



مؤسسة الإمارات للتعليم المدرسي  
EMIRATES SCHOOLS ESTABLISHMENT



United Arab Emirates

# End of term 3 Exam preparation

Science Grade 4  
Al Sumow School  
2023-2024

Created by Miss Zahra Salahuddien.  
Contains images and questions from Inspire Platform

# Structure of Exam

Number of MCQ عدد الأسئلة الموضوعية	15	Multiple choice 4 marks each question
Marks of MCQ درجة الأسئلة الموضوعية	60	
Number of FRQ عدد الأسئلة المقالية	5	<u>Written</u> answer 8 marks each question
Marks per FRQ الدرجات للأسئلة المقالية	40	

## VOCABULARY

Look for these words as you read:

adaptation

response

stimulus

transpiration

tropism

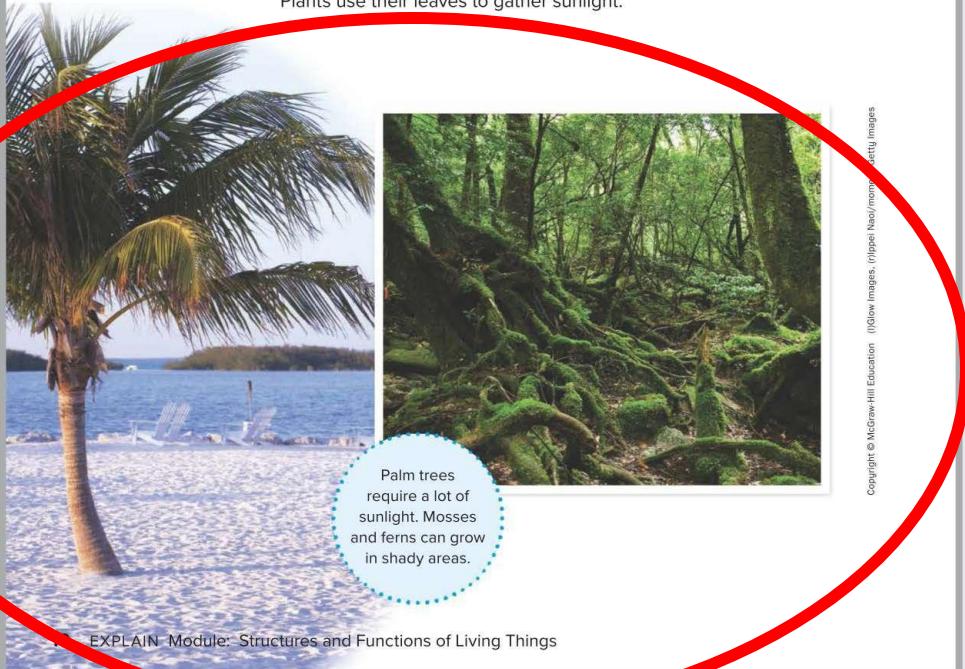
## Plant Needs

The redwood trees that you saw in the lesson phenomenon and the two schoolyard plants you observed in the Inquiry Activity, *Plant Parts*, probably look very different. But they aren't as different as you might think. All plants have the same basic needs and a set of typical structures.

The basic needs of plants are air, water, sunlight, nutrients, and space. Plants must live in an environment where their needs are met.

The air around Earth is a mixture of gases. Plants need one of these gases, carbon dioxide, to make food. They need another gas, oxygen, to break down the food. Plants have pores, or stomata, in their leaves that allow gases to move in and out of the plant.

Plants use sunlight to make food. They use the energy from sunlight to make sugar. The sugar provides the energy plants need to survive. Some plants need more sunlight than others. Plants use their leaves to gather sunlight.

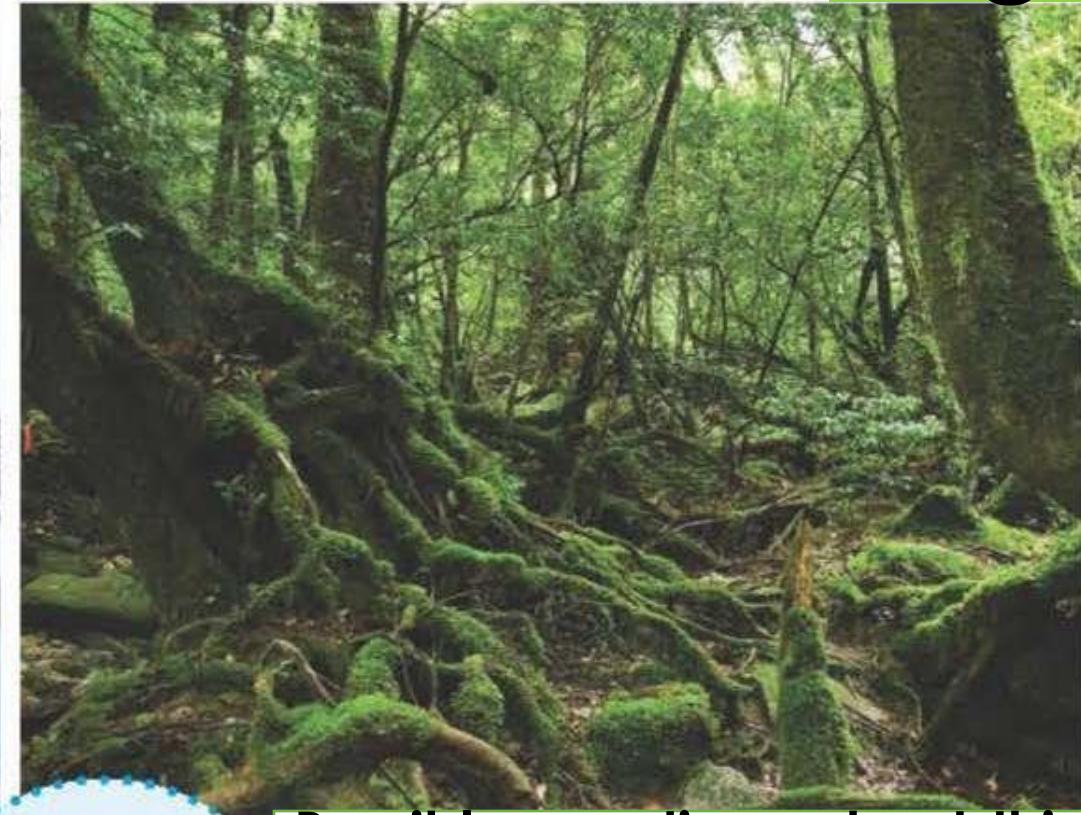
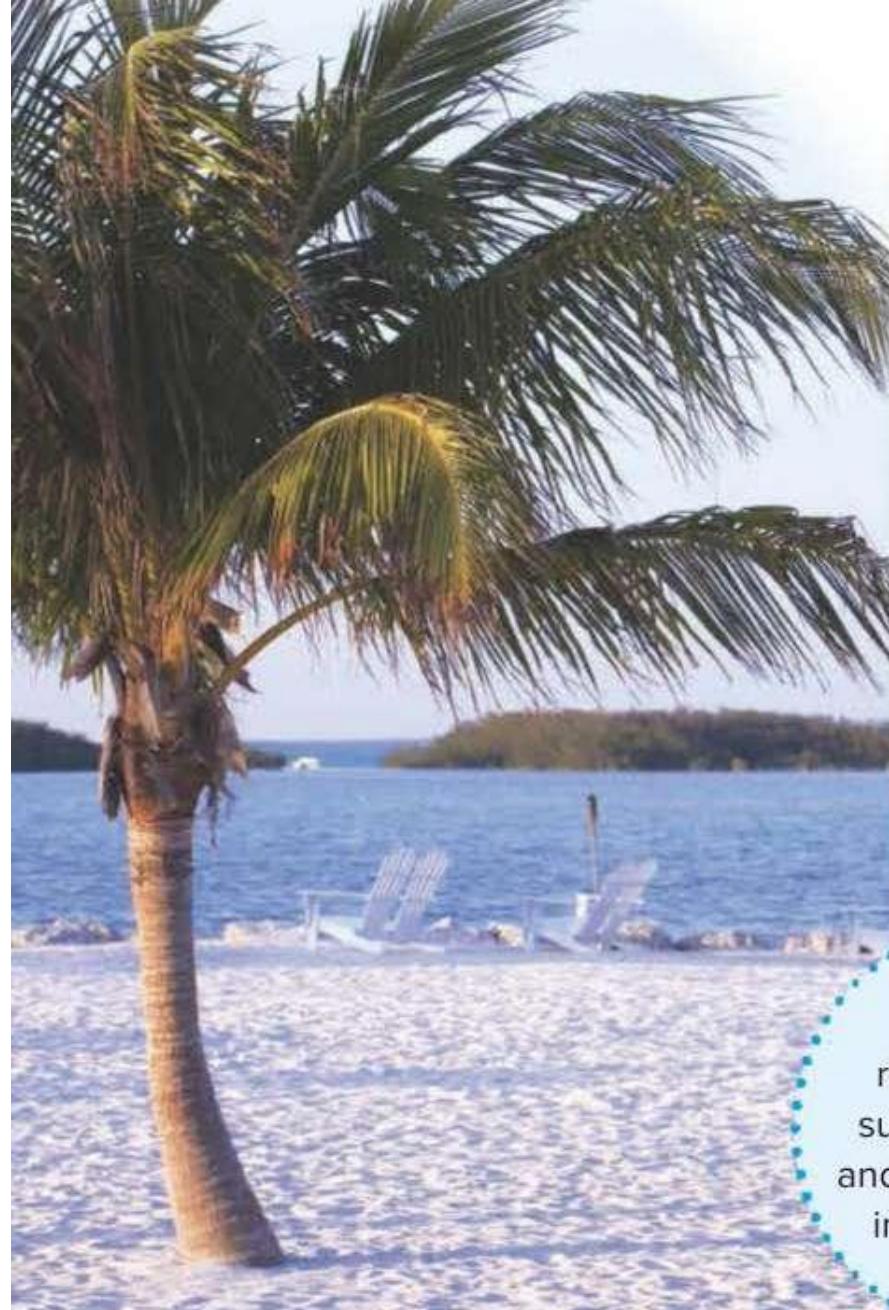


Question 1, Question 12  
and Question 13(figure)  
U4M1L1 page 10

4-LS1-1 Students will construct an argument to explain how plants use their structures to survive, grow and reproduce.

# Key Concepts from page 10

- What are 5 basic plant needs?
- air, sunlight, water, nutrients, space
- How does gas move in and out of plants?
- Through tiny openings in the leaves called stomata.
- What gases do plants use and what do they do with it?
- Carbon dioxide gas to make food and oxygen gas to break down food
- How do plants use Sunlight?
- To make food, sugars
- What part of the plant gathers the most sunlight?
- In their leaves
- What do plants use to make food?
- Water, carbon dioxide and sunlight.



Palm trees require a lot of sunlight. Mosses and ferns can grow in shady areas.

**Possible questions about this picture:**

What plant needs more light?  
**Palm tree**

What plants can grow in shady areas?  
**Mosses and ferns**

### Seeds

A seed contains an embryo surrounded by a food supply, or cotyledon, and an outer seed coat. An embryo is the beginning of a new organism. It will live off of the food supply until it is big enough to make its own food.

### Fruits

As a seed develops, the ovary enlarges into a fruit, which protects the seed. Some fruits appeal to animals, which eat the fruits and spread the plant's seed in their droppings.



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Use evidence to construct an argument that a plant's system has parts that work together to support reproduction.

**Sample answer:** An embryo is needed for reproduction. The embryo gets food from the seed and is protected by the seed coat.



Revisit the Page Keeley Science Probe on page 5.

# Question 2 and Question 5

## U4M1L1 page 15

**4-LS1-1 Students will construct an argument to explain how plants use their structures to survive, grow and reproduce.**

# Key Concepts from page 15

- How do seeds form?
- The pollen and egg cells join together in the ovary and this is called fertilization.
- What moves pollen?
- Insects, birds and the wind move pollen
- What are the parts of the seed?
- Seed coat, cotyledon and embryo
- Which part of the seed is the food source?
- cotelydon
- Which part of the seed will grow into a new plant?
- Embryo
- What protects the seed?
- Fruits develop around the ovary and protect the seed
- Why do plants need animals?
- To scatter their seeds



Plants rely on animals to scatter their seeds.



Use evidence to construct an argument that a plant's system has parts that work together to support reproduction.

Sample answer: An embryo is needed for reproduction. The embryo gets food from the seed and is protected by the seed coat.

# Question3 and Question 15

## U4M1L2 page 33

**Structures**  
Structures inside and outside animals' bodies work together to obtain nutrients, digest food, eliminate waste, and reproduce. These parts keep an animal alive and help it reproduce.

**Internal structures** are structures found inside an organism's body. These structures, like the major organs, have specific functions. For example, the brain's main function is to process information. The stomach helps digest food. The intestines absorb nutrients. Kidneys help eliminate waste. Lungs help with the exchange of gases. Animals can reproduce once their reproductive organs reach maturity.

**External structures** are found outside of an organism's body. A shark's teeth and a bird's beak are examples of external structures that help these animals get food.

2. **WRITING Connection** Revisit the Explore activity. Research the two different animals that you compared, focusing on their internal structures this time. Write a short summary explaining how these structures help each animal survive its environment. Use a separate piece of paper if needed.

**Sample answer:** Both mountain lions and lizards have many organs in common such as a brain to help process information, intestines to absorb nutrients, and kidneys to eliminate waste from their system.

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**GO ONLINE** Watch the video *Animal Structures* to learn more about animal structures.



Orangutans move by swinging from tree to tree. They need plenty of space to find shelter and food.



Robins build nests that are high off the ground so that they can safely lay eggs and raise their young.



Fish take in oxygen from the water through their gills.

EXPLAIN Lesson 2 Structures and Functions of Animals 33

4-LS1-1 Students will construct an argument to explain how animals use their structures to survive, grow, and reproduce.

# Key Concepts from page 33

- What structures are found inside the body?
- Internal structures
- Give examples of internal structures and their functions
- Brain --- process information      -lungs---exchange gases, stomach--- digest food , intestines-----absorb nutrients, kidneys--- eliminate waste.
- Which structures are found outside the body?
- External structures
- Name some external structures and their uses.
- Claws, wings, fur, scales, teeth, beak.



Orangutans move by swinging from tree to tree. They need plenty of space to find shelter and food.



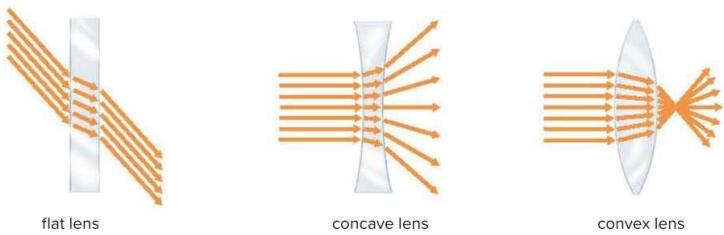
Robins build nests that are high off the ground so that they can safely lay eggs and raise their young.



Fish take in oxygen from the water through their gills.

**Refraction** is the bending of a light wave as it changes angles passing from one substance into another. Light slows down when it moves from one material to a denser material. This decrease in speed causes the light's angle to change, or its direction to bend.

A clear piece of glass or plastic through which light travels is called a lens. If the lens is flat, the light's path shifts a little, but its final direction does not change. A lens that is thinner in the middle is a **concave lens**. Light that passes through a concave lens spreads outward. A lens that is thicker in the middle is a **convex lens**. Light that passes through a convex lens will come together at a focus point. The image you see when you look at an object through a convex lens depends on how far away the object is. Up close, the lens will cause the object to look bigger. Far away, the image will appear upside-down and smaller.



2. What is the difference between refraction and reflection?

**Sample answer:** Refraction is bending of light as it passes from one material to another. Reflection is when light hits a surface and bounces off.

Concave lenses are used in eyeglasses for people who are nearsighted, or have trouble seeing objects that are far away. Convex lenses are needed for people who are farsighted, or have trouble seeing objects that are up close.



#### Talk About It

Discuss with a partner. What is the difference between a concave lens and a convex lens?

# Question 4

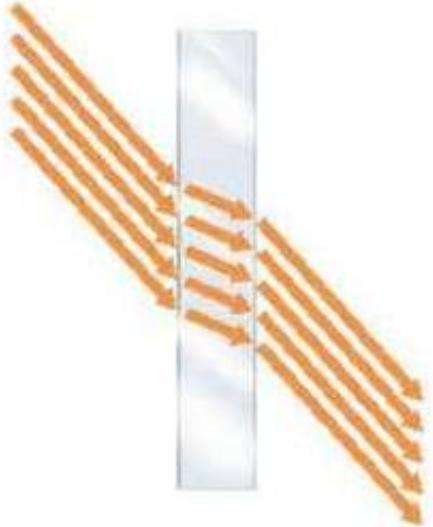
## U4M2L2 page 79

- 4-PS4-2 Student will develop and use a model to explain how light reflecting from objects allows animal's eyes to see.

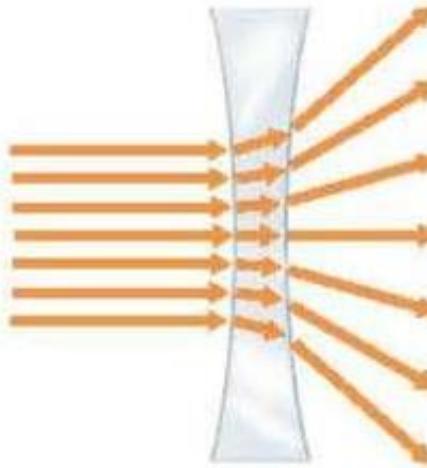
# Key Concepts from page 79

- What is reflection?
- Bouncing of light off a surface as it hits it.
- What is refraction?
- Bending of light as it passes from one substance to another
- Why does light bend?
- Because it slows down as it moves to a more dense material and the angle it is travelling at changes.
- What is a lens?
- A clear glass light travels through
- What image will you see if you look in a convex lens?
- Up close it will look bigger
- Far away it will look smaller or upside down

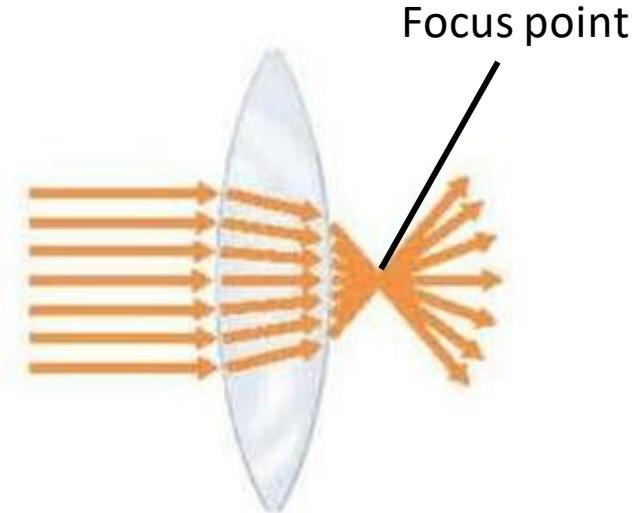
# Key Concepts from page 79



flat lens



concave lens



convex lens

Flat and  
light passes  
through

Thinner in  
the middle  
and light  
bends out

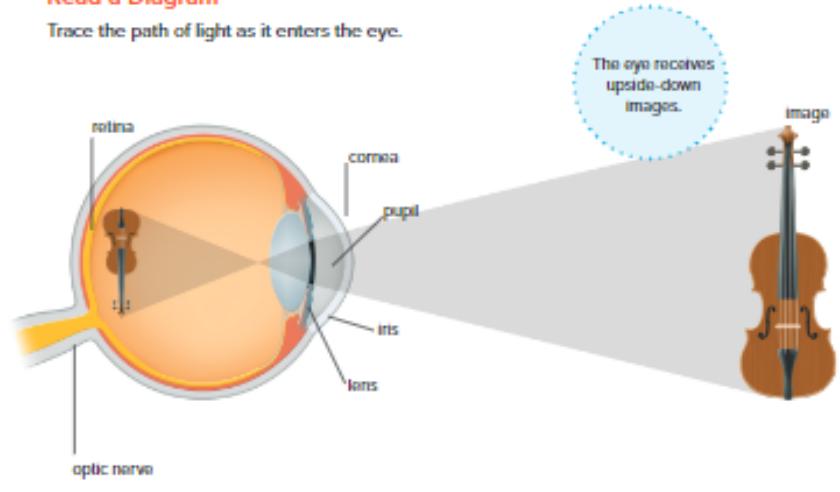
Thicker in  
the middle  
and light  
comes  
together

## The Human Eye

You see an image when light reflects off an object and enters your eye. The diagram shows the different parts of the eye that light passes through. Light passes through the cornea and the pupil in your iris. The lens refracts the light so that it hits the retina on the back of the eye. The retina sends signals to the brain, and the brain interprets the signals as images. The eyes of other animals work in a similar way.

### Read a Diagram

Trace the path of light as it enters the eye.



1. How do reflection and refraction allow animals to see?

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**REVISIT** Revisit the Page Keeley Science Probe on page 73.



# Question 6

## U4M2L2 page 80

- 4-PS4-2 Student will develop and use a model to explain how light reflecting from objects allows animal's eyes to see.

# Key Concepts from page 80

- How do we see?
- Light reflects off an object and enters the eye
- What order does light pass through the eye?
- Cornea, pupil, lens
- What does the lens do?
- Refracts (bends) light to reach the back of the eye
- What is the back of the eye called?
- retina
- What part of the eye sends signals to the brain?
- Retina
- What direction is the image the eye receives?
- Upside-down

# Figure Question 7

## U4M2L1 page 63

### Other Animal Senses

Some animals have senses that humans do not have. Pit vipers and some other snakes have sensory organs that detect infrared light given off by their warm-blooded prey. The light enters a small pit organ, which is located between the snake's eye and nostril. A heat-sensitive part in the organ sends a message to the brain, and the snake strikes.

The duck-billed platypus uses its bill to detect weak electrical fields put out by animals as they move. The bill can also detect movement in the water. The platypus uses this information to quickly locate its prey.

Some bats use echoes to help them navigate and locate prey.

**Echolocation** is the process of finding an object by using reflected sound or echoes. These bats send out a high-pitched sound. This sound hits the prey and bounces back to the bat. The bat then interprets this echo to judge the direction and distance of its prey. Some whales and dolphins use echolocation to gather information from their environment.

1. How are the senses of pit vipers different from yours?

**Sample answer:** Pit vipers detect infrared light, which helps them hunt for warm-blooded animals. They have a pit organ that detects heat.

2. Use an analogy to explain how echolocation works.

**Sample answer:** Echolocation is like throwing a rubber ball against a wall. Like an echo, the ball bounces back once it hits the wall.



 **GO ONLINE** Watch the video *Animal Senses* to learn about how animals interact with their environment.

- 4-PS3-2 Students will use a model to explain how animals sense and interpret their environment.

# Key Concepts from page 63 figure

- What is the name of the extra organ that the animal in the image has?
- pit organ
- What sense organs helps this animal survive?
- Pit organ that senses infrared light from warm-blooded prey

Pit vipers have **pits sensory organs** that detect infrared light given off by their warm-blooded prey.

1. How are the senses of pit vipers different from yours?

Pit vipers detect infrared light, which helps them hunt for warm-blooded animals. They have a pit organ that detects heat.



# Question 8

## U4M2L1 page 64

### The Nervous System

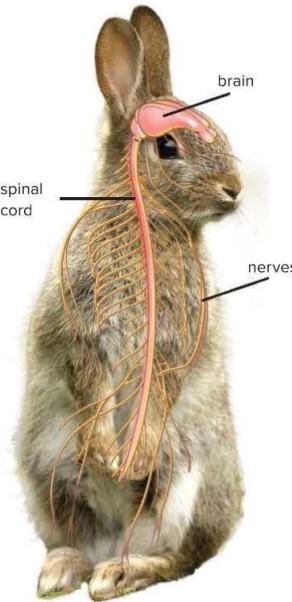
Sensory organs are part of the nervous system. The nervous systems of many animals are similar to the human nervous system. The **nervous system** is the set of organs that uses information from the senses to control all body systems. The **central nervous system** is the part of the nervous system made up of the brain and spinal cord.

The **brain** is an organ that interprets messages received from and sends messages to other body organs. The **spinal cord** is a thick band of nerves inside the spine. It carries messages to and from the brain. Nerves branch off from the spinal cord to all parts of the body. A nerve that is not part of the central nervous system and receives sensory information from other parts of the body is called **peripheral nerve**.

#### Stimulus and Response

Sensory organs have structures called sensory receptors. Different receptors help detect different types of stimulus from the environment. A stimulus is a thing or event that causes a given response. The process of recognizing and interpreting a stimulus is called perception. The brain then makes sense of the information and tells the body how to respond. Sensory information can be stored as memories that can guide future responses.

1. A rabbit sees a fox. Use the diagram to describe what happens in the rabbit's body that causes the rabbit to run away and hide.



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**Sample answer:** The information travels from the eyes, to the nerves, to the spinal cord, and then reaches brain. The brain sends back a respond through the nerves, to run and hide.

**GO ONLINE** Explore *The Brain and Nervous System* to learn about systems of information transfer.

- 4-PS3-2 Students will use a model to explain how animals sense and interpret their environment.

# Key Concepts from page 64

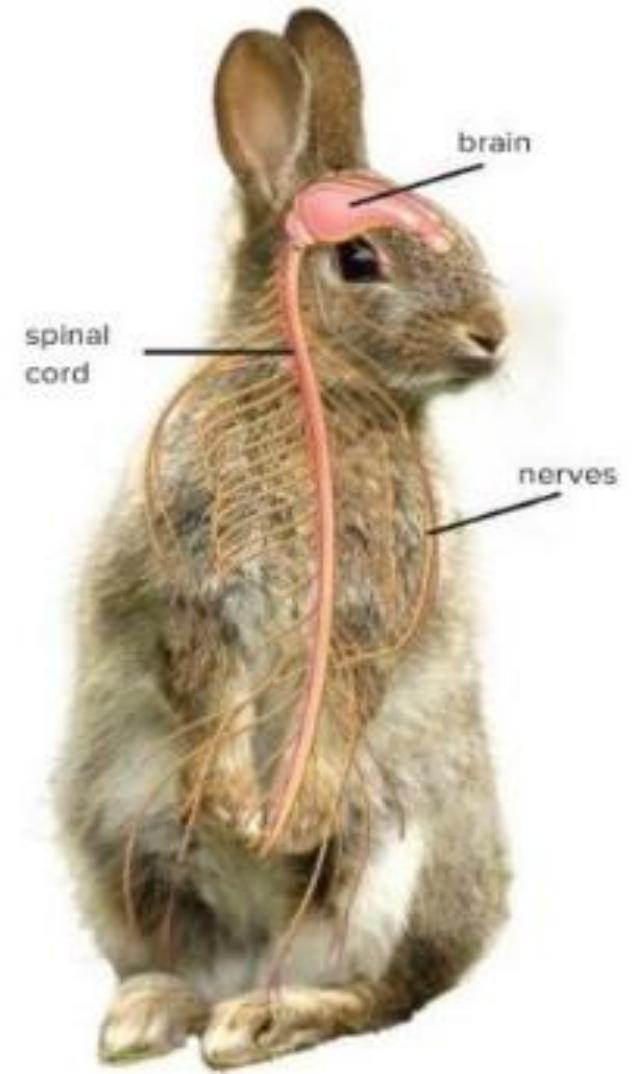
- What is the nervous system?
- Set of organs that uses information from the senses to control all body systems
- What systems make up the nervous system?
- Central nervous system and peripheral nervous system
- What is the central nervous system made of?
- Brain and spinal cord
- What is the function of the brain and spinal cord?
- Brain interprets messages and spinal cord carries messages to and from the brain
- What is the peripheral nervous system made of?
- Nerves

# Key Concepts from page 64

- Which system is connected to sense organs?
- **Peripheral nervous system**
- What do we call a change in the environment that causes us to react?
- **Stimulus**
- What do we call the reaction to the change?
- **Response**
- What part of the body detect stimuli?
- **Sense organs/receptors**
- What part of the body decides on the response?
- **Brain**
- How can responses be stored?
- **As memories**

## Possible Questions for Page 64

- Label the picture
- What system does the brain and spinal cord belong to?
- **Central nervous system**
- What system does the nerves belong to?
- **Peripheral nervous system**



## VOCABULARY

Look for these words as you read:

brain  
central nervous system

echolocation

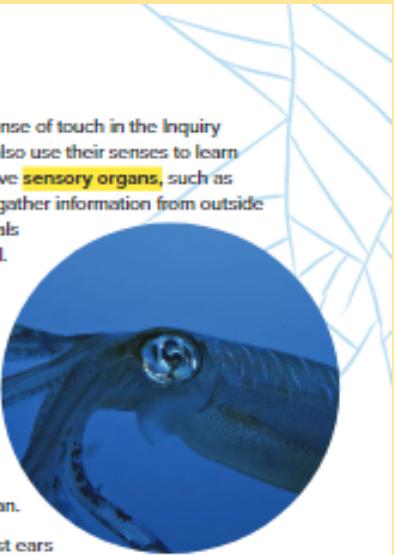
nervous system  
peripheral nerve

sensory organ  
spinal cord



## Animal Senses

Think about how you used your sense of touch in the Inquiry Activity, Sense of Touch. Animals also use their senses to learn about their environments. They have **sensory organs**, such as skin, eyes, nose, and tongue, that gather information from outside the body. Like humans, most animals can see, hear, smell, taste, and feel.



Many animals depend on their eyesight to survive. Colossal squids live in ocean waters. They have some of the largest eyes in the animal kingdom. Each eye is about 26 centimeters (10 inches) wide. Large eyes let in a lot of light. This helps the squid see in the dark depths of the ocean.

African elephants have the biggest ears of any animal. Their ears help them hear sounds from very far away. Elephants communicate by making low, rumbling noises that humans cannot hear; however, other elephants can hear them from miles away.

Some animals use different sensory organs than humans. Ants do not have noses. They use their antennae to leave a scent after finding food and to detect smells. Butterflies use their feet to taste leaves. The taste tells them if the plant is a good place to lay their eggs.

1. Underline the sensory organs discussed in the paragraphs above. Circle them in the photos.
2. Draw and label a diagram to show how ants use their sensory organs to learn about their environments.

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# Question 9

## U4M2L1 page 62

- 4-PS3-2 Students will use a model to explain how animals sense and interpret their environment.

# Key Concepts from page 62

- What sense organs gather information?
- Eyes, ears, tongue, nose, skin
- How does the colossal squid use its senses?
- Large eyes to gather light to see in dark ocean
- How does African elephant and jackrabbit use its sense?
- Large ears to hear over long distances
- How do ants use their sense organ?
- Antennae to smell (no nose) and find food
- How do butterflies taste?
- With their feet

**VOCABULARY**  
Look for these words as you read:  
**concave lens**  
**convex lens**  
**image**  
**opaque**  
**reflection**  
**refraction**  
**translucent**  
**transparent**

**Reflection and Refraction**

Recall how the beam of light traveled in the Inquiry Activity *How Light Travels*. Light has the properties of reflection and refraction.

**Reflection** is the bouncing of light waves off a surface. Most of the light that reaches your eye is reflected light. Look at your desk. If the desk did not reflect light, you could not see it. Most surfaces reflect at least some light. Smooth, shiny surfaces such as mirror reflect almost all of the light falling on them. Dull, rough surfaces reflect the least amount of light. The colors that you see are the colors that are reflected from objects.

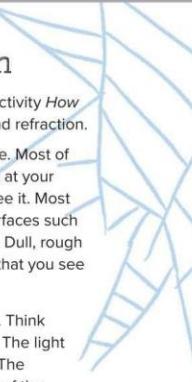
When light reflects off a surface, it changes direction. Think about the mirror and flashlight in the Explore activity. The light rays moving toward a surface are the incoming rays. The reflected light rays are the outgoing rays. The angles of the incoming and outgoing rays are always equal. This is called the law of reflection. The **image** you see in the mirror is a "picture" of the light source that light rays make when bounced off a polished, shiny surface.

1. Draw a diagram to show how light allows objects to be seen. Include the light source, the eye, and label the direction of the light rays. Use the diagram to describe what happens if the eye is closed. What happens if the light is blocked or its path is changed? What if the light source is removed?

**Students could draw light coming from the Sun and traveling to an object. The light should change direction (reflect) off of the object and enter the eye.**

**Sample answer:** If the eye is closed or the light source is removed, nothing can be seen. If the light is blocked or its path is changed, the object will not be seen because its reflected light will not enter the eye.

78 EXPLAIN Module: Information Processing and Transfer



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# Question 10

## U4M2L2 page 78

- 4-PS4-2 Student will develop and use a model to explain how light reflecting from objects allows animal's eyes to see.

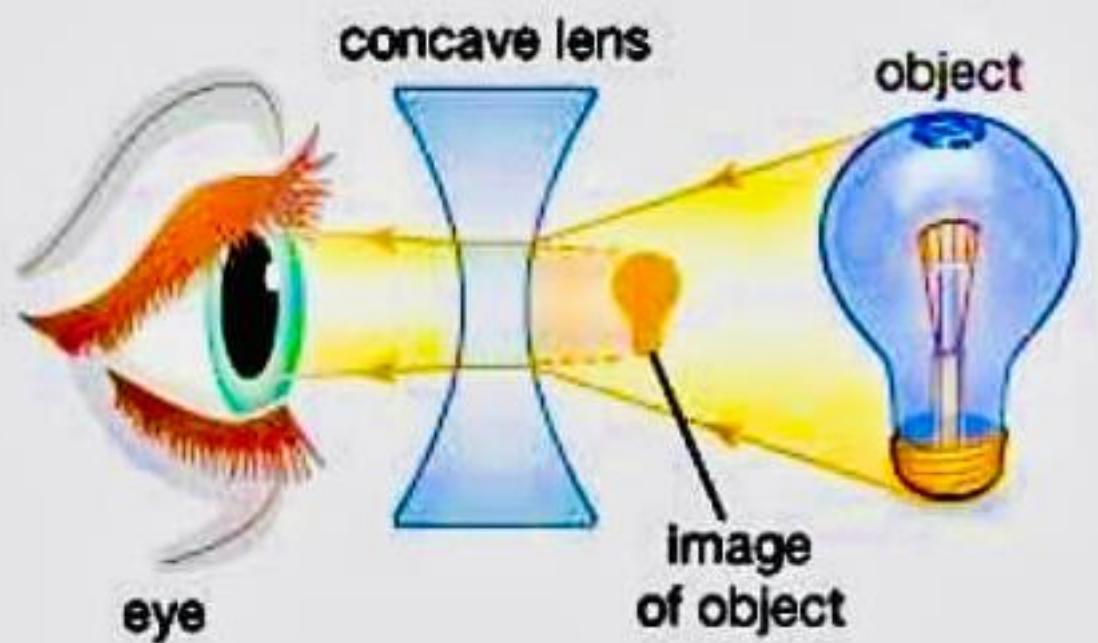
# Possible Questions for Page 78

- What is reflection?
- Bouncing of light waves off a surface
- How do we see?
- Light reflects off objects into our eyes
- What surfaces reflect more or less light?
- Smooth surfaces reflect more light and rough surfaces reflect less light
- Describe the angles in the picture?
- They are equal
- What is an image?
- The “picture” of the light sources that light rays make when bounced off a surface

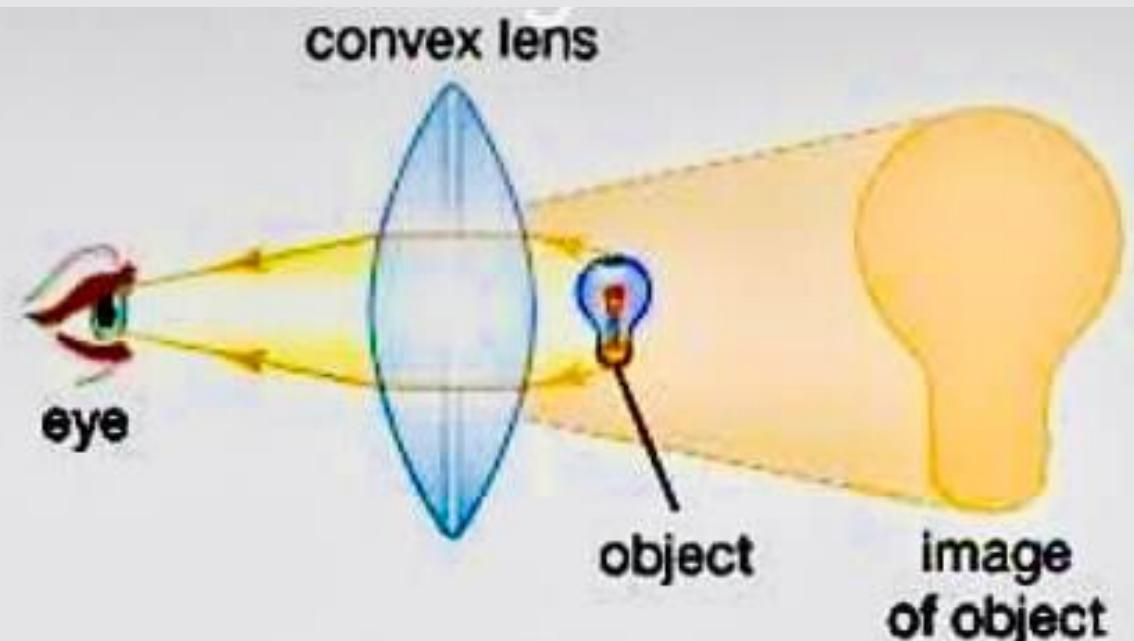
## Possible Questions for picture on Page 78

- What type of mirror is shown in the image?
- Convex mirror
- What direction is the mirror curved?
- Curved outward
- What does the convex mirror do?
- Allows the driver to see a wide area behind the car





Helps  
people  
see far



Helps  
people  
see close

Concave lenses are used in eyeglasses for people who are nearsighted, or have trouble seeing objects that are far away. Convex lenses are needed for people who are farsighted, or have trouble seeing objects that are up close.



## How Animals Use Their Eyes

The eyes of predators, animals that hunt other animals, are usually on the front of their head. This helps them to see how far away something is, especially when hunting for other animals. The eyes of prey, animals that predators eat, are usually on the sides of their heads. This helps them to see danger coming from the side and from behind them.

Most fish have eyes on the sides of their heads. These eyes have special structures that allow fish to see movement underwater. This feature helps fish see creatures that may want to eat them. It also helps fish catch prey moving past them.

What can eyes located in front of the head do that eyes located on the sides of the head cannot do?

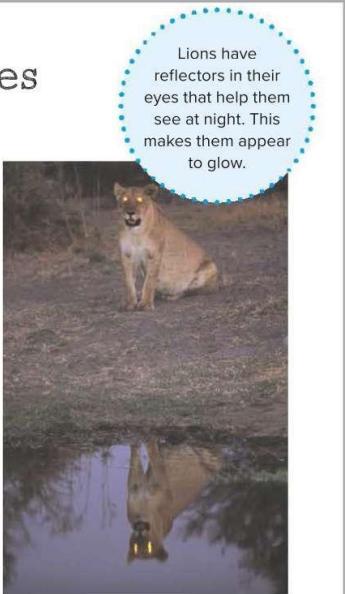
**Sample answer: Eyes on the front of the head can see how far away something is.**

Flies, bees, and other insects have compound eyes that look like two big bubbles. Each eye can have thousands of small lenses. These lenses allow the insect to detect danger coming from all directions. This is why it is so hard to swat a fly!

Owls have eyes that are up to a hundred times more sensitive to low light than human eyes. This helps the owl to see prey at night. The eyes of an eagle are similar in size to human eyes. Objects appear much larger to eagles than they appear to humans. This helps eagles see prey from a distance. Eyes help animals in many different ways.

### Talk About It

Compare the eyes of humans and birds. Discuss your ideas with a partner.



**GO ONLINE** Watch the video *How Do Animals See?* to learn more about how animals use their eyes.

# Question 11

## U4M2L2 page 83

- 4-PS4-2 Student will develop and use a model to explain how light reflecting from objects allows animal's eyes to see.

## Possible Questions for Page 83

- What animal has eyes on the front of their head and how does this help them?
- Predators, when hunting allows them to see how far away something is.
- Where are the eyes of prey and why?
- On the side of their head, to see danger coming from the side and behind them.
- What is special about the eyes of the fish?
- Have special structures to see under water, help them see animals that want to eat them or for them to see prey.
- Where are the eyes of the fish?
- On the side of their head

## Possible Questions for Page 83

- What eyes do insects have and how do they work?
- Compound eyes, made of thousands of lenses
- How do compound eyes help the insect?
- Allows them to detect danger coming from all directions
- What is special about owl eyes?
- Up to a hundred times more sensitive to low light than human eyes
- How are eagles' eyes the same as humans and how are they different?
- Same size, objects appear much larger.
- (helps them see prey from a distance)

## Plant Survival and Behavior

Environments can present challenges to the organisms that live there. An **adaptation** is a physical trait or behavior that helps an organism survive in its environment.

Many plants have parts that are physical adaptations. For example, desert plants have adaptations for living in a hot, dry environment. Cacti have thick, waxy stems that store water. They have dense, shallow roots to soak up rain quickly. Rainforest plants, such as orchids, have adaptations that help them survive in hot, wet conditions. An orchid's aerial roots absorb nutrients and anchor the plant high in a tree. Orchids also have leaves that are shaped to drain excess water to prevent rotting.

Many plants have adaptations to defend themselves from animals that would eat them. Some plants have thorns. Others produce chemicals that are poisonous or taste bad.



**Construct an argument from evidence** to explain how the **parts** of each plant's **system** help it survive.

**Sample answer:** The roots, stems, leaves, and flowers help them get the resources that they need to survive and reproduce in their unique habitats. Their structures look different but still have mostly the same purpose.



# Question 14

## U4M1L1 page 16

- 4-LS1-1 Students will construct an argument to explain how plants use their structures to survive, grow and reproduce.

# Key Concepts from page 16

- What is an adaptation?
- A physical trait or behavior that helps an organism survive in its environment
- What are the 2 types of adaptations?
- Physical and behavioral
- How is a cactus adapted to its environment (hot and dry)?
- Thick waxy stems store water, dense shallow roots take in water quickly.
- How is an orchid adapted to its environment (warm and wet)?
- Aerial roots help it absorb water above ground and shape of leaf help it drain water so it does not rot

# Figure Question 16 U4M1L1 page 29

3. Draw the second animal you chose, and label its parts.

Sample answer: Drawing of a western fence lizard with the following structures labeled: scales, claws, mouth, nostrils, tail, eyes.

4. In the table, list each animal structure that you labeled. Think about how the animals use each structure, and add the possible function to the table. Use a separate piece of paper if needed.

Structure	Possible Function
teeth	break down food
eyes	find prey
claws	defense
scales	protection

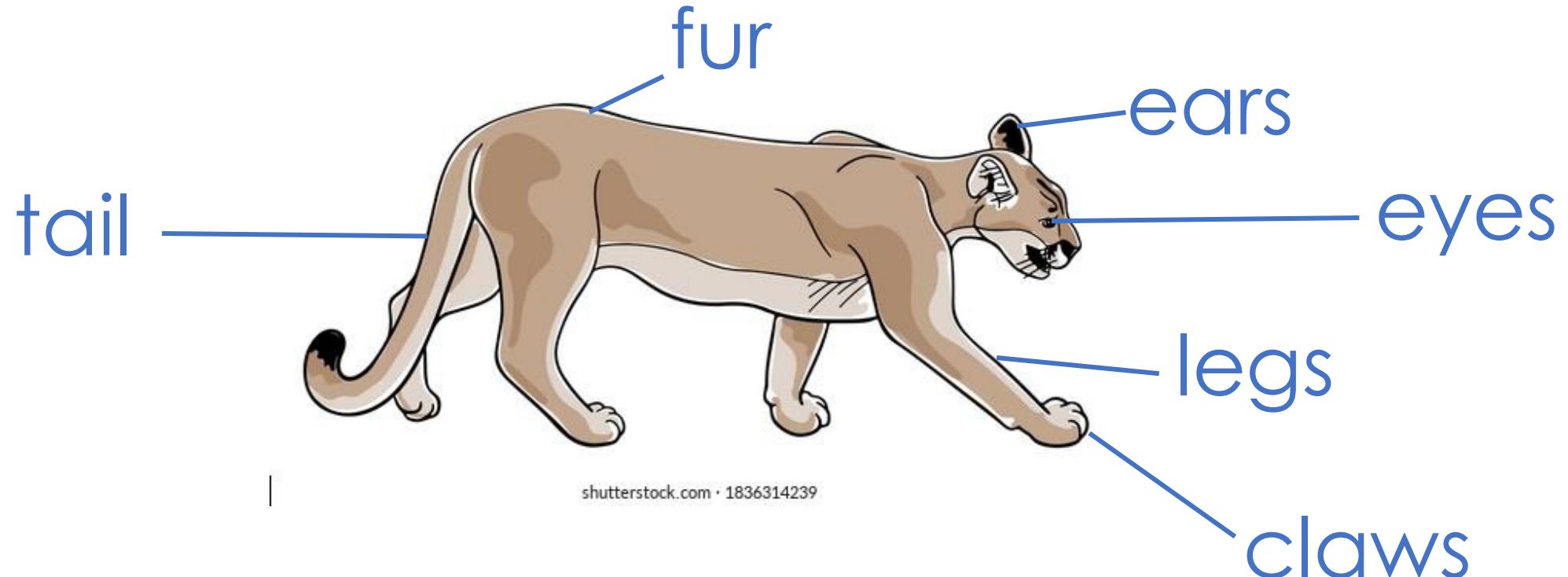
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EXPLORE Lesson 2 Structures and Functions of Animals 29

4-LS1-1 Students will construct an argument to explain how animals use their structures to survive, grow, and reproduce.

# Possible question Page 29

- Draw an animal and label 4 external structures on its body.



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# Possible question Page 29

In the table, list 4 structures and their function

Structure	Possible Function
teeth	break down food
eyes	find prey
claws	defense
scales	protection

# Question 17

## U4M1L1 page 12

### Plant Parts

Most plants have roots, stems, and leaves. These parts, or structures, help the plant meet its needs and carry out life functions.

#### Roots

Plant roots take in water and dissolved nutrients from the soil. Roots also hold the plant in place. Some roots store food the plant has made.

#### Stem

The stem supports the plant. It is also part of a plant's transport system. There are two types of stems: soft stems and woody stems. Soft stems are green and are flexible. Woody stems are hard and are often covered in bark. Tree trunks are examples of woody stems.

Stems also allow materials to move inside the plant through a system of tubes. The tubes in the stems carry water and dissolved nutrients.

#### Label a Diagram: Roots, Stems, and Leaves

Label the different parts of the plant. Then describe the functions of each of the plant parts below.

##### Roots:

hold the plant in place, take in water and nutrients

##### Stems:

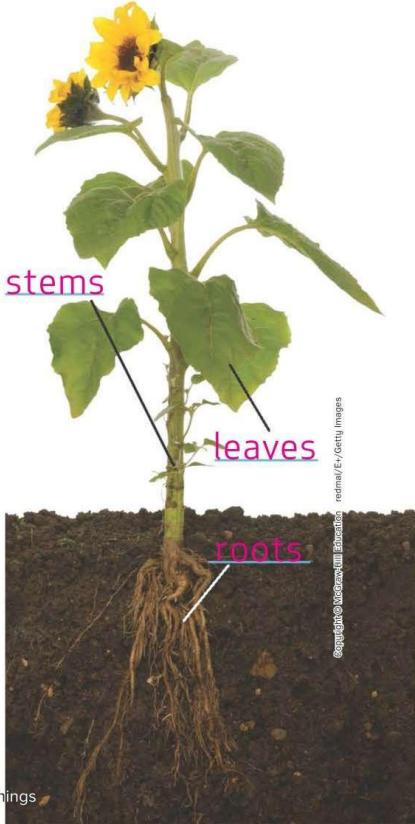
support the plant, transport materials

##### Leaves:

capture light and are the site of gas exchange

#### Talk About It

Use evidence to construct an argument that plant structures function to support survival.



- 4-LS1-1 Students will construct an argument to explain how plants use their structures to survive, grow and reproduce.

# Key Concepts from page 12

- What is the function of the roots?
- To take in water and dissolved nutrients from the soil, to store food and to hold the plant in place.
- What is the function of the leaves?
- Place where gas is exchanged, and food is made
- What is the function of the stem?
- To support the plant, transport materials
- How does the leaf's shape help with its function?
- Most leaves are broad and flat to get most light
- What are the 2 types of stems?
- Soft and woody
- What causes water to move through the plant?

# Possible Questions for Page 12

## Label a Diagram: Roots, Stems, and Leaves

Label the different parts of the plant. Then describe the functions of each of the plant parts below.

**Roots:**

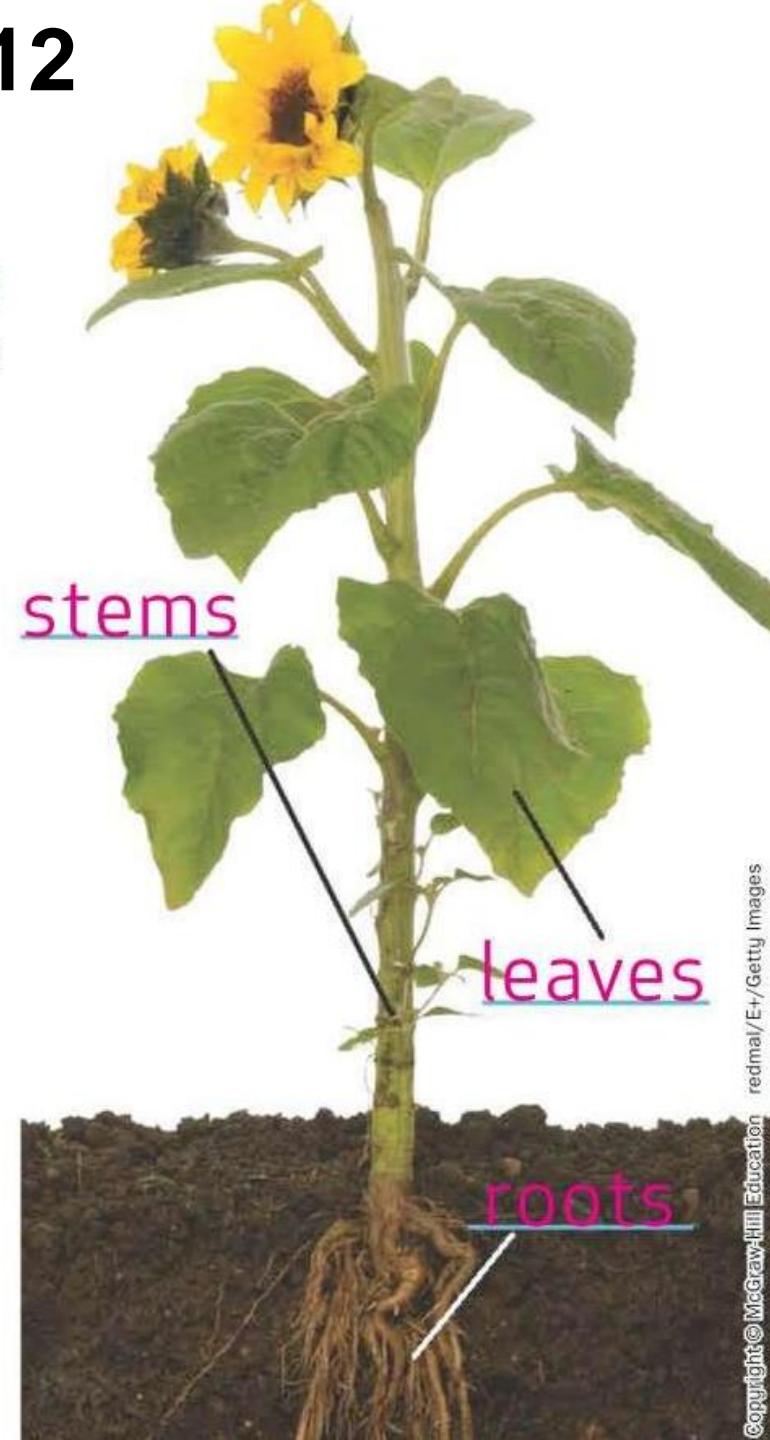
hold the plant in place,  
take in water and  
nutrients

**Stems:**

support the plant,  
transport materials

**Leaves:**

capture light and are the  
site of gas exchange



redmal/E+/Getty Images

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# Figure Question 18 U4M2L2 page 81

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### Transparent, Translucent, and Opaque

Light that strikes a material may pass through it. Materials that let light through, so objects on the other side seem clearly, are called **transparent**. Clear glass and clear plastic are transparent. You can see objects when you look at them through a transparent material.

Materials that let some light through, so objects on the other side appear blurry, are called **translucent**. Waxed paper and frosted glass are examples of translucent materials. If an object completely blocks light from passing through, it is called **opaque**. Whether an object is transparent, translucent, or opaque depends on the material, its thickness, and the color of light. Thicker objects tend to be more opaque.

**2. ENGINEERING Connection** When designing a new device, when would you want to use translucent materials? Give an example.

**Sample answer:** You would use translucent materials when you need to let light in but you do not need to be able to see objects clearly. These types of materials work well in situations where people need light, but also want privacy. An example is a shower door.

EXPLAIN Lesson 2 Role of Animals' Eyes 81

- 4-PS4-2 Student will develop and use a model to explain how light reflecting from objects allows animal's eyes to see.

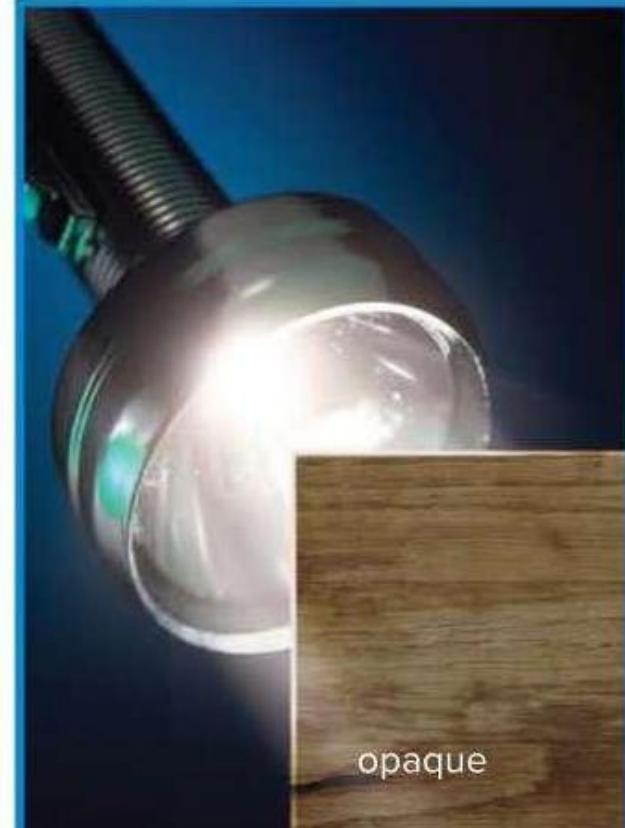
# Key Concepts from page 81



Clear glass lets light pass through it.



Frosted plastic scatters light in different directions.



Wood prevents light from getting through.

# Possible questions from page 81

- Label the three pictures
- Give examples of the materials
- Transparent- clear glass
- Translucent – frosted glass, sunglasses
- Opaque- wood
- Explain what is happening to the light in each picture.

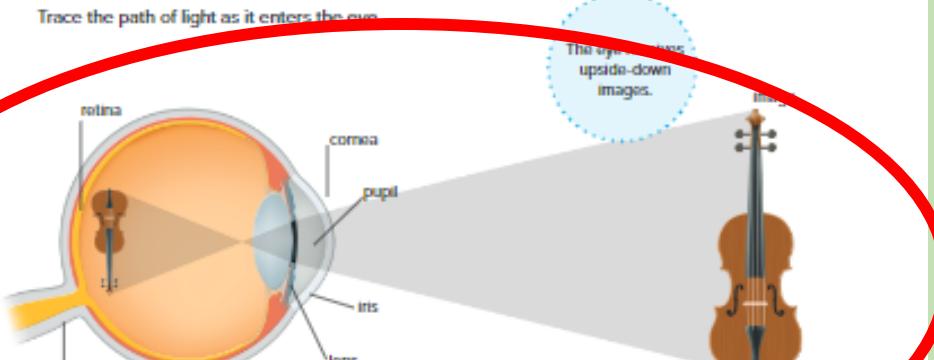
# Figure Question 19 U4M2L2 page 80

**The Human Eye**

You see an image when light reflects off an object and enters your eye. The diagram shows the different parts of the eye that light passes through. Light passes through the cornea and the pupil in your iris. The lens refracts the light so that it hits the retina on the back of the eye. The retina sends signals to the brain, and the brain interprets the signals as images. The eyes of other animals work in a similar way.

**Read a Diagram**

Trace the path of light as it enters the eye.



The diagram illustrates the path of light entering the eye. Light from a violin on the right passes through the cornea, pupil, and lens to hit the retina on the back of the eye. A callout bubble states, "The eye makes upside-down images." The diagram is circled in red.

1. How do reflection and refraction allow animals to see?

REVISIT Revisit the Page Keeley Science Probe on page 73.

PAGE KEELEY SCIENCE PROBES

80 EXPLAIN Module: Information Processing and Transfer

- 4-PS4-2 Student will develop and use a model to explain how light reflecting from objects allows animal's eyes to see.

# Possible questions from page 80

- Label parts of the diagram
- How does the eye receive the image?
- **Upside down**
- Name the parts that light travels through the eye.
- **Cornea ---pupil—lens—retina—optic nerve**
- What material is the cornea made from and why.
- **Transparent, for light to pass through.**

### Reflexes

The body responds in different ways to stimuli. A reflex is a quick reaction that occurs without waiting for a message to be sent from nerves to the brain. For example, touching something hot causes the hand to quickly pull away. No conscious thought is involved in this response. Instead, this reflex is an action controlled by the spinal cord.

2.  **ENGINEERING Connection** Describe a type of technology or tool that has been designed to improve a human sense.

**Sample answer:**  
Eyeglasses are a technology that helps people see better.

### Talk About It

How can memory guide your response to the environment? Discuss with a partner.

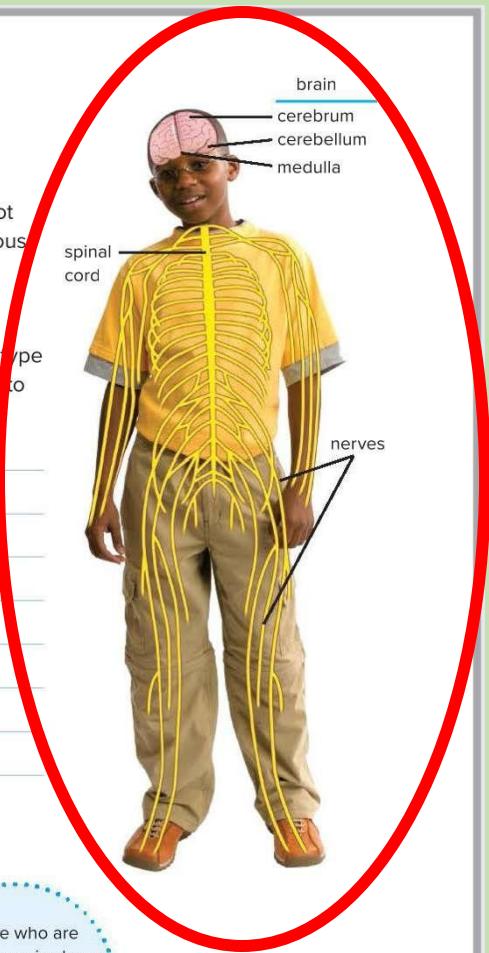


People who are visually impaired can process information by using their other senses much more efficiently.

 **GO ONLINE** Use the Personal Tutor Reflexes to learn how reflexes work to keep you safe.

### REVISIT

Revisit the Page Keeley Science Probe on page 55.



# Figure Question 20

## U4M2L1 page 65

- 4-PS3-2 Students will use a model to explain how animals sense and interpret their environment.

# Possible questions Page 65 figure

- Label the diagram (learn the parts in the picture)
- What parts in the diagram are part of the central nervous system?
- Brain and spinal cord
- What parts in the diagram are part of the peripheral nervous system?
- nerves
- What parts in the diagram controls the response in a reflex?
- Spinal cord

\*These are only suggested guides for possible questions. Please study all pages mentioned carefully.

\*Questions might appear in a different order in the actual exam, or on the exam paper in the case of G4

