Plant and Animal Cells

Plant cells are different from animal cells. Plant cells have a cell wall that makes the plant cell stiffer than an animal cell. Plant cells also have small, green bodies shaped like footballs in the cytoplasm. These are chloroplasts. Chloroplasts are responsible for photosynthesis. Without chloroplasts, plant cells could not make their own food.

Look at the pictures. Write the letter or letters next to the term that matches each cell part.

_____ cell membrane  _____ cytoplasm  _____ cell wall  _____ chloroplasts  _____ nucleus

Answer these questions.

1. Which two parts are found only in plant cells? ____________________________

2. In what cell parts does photosynthesis take place? ____________________________

3. What part of a plant keeps the plant stiff? ____________________________

4. What cell part allows only certain substances to diffuse into and out of the cell? ____________________________

5. Which cell is a plant cell? ____________________________
Cells

Robert Hooke, working with a microscope and some cork in the 1600s, was the first scientist to identify and name the basic unit of living things, the cell. Hooke's discovery led to the development of the cell theory, with its three parts. First, all living things are made up of cells. Second, the cell is the smallest unit of structure and function in all living things. Third, all cells can reproduce to form new cells.

Although cells are the basic units of living things, they are made up of many parts, each with a specific function. All cells are surrounded by a cell membrane that controls what goes into and out of the cell. The nucleus is the command center of a cell. It controls everything that goes on inside the cell. Between the cell membrane and the nucleus is a thick liquid called the cytoplasm. Suspended within the cytoplasm are other structures called organelles. An organelle is any cell structure with a specific job to do. For example, mitochondria supply a cell with the energy it needs.

Label the cell parts on the diagram below.

Answer these questions on another sheet of paper.

1. Who was the first person to use the term cell?
2. In what material did he first see cells?
3. What are the three parts of the cell theory?
Adaptations

Over time, organisms have adapted to their environment in order to survive. Match each term in the word box to the animal it describes.

stems of plants store water in dry conditions
hibernate to survive low food supplies in winter
have blubber to insulate body against cold
have special hemoglobin for high altitude living
have densely packed fur so skin does not get wet
have specialized digestive tract to digest plant cellulose

1
2
3
4
5
6
Defense Mechanisms

Each of these animals has a special defense adaptation. Use the terms in the word box to identify the animal and its defense mechanism.

<table>
<thead>
<tr>
<th>Animal:</th>
<th>Defense:</th>
</tr>
</thead>
<tbody>
<tr>
<td>skunk</td>
<td>pretends it is dead</td>
</tr>
<tr>
<td>sprays offensive odor</td>
<td>opossum</td>
</tr>
<tr>
<td>releases quills upon contact</td>
<td>retreats into a shell</td>
</tr>
<tr>
<td>porcupine</td>
<td>runs and kicks with powerful legs</td>
</tr>
<tr>
<td>ostrich</td>
<td>tortoise</td>
</tr>
<tr>
<td>octopus</td>
<td>releases a cloud of ink</td>
</tr>
</tbody>
</table>

![Animal illustrations](image-url)
Camouflage

Camouflage is the concealment of animals with their surroundings. Match each animal to the description of its camouflage technique.

<table>
<thead>
<tr>
<th>snowshoe hare</th>
<th>owl butterfly</th>
<th>walking stick</th>
</tr>
</thead>
<tbody>
<tr>
<td>moth</td>
<td>caterpillar</td>
<td>walking leaf</td>
</tr>
<tr>
<td>halibut</td>
<td>deer</td>
<td></td>
</tr>
</tbody>
</table>

1. The colors and patterns on the wings of this animal match the bark where it rests during the day.

2. This animal resembles the twigs where it feeds, hiding it from other predators.

3. This insect displays mimicry. The spots on its wings look like the eyes of a predatory bird, scaring off other predators.

4. This larval stage of the swallowtail butterfly also has large spots resembling eyes, making it look frightening to birds and other predators.

5. This mammal changes color during the summer and winter so that it is able to blend in with the snow or the vegetation of its habitat.

6. This insect has enlargements on its legs and abdomen that make it resemble the plants it feeds on.

7. This fish has a flattened body and coloration that allow it to blend in with the sea floor.

8. The young of this mammal have spotted fur to allow them to blend in with the dappled sunlight of the forest floor.
Animals have many adaptations for finding or catching food. They may have sticky tongues, sharp teeth, beaks, claws, tentacles, or a keen sense of smell. Dolphins and bats use a type of sonar called **echolocation** to find their food. Many spiders spin a sticky web to trap their dinner.

Use the words in the box to complete the sentences.

| smell | tentacles | claws | sticky tongue | sharp teeth | echolocation | web |

1. An octopus uses its _____________ to catch its food.
2. A crab uses its _____________ to catch food.
3. A frog has a _____________ that it flicks out to catch insects.
4. A pig uses its nose and keen sense of _____________ to find its food.
5. A tiger has _____________ in its mouth to help it catch food.
6. A dolphin uses bouncing sound waves, a method called _____________, to find food.
7. Many spiders spin a sticky _____________ to catch their food.
Birds' beaks and feet are shaped to help them adapt to their environment. Water birds have webbed feet for swimming. Other birds have separate toes for walking or curved claws for perching. Beaks come in all shapes and sizes. Each type helps the bird catch its food.

Identify how each type of bird feet and beak are used.

<table>
<thead>
<tr>
<th>walking</th>
<th>swimming</th>
<th>perching</th>
<th>scratching</th>
</tr>
</thead>
</table>

1. 

2. 

3. 

4. 

- straining water
- fishing
- eating insects
- sucking nectar

1. 

2. 

3. 

4. 

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20 Life Science
How Animals Protect Themselves

Some animals have claws, horns, or hooves. Others have sharp teeth or beaks. There are animals that disguise themselves to look like their surroundings, while others warn off enemies with bright colors. Angry sounds can scare away an enemy, too. Animals protect themselves in many ways.

Use the words in the box to complete the sentences.

<table>
<thead>
<tr>
<th>fangs and a hiss</th>
<th>sharp teeth</th>
<th>claws</th>
<th>tentacles</th>
<th>horns</th>
</tr>
</thead>
<tbody>
<tr>
<td>bad smell</td>
<td>bright colors</td>
<td>bark</td>
<td>roar</td>
<td>quills</td>
</tr>
</tbody>
</table>

1. A porcupine protects itself with ____________________.
2. A skunk produces a ____________________.
3. A butterfly warns its enemies with its ____________________.
4. A dog scares its enemies with its ____________________.
5. A lion uses its loud ____________________.
6. A lobster protects itself with ____________________.
7. A snake protects itself with ____________________.
8. A buffalo has ____________________.
9. A jellyfish protects itself with ____________________.
10. A shark has ____________________.
Plants cannot run away from their enemies, so they need other ways to protect themselves from being eaten. Rosebushes, bougainvillea, and blackberry bushes have thorns. Marigolds produce an odor that insects do not like. If you touch poison ivy leaves, you will get an itchy rash. The leaves of oleander and rhubarb can make you very sick. Hemlock and nightshade are so poisonous they can cause death.

Use the words in the box to complete the sentences.

- thorns
- odor
- poison
- spines
- needle-like
- rash

1. The leaf edges of stinging nettle have thin, ________________ projections that prick the skin and inject a stinging chemical.

2. Rosebushes have ________________ on their branches.

3. Some plants contain ________________ that can make you sick if you eat them.

4. Marigolds make an ________________ that keeps insects away.

5. Cactus plants protect themselves with ________________.

6. Touching poison ivy will give you a ________________.
Plants have to adjust to the sun, rain, wind, and changing seasons. Some plants need to grow in the full sun, while others must live in the shade. Fruit trees need lots of water, but a cactus survives with very little. Plants tend to grow closer to the ground in places that are very windy. Some plants may appear dead during winter, but only the leaves or top part die off. New sprouts will appear in the spring. All of these adaptations help the plant to survive.

Match each word with its description.

1. ______ dormant  
2. ______ spring  
3. ______ ferns  
4. ______ adaptation  
5. ______ cactus  
6. ______ fruit trees  

A. grow best with lots of water and full sun  
B. grow best in shady areas  
C. can survive with very little water  
D. means “sleeping” or “inactive”  
E. a tree loses its leaves to survive a cold winter  
F. season for new growth