** jungle.

We used a pump to **inflate** the tires of our bikes.

The **airship** is taking off from the airport.

The store sells laptops, mobile phones, and other electronic **devices**.

WORD Practice

Ⓑ

1.			The forest is <u> dense </u> with a variety of trees and plants.
2.			You can <u> inflate </u> your life jacket by pulling on the cord.
3.			The <u> airship </u> is flying high over the town.
4.			New electronic <u> device </u> s quickly replace old ones these days.

Note: Red lines connect the images to the correct words in the sentences: 1 to 4, 2 to 3, 3 to 1, and 4 to 2.

Ⓒ

1. air pressure
2. mass
3. increase
4. volume
5. dense

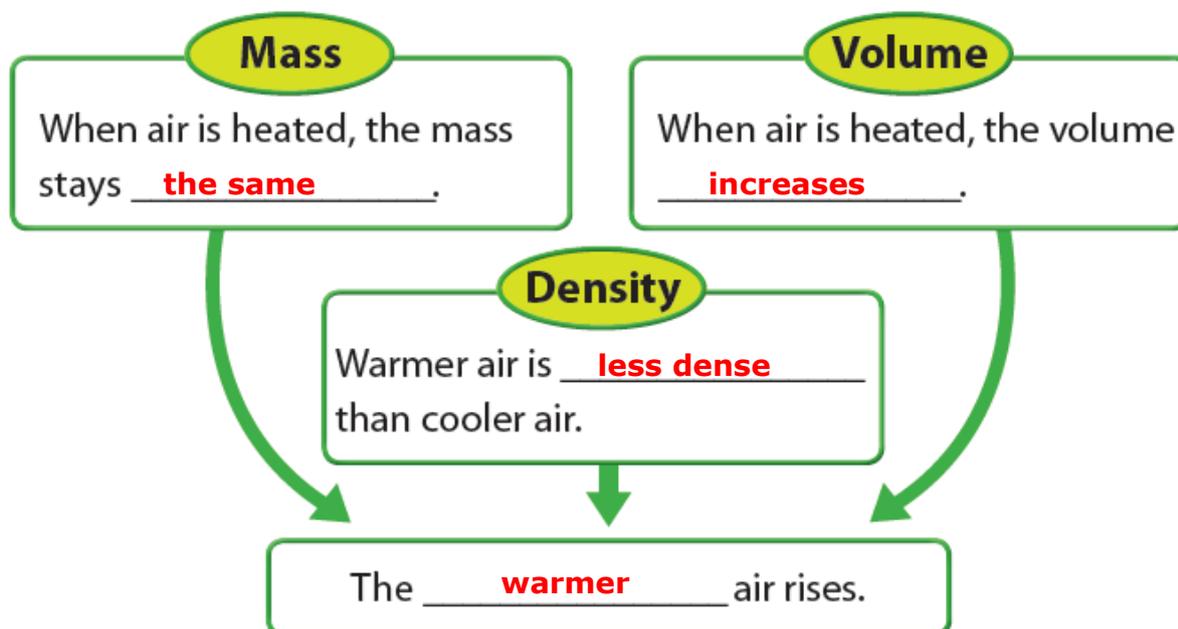
Comprehension CHECK-UP

Ⓓ

1. b
2. d
3. c
4. a
5. c

Visual Thinking

Ⓔ



Summary

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- **Main Idea:** The **properties** of air make flight possible, and lighter-than-air gases make it possible to fly.
- **Details:**
 - The properties of air are **pressure, mass, and volume**.
 - When heated, the mass of air stays the same, but the volume **increases**, and the air is less **dense**.
 - When the air in a **hot-air balloon** is heated, it becomes less dense and makes it fly.

Unit 7 Up, Up, and Away

WORD Study

Ⓐ

Air can **exert** pressure or weight.

The population of that animal is steadily **decreasing**.

She **lifted** her baby up onto her lap.

Gravity pulls everything toward the center of the Earth.

Airfoils are found in airplanes, propellers, fans, and turbines.

The dog has long and **curved** ears.

If you have allergies, they can limit the **airflow** through your nose.

There is a 30-degree **angle** between the two lines.

WORD Practice

Ⓑ



1. curved
2. gravity
3. lift
4. airfoil

Ⓒ

1. lift
2. decreases
3. curved
4. angle
5. exerts

Comprehension CHECK-UP

Ⓓ

1. b
2. a, d
3. b
4. c
5. b, c

Visual Thinking

Ⓔ

The air above an object moves **faster** than the air below the object.



The **fast-moving** air has lower pressure than slow-moving air.



The air above an object has **lower pressure** than the air below, and there is a **lifting force** .



When the lifting force is stronger than the force of **gravity** , the object **rises** .

Summary

Ⓕ

- **Main Idea:** Fast-moving air helps an object **lift off**, and the shape and the **angle** of the wing can affect lift.
- **Details:**
 - When air moves quickly through an area, it creates **low pressure** in that area, so, if the air above it is at a **higher pressure**, there is an upward force.
 - When **lift** is stronger than gravity, the object will rise.
 - The **airfoil** shape and the increased angle of **attack** can increase lift.

Unit 8 Pushing Ahead

WORD Study

Ⓐ

I **overcame** my fear of heights.

The design of aircraft wings reduces **drag**.

These tight pants reduce wind **resistance**.

Submarines have **streamlined** bodies to deal more easily with water resistance.

When you launched your rocket, the path it took depended on how much **thrust** you put behind it.

Different **propeller** designs of wind turbines produce more power.

The liquid **expands** at high temperatures.

Many automobiles produce **exhaust** fumes.

WORD Practice

Ⓑ

1.			The <u>propeller</u> moves the plane forward.
2.			Car <u>exhaust</u> and smoke from factories cause land pollution.
3.			<u>Thrust</u> is used to overcome the drag of an airplane.
4.			A shark has <u>streamlined</u> fins that allow it to turn its body fast.

Ⓒ

1. overcome
2. Drag
3. resistance
4. expand
5. propeller

Comprehension CHECK-UP

Ⓓ

1. c
2. a
3. b
4. b
5. d

Visual Thinking

Ⓔ



- They are **spinning blades** constructed in the shape of an airfoil and angled so that the lift they produce turns into **thrust**.



- They burn compressed air and fuel to produce **hot gases** which push against the engine and then rush out the **exhaust** at the rear.

Summary

Ⓕ

- **Main Idea:** **Drag** acts to slow down things that fly, and **thrust** is the force that makes flying devices move forward.
- **Details:**
 - Drag **opposes** the forward motion of an object and slows it down when the object moves through **fluids**.
 - Thrust is the propulsion force that **overcomes** drag and **permits** forward motion.
 - Airplanes use propellers or **jet engines** to provide **thrust**.

Unit 9 Soaring and Gliding

WORD Study

Ⓐ

The released energy helps to **propel** the space shuttle.

Things fly because the **propulsion** is greater than the force of drag and gravity.

The Earth's oceans help **maintain** its average temperature.

All organisms **rely on** other organisms.

Temperature differences can cause **air current**.

I **released** a helium balloon, and it flew away.

I gave a box with a **hinged** cover to my grandmother.

Aircraft flight **control surfaces** allow a pilot to control the aircraft's altitude.

WORD Practice

Ⓑ



ordok current mecu propel cam surface moth rely ra

1. rely
2. surface
3. propel
4. current

Ⓒ

1. maintain
2. hinged
3. propulsion
4. propel
5. released

Comprehension CHECK-UP

Ⓓ

1. d
2. d
3. b
4. a
5. b

Visual Thinking

Ⓔ

Airplanes	Gliders
 <ul style="list-style-type: none">- They are heavier -than-air aircraft and rely on power from their engines.- As long as they have propulsion, they can maintain flight.	 <ul style="list-style-type: none">- They are lighter -than-air aircraft and rely on air currents to keep them aloft.- An airplane has to tow a glider into the sky and then release it.

Summary

Ⓕ

- **Main Idea:** There are some **differences** between airplanes and gliders, and a pilot can control the four forces acting on an airplane during flight.
- **Details:**
 - Airplanes rely on power from their **engines** to propel them forward, but gliders rely on air **currents** to keep them aloft.
 - A pilot can control the movements of an airplane by using its **hinged** parts.
 - The control **surfaces** affect the motion of the airplane by changing the way the air **flows** around it

Unit 10 Flying at a Price

WORD Study

Ⓐ

Many people **long** to live longer and healthier.

A van at the hotel **transports** guests to and from the airport.

The workers unloaded **cargo** from the ship onto the dock.

They take their grandparents to a hospital for **medical** checkups.

Some people in the building passed out from breathing the toxic **fumes**.

The polar ice caps are melting due to **global warming**.

Some places **suffer from** floods at this time of the year.

Symptoms of the flu include a fever, sore throat, and coughing.

WORD Practice

Ⓑ

1.  _____ **Fume** _____ s from cars and aircraft pollute the air.

2.  The trains are able to hold more _____ **cargo** _____.

3.  The little girl is _____ **suffering** _____ from a hurt knee after falling from her bike.

4.  The bus _____ **transports** _____ many students to school every day.

Ⓒ

1. symptom
2. medical
3. fume
4. long
5. global warming

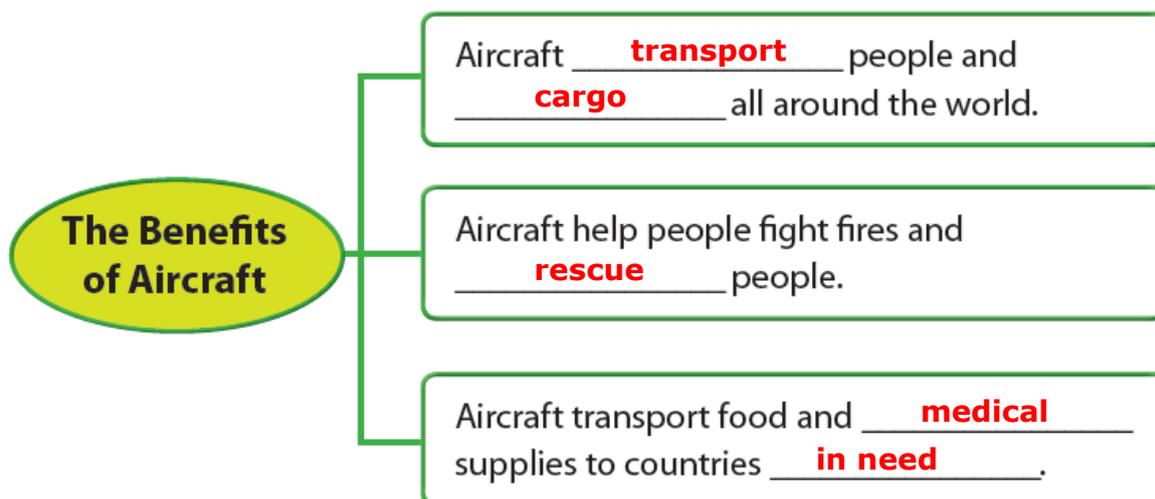
Comprehension CHECK-UP

Ⓓ

1. d
2. a
3. b
4. d
5. b

Visual Thinking

Ⓔ



Summary

Ⓕ

- **Main Idea:** Aircraft **benefit** society in many ways but also **harm** our environment.
- **Details:**
 - Aircraft are the **fastest** and most practical way to transport people, cargo, and medical supplies, to carry mail, and to rescue people.
 - Aircraft **release** greenhouse gases, which contribute to global warming.
 - People who live near airports suffer from health problems caused by the increased noise and air **pollution**.

Review 2

1. b
2. a
3. d

[Listening script] Drag is a force that needs to be overcome in order for something to fly. It opposes the forward motion of an object and tries to slow it down. Solid objects experience drag when they move through fluids, such as air or water. The force that overcomes drag and permits forward motion is called thrust. Animals that fly, such as birds, flap their wings to provide this thrust.

4. c
5. b

6. *(Answers may vary.)*

Airplane wings have an airfoil shape that is a curved upper surface and a flat bottom surface.

7. *(Answers may vary.)* Airplanes release greenhouse gases that contribute to global warming.

Unit 11 Our Solar System

WORD Study

Ⓐ

Many kinds of **nuclear reactions** occur in response to the absorption of particles.

The Moon **orbits** Earth, and Earth orbits the Sun.

Eight planets **revolve** around the Sun.

Many **asteroids** are found between Mars and Jupiter.

Earth is approximately 4 times bigger in **diameter** than the Moon.

A **meteoroid** is significantly smaller than an asteroid.

A **speck** of dust settled behind my right ear.

A **comet** generally has two tails, not one.

WORD Practice

Ⓑ



1. nuclear
2. asteroid
3. revolve
4. orbit

Ⓒ

1. asteroids
2. diameter
3. meteoroid
4. comets
5. a speck of

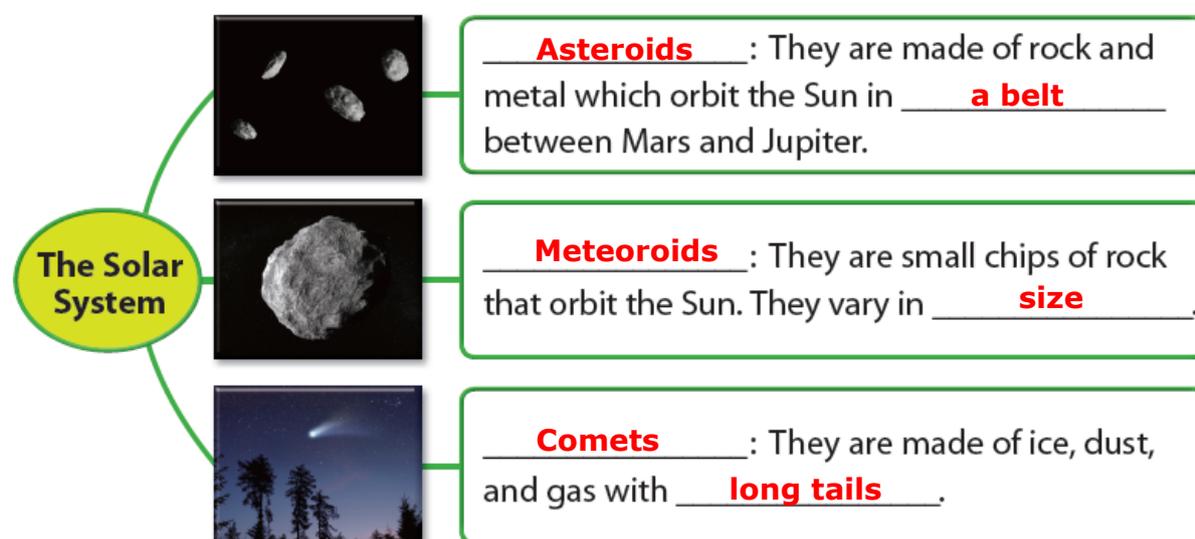
Comprehension CHECK-UP

Ⓓ

1. c
2. b
3. d
4. a
5. b

Visual Thinking

Ⓔ



Summary

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- **Main Idea:** There are the Sun, the eight planets, their moons, asteroids, meteoroids, and comets in the **solar system**.
- **Details:**
 - The Sun is at the center of the solar system, and the eight planets **orbit** the Sun.
 - **Asteroids** are bodies of rock and metal that form a belt between Mars and Jupiter, and **meteoroids** are small chips of rock.
 - **Comets** are small bodies of ice, dust, and gas with long tails.

Unit 12 Sun and Moon

WORD Study

Ⓐ

The price of diamonds is **relatively** high because they are rare.

Jupiter has the most **satellites**, at more than 60, in the solar system.

The Moon cannot **give out** its own light whereas the Sun can.

Both Jupiter and Venus shone brightly above us in the **cloudless** night sky.

It is difficult to see any **obvious** differences between the twins.

My sister wants to use the computer to **create** art.

Tides are used to generate electricity in some regions.

Water and air are **essential** for living things on Earth.

WORD Practice

Ⓑ

1.			Jupiter has the most <u>satellite</u> s in the solar system.
2.			The Sun <u>give</u> s out its own heat and light.
3.			Under a <u>cloudless</u> sky, the construction workers work very hard.
4.			We can predict when it will be high or low <u>tide</u> .

Ⓒ

1. tide
2. relatively
3. obvious
4. create
5. essential

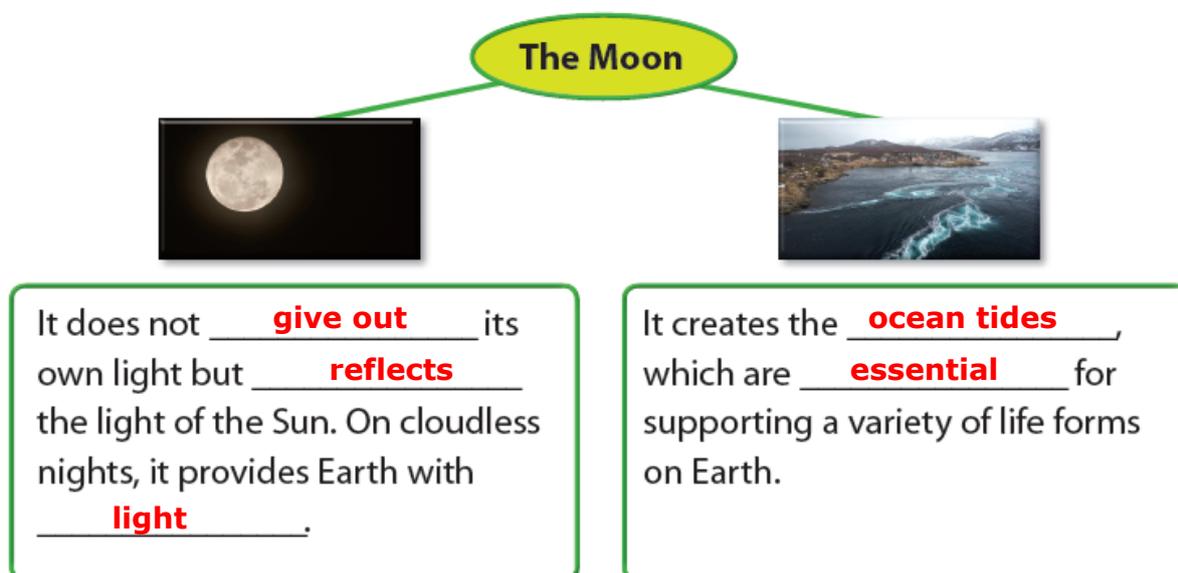
Comprehension CHECK-UP

Ⓓ

1. b
2. b
3. a
4. c
5. b

Visual Thinking

Ⓔ



Summary

Ⓕ

- **Main Idea:** The Sun is the source of energy for the **planets**, and the Moon is the only natural **satellite** of Earth.
- **Details:**
 - The Sun provides Earth with all of the **heat** and **light** it needs to grow food and to keep us warm.
 - The Moon creates the ocean **tides** on Earth.

Unit 13 Scanning the Skies

WORD Study

Ⓐ

People can use a **telescope** to observe the Moon.

All the passengers' bags are **scanned** at the airport.

My view of the distant mountains was **blurred** by the fog.

Astronomers look into the universe for new stars.

Space **probes** require less energy to operate because they don't need to support astronauts.

NASA sent a **rover** to Mars to take some soil samples.

A robotic arm helps the **astronaut** move around the outside of spaceship.

Uncrewed vehicles are a safe way to explore distant planets without using people.

WORD Practice

Ⓑ



1. scan
2. telescope
3. Astronomer
4. Astronaut

Ⓒ

1. scan
2. blur
3. probe
4. rover
5. uncrewed

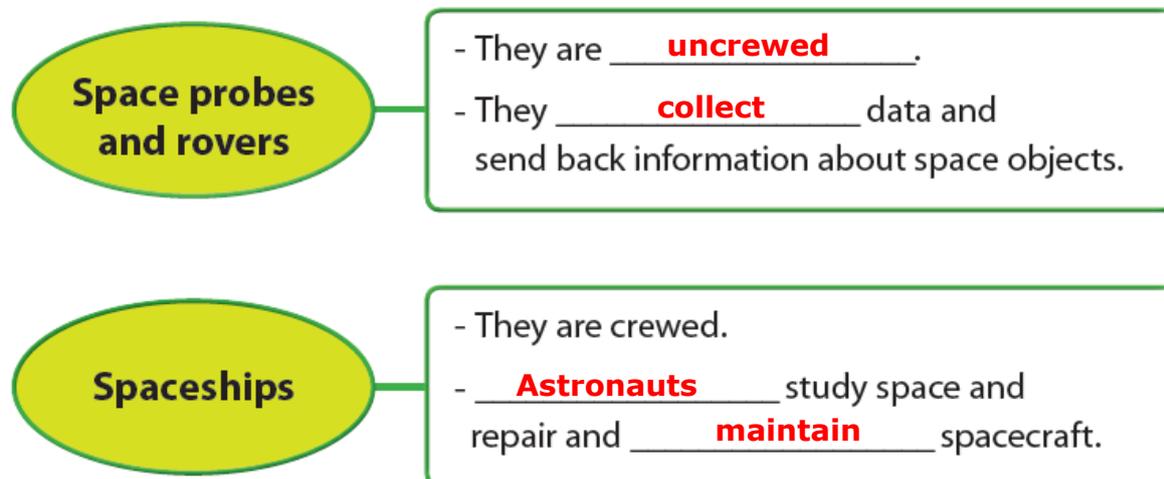
Comprehension CHECK-UP

Ⓓ

1. d
2. c
3. b
4. d
5. a, d

Visual Thinking

Ⓔ



Summary

Ⓕ

- **Main Idea:** Telescopes and other **inventions** help us **explore** space.
- **Details:**
 - Traditional **telescopes** gather far more light than the human eye can and allow us to see faraway **objects** clearly.
 - **Orbiting** telescopes above Earth give clearer images of space.
 - Robotic **probes**, rovers, and **crewed** spaceships sent to space can answer many questions about space.

Unit 14 Into the Unknown

WORD Study

Ⓐ

The rocket will **blast off** tomorrow morning.

These new viruses can spread quickly and cause **unknown** diseases.

People in deserts have found several ways to live in their **extreme** climates.

The longer astronauts stay in **microgravity**, the more their bones and muscles weaken.

Spacesuits allow astronauts to work safely in outer space.

It will be much easier to lift the sofa if everyone **cooperates**.

Students did simple **experiments** with magnets and irons.

The food contains no **artificial** colors or flavors.

WORD Practice

Ⓑ

1.		●	●	Since she lost her leg in an accident, she wears an <u>artificial</u> limb.
2.		●	●	<u>Spacesuit</u> s allow astronauts to work outside their space vehicles.
3.		●	●	The spaceship will <u>blast off</u> and go into outer space.
4.		●	●	They are in the lab for a chemical <u>experiment</u> .

Ⓒ

1. unknown
2. extreme
3. microgravity
4. cooperate
5. experiment

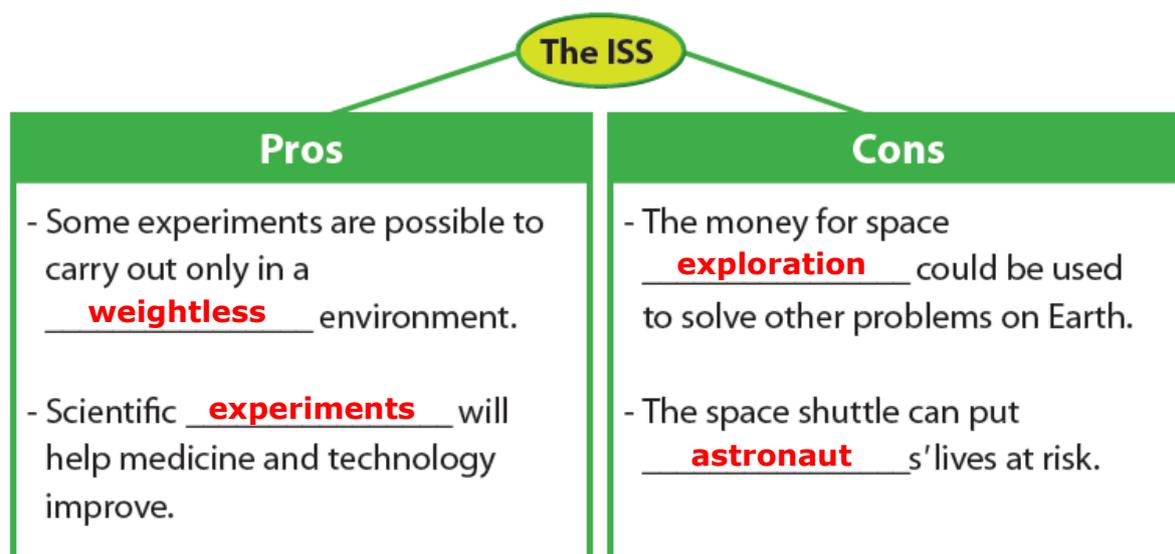
Comprehension CHECK-UP

Ⓓ

1. d
2. b
3. c
4. c
5. b

Visual Thinking

Ⓔ



Summary

Ⓕ

- **Main Idea:** Due to the harsh environment of space, astronauts need a special **life-support** system to survive, and the ISS is very important but **risky** for astronauts.
- **Details:**
 - In space, there is no air, and temperatures are **extreme**.
 - The Sun's rays and space rocks also threaten **astronauts**.
 - Astronauts must get used to the feeling of **microgravity**.
 - On the ISS, many kinds of **experiments** are conducted.

Unit 15 Space Spinoffs

WORD Study

Ⓐ

A test satellite was **launched** from the Kennedy Space Center.
Mom bought some dishes that can **withstand** high temperatures.
There are some pieces of electronic **equipment** in the laboratory.
Firefighters wear special clothes made of **fire-resistant** materials.
Technology allows us to do things more quickly and efficiently.
The man took vitamins to **improve** his health.
Computer technologies are becoming more **sophisticated** all the time.
Space debris is the biggest threat to astronauts and spacecraft.

WORD Practice

Ⓑ



1. Sophisticated
2. Technology
3. launch
4. debris

Ⓒ

1. withstand
2. improved
3. equipment
4. technology
5. Fire-resistant

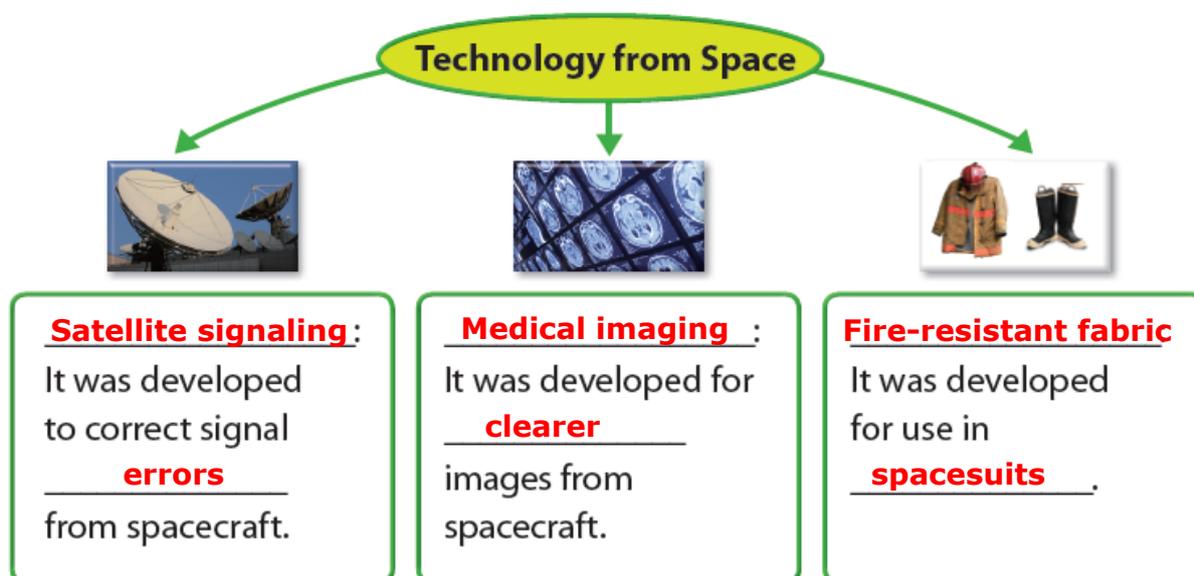
Comprehension CHECK-UP

Ⓓ

1. d
2. a, b
3. d
4. c
5. d

Visual Thinking

Ⓔ



Summary

Ⓕ

- **Main Idea:** Space **technology** has improved life on Earth, but **space junk** is dangerous.
- **Details:**
 - Space technology has **developed** many tools and technologies, such as **satellite** signaling, medical imaging, and the invention of fire-resistant fabrics and special plastics.
 - Space **debris** does not break down without air, so it is a real **danger** to astronauts working in space.

Review 3

1. b
2. a
3. c

[Listening script] The International Space Station (ISS) is a giant, orbiting science lab above Earth. Many countries are cooperating to build the ISS. Biological experiments conducted there can help humans fight disease on Earth. The same technology that is used for fuel pumps on the ISS is used to make improved artificial hearts for people who might otherwise die. But building the ISS is expensive, and risky for astronauts.

4. c
5. d

6. *(Answers may vary.)*

Astronauts are trained to get used to a feeling of weightlessness.

7. *(Answers may vary.)*

In a belt between Mars and Jupiter, most asteroids orbit the Sun.