Flowering Plants

Directions: Read and Answer all questions in CAF

So what exactly is a flower?

This close-up view of a lily flower shows the fine detail of this structure. Why are flowers so colorful? What is the purpose of all the parts? They were one of the last adaptations of the plant kingdom, suggesting immense evolutionary significance.

Flowering Plants

Angiosperms, or flowering seed plants, form seeds in ovaries. As the seeds develop, the ovaries may develop into fruits. Flowers attract pollinators, and fruits encourage animals to disperse the seeds.

1) What is the purpose of flowers?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2) What is the purpose of fruits?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Parts of a Flower

A flower consists of both male and female reproductive structures. The main parts of a flower are shown in the figure on the next page. They include the stamen, pistil, petals, and sepals.

- The stamen is the male reproductive structure of a flower. It consists of a stalk-like filament that ends in an anther. The anther contains pollen sacs, in which meiosis (cell division) occurs and pollen grains form. The filament raises the anther up high so its pollen will be more likely to blow in the wind or be picked up by an animal pollinator.
3) What is the **stamen**?

4) What are the 2 parts of the stamen?

5) What does the anther contain?

6) Why is it important for the anther to be at the top of the stalk?

- The **pistil** is the female reproductive structure of a flower. It consists of a **stigma**, **style**, and **ovary**. The stigma is raised and **sticky to help it catch pollen**. The style supports the stigma and connects it to the **ovary**, which contains the egg.

7) What are the parts of the **pistil**?

8) What is the stigma and what adaptation does it have?

9) What connects the stigma to the ovary?

10) What does the ovary contain?

- **Petals** attract pollinators to the flower. Petals are often brightly colored so pollinators will notice them.

11) What purpose do petals serve?

- **Sepals** protect the developing flower while it is still a bud. Sepals are usually green, which camouflages the bud from possible consumers.

12) What adaptation do sepals have and why do they have this adaptation?
A flower includes both male and female reproductive structures.

**Flowers and Pollinators**

Many flowers have bright colors, strong scents, and sweet nectar to attract animal pollinators. They may attract insects, birds, mammals, and even reptiles. While visiting a flower, a pollinator picks up pollen from the anthers. When the pollinator visits the next flower, some of the pollen brushes off on the stigma. This allows cross-pollination, which increases genetic diversity.

13) What adaptations can a flower have to attract pollinators?

**Other Characteristics of Flowering Plants**
Although flowers and their components are the major innovations of angiosperms, they are not the only ones. Angiosperms also have more efficient vascular tissues. Additionally, in many flowering plants the ovaries ripen into fruits. Fruits are often brightly colored, so animals are likely to see and eat them and disperse their seeds.

14) Where can the ovaries ripen?

________

15) What adaptations do fruits have?

[Image]

Brightly colored fruits attract animals that may disperse their seeds. It's hard to miss the bright red apples on these trees.

Evolution of Flowering Plants

Flowering plants are thought to have evolved at least 200 million years ago from gymnosperms like Gnetae. The earliest known fossils of flowering plants are about 125 million years old. The fossil flowers have male and female reproductive organs but no petals or sepals.

Scientists think that the earliest flowers attracted insects and other animals, which spread pollen from flower to flower. This greatly increased the efficiency of fertilization over wind-spread pollen, which might or might not actually land on another flower. To take better advantage of this “animal labor,” plants evolved traits such as brightly colored petals to attract pollinators. In exchange for pollination, flowers gave the pollinators nectar.

16) What are two adaptations flowering plants evolved to take advantage of animal labor?
Giving free nectar to any animal that happened to come along was not an efficient use of resources. Much of the pollen might be carried to flowers of different species and therefore wasted. As a result, many plants evolved ways to "hide" their nectar from all but very specific pollinators, which would be more likely to visit only flowers of the same species. For their part, animal pollinators co-evolved traits that allowed them to get to the hidden nectar. Two examples of this type of co-evolution are shown in the figures on the next page.

The hummingbird has a long narrow bill to reach nectar at the bottom of the tube-shaped flowers. The bat is active at night, so bright white, night-blooming flowers attract it. In each case, the flowering plant and its pollinator co-evolved to become better suited for their roles in the symbiotic relationship.

17) Describe the two adaptations in the animals above.

18) What type of symbiotic relationship is this? Describe in detail both roles.

Some of the most recent angiosperms to evolve are grasses. Humans started domesticating grasses such as wheat about 10,000 years ago. Why grasses? They
have many large, edible seeds that contain a lot of nutritious stored food. They are also relatively easy to harvest. Since then, humans have helped shaped the evolution of grasses. Grasses supply most of the food consumed by people worldwide.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>angiosperm</td>
<td>Type of seed plant that produces seeds in the ovary of a flower.</td>
</tr>
<tr>
<td>cotyledon</td>
<td>The embryonic first leaves of a seedling; a significant part of the embryo within the seed of a plant.</td>
</tr>
<tr>
<td>eudicots</td>
<td>Plant whose embryos form two cotyledons.</td>
</tr>
<tr>
<td>magnolids</td>
<td>Plant whose embryos form two cotyledons.</td>
</tr>
<tr>
<td>monocots</td>
<td>Plant whose embryos form just one cotyledon.</td>
</tr>
<tr>
<td>ovary</td>
<td>Organ where eggs form; characteristic of plants and animals.</td>
</tr>
<tr>
<td>petal</td>
<td>Outer parts of flowers that are usually brightly colored to attract animal pollinators.</td>
</tr>
<tr>
<td>pistil</td>
<td>Female reproductive structure of a flower that consists of a stigma, style, and ovary.</td>
</tr>
<tr>
<td>sepal</td>
<td>Part of a flower that helps protect it while it is still in bud.</td>
</tr>
<tr>
<td>stamen</td>
<td>Male reproductive structure of a flower; consists of a stalk-like filament and a pollen-producing anther.</td>
</tr>
<tr>
<td>style</td>
<td>Part of the pistil, the female reproductive structure of a flower; supports the stigma and connects it to the ovary.</td>
</tr>
<tr>
<td>pollen</td>
<td>Tiny grains that bear the male gametes of seed plants and transfer sperm to female reproductive structures.</td>
</tr>
</tbody>
</table>
Ecosystem Disturbances

Imagine you purchase an aquarium and fill it with some sand, a few aquatic plants, and some small rocks. Add water and a couple of fish to the aquarium and voila! Your miniature ecosystem is complete.

An ecosystem consists of the living and non-living things that interact with one another in a particular location. In the example above, the fish and plants both live in the water, plants provide oxygen for the fish and rocks provide them with shelter, and the fish nibble at the plants and prevent overgrowth. All the elements of the ecosystem you have created are in harmony. When this type of stability exists in an ecosystem, we call it a balanced ecosystem.

1. What is a balanced ecosystem?

Unfortunately, ecosystems do not always remain in balance. Environmental changes can alter the stability of an ecosystem, creating unbalanced ecosystems. This may be helpful to an ecosystem in some instances, but it also can be destructive. Think of how the ecosystem in your aquarium benefits when you clean the water. Now imagine how your aquarium's ecosystem might suffer if all of the plants were to die.

2. What would happen to your aquarium ecosystem if all the plants did die?

Natural Disturbances

Natural disturbances are one way an ecosystem can become unbalanced. As the name implies, natural disturbances have natural causes, such as weather, geological forces, or biological changes. Fires and floods are examples of natural disturbances that force change upon an ecosystem. Natural disturbances are also caused by diseases, severe storms, insects, volcanic activity, earthquakes, droughts, and long-term freezing.

3. List 5 examples of Natural Disturbances:

Let's say you go on vacation for a week and leave your aquarium. While you are gone, a blizzard hits and your house loses power and heat for the week. Temperatures drop to near freezing inside your home for several days. The water temperature falls below the temperature the fish needed to survive, and when you return home, all the fish in the aquarium have died.

Natural disturbances can do a lot of damage to an ecosystem, even killing plants or animals, as in the aquarium example. But natural disturbances are nothing new, and the effects are usually temporary and the ecosystem will eventually recover. It may be the same after it recovers, or it may include new plants and animals that balance out the ecosystem as it adjusts to the new environmental conditions. It may be hard to imagine ecosystems recovering after some natural events. For example, if you've ever stood among charred trees and blackened ground after a forest fire, you know that fires and other natural disturbances can do a tremendous amount of damage.
However, in some cases, natural disturbances can be beneficial to an ecosystem. There are even some ecosystems that have adapted to become dependent on natural disturbances to maintain their balance. For example, longleaf pine forests depend on occasional fires to control undergrowth in the forest. Without a forest fire clearing the way for new seedlings to grow, the tiny new trees are unable to compete with the thick brush and die.


________________________________________________________________________

________________________________________________________________________

Human Disturbances

Not all changes to an ecosystem are caused by natural forces. Ecosystems are also affected by human disturbances, which are caused by people. Chemical pollution and urbanization are examples of human disturbances that force change upon an ecosystem. Other examples include deforestation, mining, and light or noise pollution.

5. What are human disturbances?

________________________________________________________________________

________________________________________________________________________

6. List 5 examples of human disturbances:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Think of your aquarium again. When your five-year-old cousin came to visit, he really liked feeding the fish and watching them eat. Unfortunately, he kept dumping fish food in the aquarium over and over again. This caused the water to turn cloudy, and the fish had a hard time filtering the water through their gills to breathe. Luckily you were able to put clean water back into the aquarium as soon as your cousin left and the fish survived.

Just like your cousin’s presence had an effect on your aquarium and put stress on the fish, human presence has had a significant effect on the world's ecosystems. As we use chemicals, remove trees, move water, and change the landscape to fit our needs, we affect ecosystems. We may introduce non-native species (species that have not adapted to that place/ecosystem, also known as invasive species) that disrupt an ecosystem or pollute the air and cause climate change. Most human impact is negative because it places undue pressure on ecosystems to adapt.

7. Why is most human impact negative on ecosystems?

8. What’s an invasive species?

★ BONUS QUESTION!!! ★

When we were learning about biodiversity, we read about an invasive species. What species did we read about and what was the affect that species had on the ecosystem into which it was placed.
Grade 6 REVIEW #8:
EVOLUTION

Directions: RAQ!!! (Read, annotate, and answer the questions) When annotating, you should summarize the most important information from the paragraph you just read. You should have at least two good summary annotations per page.

Evolution

Evolution is changes within a species over generations. This definition encompasses small-scale evolution (changes in gene frequency in a population from one generation to the next) and large-scale evolution (the descent of different species from a common ancestor over many generations). Evolution helps us to understand the history of life. Scientists seek evidence that can prove some species are related to other species in order to show they have a common ancestor and therefore EVOLVED.
There are 5 main pieces of evidence scientist’s use as proof of evolution.

Evidence #1: Transitional Fossils
The fossil record is the history of life recorded by remains from the past. Fossils include skeletons, shells, seeds, insects trapped in amber, and imprints of leaves. When scientists find a fossil they try to connect it to a species alive today. Often the fossils they find are from extinct species. However, some of the fossils show strange “in between” forms of species called transitional fossils. A transitional fossil is any fossil which gives us information about a transition from one species to another. A transition simply means that, down through time, there was some sort of adaptation. The adaptation must be big enough so that each species can be easily be sorted into either a "before the adaptation" pile, or a "after the adaptation" pile.

Transitional forms reveal links between different species. If two groups of creatures are similar, then a transitional creature would have looked like something part-way between each species.

One famous transitional fossil is Archeopteryx, an intermediate between reptiles and birds. The
classic fossil of *Archaeopteryx*, sometimes called the first bird, has a wishbone (fully fused clavicle) which is only found in modern birds. The fossil (an impression in a rock shown below right) also shows impressions from feathers on its body, leading one to believe it is a bird. Its body, capable of flight or gliding, also had many of dinosaur features — teeth (no birds alive today have teeth), a long bony tail (tails on modern birds are entirely feathers, no bones), long hind legs and toes, and a specialized hand with long bony fingers (unlike modern bird wings in which the fingers are fused into a single element).

**Evidence #2: Homologous Structures**

Scientists long ago began to compare the body structures of living species to look for clues about evolution. An organism’s **body structure** is its basic body plan, such as how its bones are arranged. Organisms have similarities in body structures when they are closely related. Homologous structures in different organisms prove they have a common ancestor species. For example, the forelimbs (arms) of vertebrate (organisms with a skeletal system) contain the same sets of bones organized in similar ways, even though they have different functions. Look closely at the bones in the human’s arm, bird’s wing, whale’s flipper, and dog’s leg shown above. Notice that the bones in the forelimbs of these three animals are arranged in a similar
way. These similarities provide evidence that these four organisms all evolved from a common ancestor. Similar structures that related species have inherits from a common ancestor are called homologous structures.

**Evidence #3: Vestigial Structures**

Various species, including humans, have numerous structural traits that are leftovers from our ancestors. Vestigial structures are remains of a structure that was functional in some ancestral species but is no longer functional in the organism in question. This was a neutral variation that never really disappeared because it did not cause the organism death. It continues to be passed on, even though it is no longer necessary. Baleen whales still have hipbones inside them proving they evolved from an older species that had legs.

![Diagram of whale skeleton](image)

In our ancestors, the appendix was used to digest plant fibers. As humans began cooking food, we did not need to digest plant fibers, so this organ shrunk to its current pinky-size. It proves we have evolved from an older species.

**Evidence #4: EMBRYO DEVELOPMENT**
Scientists can make inferences about evolutionary relationships by comparing the early development of different organisms. Embryos show what organisms look like before they are born. The embryos of many of today’s species temporarily have similar characteristics. These traits vanish in later development, but because our beginning development is so extremely similar to the beginning development of so many other organisms, the traits prove that we evolved from other species. Suppose you were asked to compare an adult turtle, a chicken, and a rabbit. You would probably say they look quite different from each other. However, during early development, these three organisms go through similar stages as you can see in the image below. For example, during the early stages of development all three organisms have a tail and tiny gill slits in their throats. These similarities suggest that these three vertebrate species are related and share a common ancestor. When scientists study early development more closely, they notice that the turtle appears more similar to the chicken that it does to the rabbit. This evidence supports the claim that turtles are more closely related to chicken than they are to rabbits.

Evidence #5: Adaptations & Natural Selection
**Natural Selection** states that only the organisms best adapted to their environment tend to survive. **Adaptations** are something an animal has or does that helps it survive its environment. To better survive in an environment, adaptations happen over time, to improve a species chance of survival. Organisms with traits that are favorable to their survival and reproduction are more likely to pass on their genes to the next generation. This is evolution on a smaller scale. Evolutionary change can happen in a few generations, but major change, such as speciation (when a whole new species is formed), often takes many thousands of generations.

Adaptations can take many forms: a behavior that allows better evasion of predators, a protein that functions better at body temperature, or an anatomical feature that allows the organism to access a valuable new resource — all of these might be adaptations. Many of the things that impress us most in nature are thought to be adaptations.

**Questions: All questions in CAF unless otherwise stated.**

1. **What is evolution:**

   ____________________________________________________________

   ____________________________________________________________

2. **What is a transitional fossil?**

   ____________________________________________________________

   ____________________________________________________________

3. **The famous transitional fossil, *Archaeopteryx*, was a species between a bird and a reptile. What characteristics did it have of a reptile (dinosaur)? (NO CAF)**

   ____________________________________________________________

   ____________________________________________________________

4. **What is a homologous structure?**

   ____________________________________________________________
5. What is a vestigial structure?

6. Give two examples of vestigial structures and explain why they are a vestigial structure.
   
a. 

b. 

7. What do an embryo turtle, chicken, and rabbit (and human) all have in common? (what characteristics do their embryo’s share)

8. Define natural selection (NO CAF):
9. Define adaptation (NO CAF):

10. Think of your favorite animal, and write down 2 adaptations (behavioral or physical) that you think that animal has to help them survive their environment (do not need evidence from text).
Directions: **RAQ!!!(Read, Annotate while you read, and then answer the Questions at the end).** When answering the questions at the end, make sure to go back and underline and number your evidence in the reading!!

**Kingdoms**

All living things in the world can be broken into 6 different categories based on their characteristics. These categories are called **kingdoms**. This week, it's not important to know the names of the kingdoms, or which organisms belong to each kingdom, but it is important to know which characteristics are used to break organisms up into these kingdoms. There are three characteristics that are used: presence of nucleus, source of food, and number of cells.

**Presence of Nucleus**

The **nucleus** (NOO klee us) (plural nuclei) is a dense area in a cell that contains the DNA – the chemical instructions that direct the cell's activities. The simplest types of cells were most likely the first organisms that formed on Earth. These organisms are called **prokaryotes** (proh KAR ee ohtz). All prokaryotic cells have a cell membrane surrounding the cell and cytoplasm (the jello-like fluid) within the cell. While these cells do have DNA, the DNA is suspended within the cytoplasm. It basically just floats around. It is not contained within a nucleus. Therefore, prokaryotes are organisms whose cells lack a nucleus.

The other, much more complex types of cells most likely formed later on in Earth's history. These organisms are called **eukaryotes** (yoo KAR ee ohtz). Like prokaryotic cells, eukaryotic cells have cell membranes and cytoplasm. However, there are many more organelles within the eukaryotic cell, including a nucleus! All eukaryotic cells contain a nucleus in which their DNA is stored.
The diagram shown below represents the difference between the cells of a eukaryote and a prokaryote. Notice that while DNA is present in both cells, a nucleus is only present in one of them.

Food Source

We previously learned that organisms need a source of energy in order to live. They use food as their energy source. Organisms differ in the ways they obtain their energy. Some organisms, such as plants, capture the sun’s energy and use it along with carbon dioxide, a gas found in Earth’s atmosphere, and water to make their own food. Organisms that make their own food are called autotrophs (AW tuh trawfs). The prefix auto- means “self” and the suffix –troph means “feeder.” Autotrophs use the food they make as an energy source to carry out their daily functions. All producers are autotrophs.

Organisms that cannot make their own food are called heterotrophs (HET uh roh trawfs). The prefix hetero- means “other.” A heterotroph’s energy source is also the sun – but in an indirect way. Heterotrophs either eat autotrophs and obtain the energy in the autotroph’s stored food, or they consume other heterotrophs that eat autotrophs. All consumers are heterotrophs. Heterotrophs that eat autotrophs ( producers) are primary consumers, whereas heterotrophs that eat other heterotrophs ( consumers) are
called secondary, tertiary, or quaternary consumers. Scavengers and decomposers are also heterotrophs since they rely on other organisms for food.

In the following food web, the carrots, grasses, and grains are all producers creating their own food. This makes them autotrophs. All the other organisms shown (the rabbits, foxes, mice, grasshopper, birds, and owl) are all consumers obtaining their food from other organisms. This makes the heterotrophs.
Organisms may be composed of one cell or of many cells. **Unicellular**, or single-celled organisms, are the most numerous organisms on Earth. One cell must carry out all of the functions necessary for the organism to stay alive. Since cells are so small, most unicellular are microscopic and cannot be seen by the naked eye. **Multicellular** organisms are composed of many cells. The cells of many multicellular organisms are specialized to do certain tasks. For example, humans are made of trillions of cells. Specialized cells in your body, such as muscle and nerve cells, work together to keep you alive. Nerve cells carry message from your surroundings to your brain. Other nerve cells then carry message to your muscle cells, making your body move.

**Questions:** Answer all questions using CAF and correct spelling and grammar. **Go back to the reading and underline the section of the reading (evidence) that helped you answer the question.** Put the number of the question next to the underlined section (evidence).

1. The categories that all living things in the world can be broken into based on their characteristics are known as ________________.

2. What are the three characteristics used to break up organisms into the kingdoms?
   a. ________________
   b. ________________
   c. ________________

3. Describe the difference between prokaryotes and eukaryotes. ________________

   ________________

   ________________

(4) Two cells are shown below. One is from a prokaryote and one is from a eukaryote. Label each one as either a prokaryotic cell or a eukaryotic cell. Then, explain how knew which was which. No evidence required.
(5) Describe the difference between autotrophs and heterotrophs. 

Use the following food web for questions 6 and 7. No evidence required.
(6) Circle the organism(s) in the food web that are autotrophs. Explain how you knew. No evidence. ____________________________________________________________

________________________________________________________________________

________________________________________________________________________

(7) Square the organism(s) in the food web that are heterotrophs. Explain how you knew. No evidence. ____________________________________________________________

________________________________________________________________________

________________________________________________________________________

(8) Describe the difference between unicellular and multicellular organisms. ____________________________________________________________

________________________________________________________________________

(9) An organism is described in each box below. Put a check in the box for each characteristic based on the organism description. *The first one has been completed for you as an example. NO EVIDENCE REQUIRED.*

<table>
<thead>
<tr>
<th>Organism Description</th>
<th>Presence of Nucleus</th>
<th>Food Source</th>
<th>Number of Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prokaryote</td>
<td>Eukaryote</td>
<td>Autotroph</td>
</tr>
<tr>
<td>a. This organism has a nucleus, is made of many cells, and produces its own food.</td>
<td></td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>b. This organism does not have a nucleus, is made of only one cell, and creates its own food.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. This organism is able to perform photosynthesis, but is made of only one cell. The cell</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. This organism has a nucleus, eats grass, and is composed of many cells.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. This organism has more than one cell, breaks down dead and decaying organisms, and its cells have an organelle that contains DNA.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. This organism does not have a nucleus, eats small organisms, and is composed of one cell.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6th Grade REVIEW #6
Living Things and CELLS!!

1. To be considered living, you must have 5 characteristics. Fill in the following chart to describe each of these characteristics of living things.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Respond to _______</td>
<td>All organisms _________ to changes in their environment.</td>
</tr>
<tr>
<td>b. Growth and ________</td>
<td>All organisms use energy in order _______ and develop.</td>
</tr>
<tr>
<td>c. Reproduction</td>
<td>All organisms are able to create _________.</td>
</tr>
<tr>
<td>d. Composed of ________</td>
<td>All organisms are made of small items called _________.</td>
</tr>
<tr>
<td>e. Obtain &amp; _______ Energy</td>
<td>All organisms must obtain and use _________ in order to help them function.</td>
</tr>
</tbody>
</table>

3. Match the stimulus with the response:

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>_______ The sun comes up in the morning</td>
<td>a. A bird tweets/signs to alert others</td>
</tr>
<tr>
<td>_______ An owl is hungry</td>
<td>b. An organism hunts for food</td>
</tr>
<tr>
<td>_______ The temperature dips to -5°F</td>
<td>c. A plant opens its leaves/petals</td>
</tr>
<tr>
<td>_______ A loud noise rings through the forest</td>
<td>d. A fox curls its tail around its body</td>
</tr>
</tbody>
</table>

4. There are many commonly held beliefs about living things. Mark if the beliefs are TRUE or FALSE.
Use the five characteristics listed in #2 to help you!!

| _____ a. All organisms have blood       | _____ e. All organisms need oxygen          |
| _____ b. All organisms need water      | _____ f. All organisms are made of cells    |
| _____ c. All organisms create babies   | _____ g. All organisms are composed of      |
| _____ d. All organisms can move/respond in some way | _____ h. All organisms require energy     |
5. All organisms are composed of cells. Within cells are small structures that help them function known as organelles. (Similar to how within our bodies, there are smaller structures that help us function that are known as organs.)

What are organelles?

6. Important organelles: There are about six organelles that are present in almost every cell that exists in the world. The nucleus is the largest organelle which contains the DNA. Since DNA is the blueprint for our bodies, the nucleus is in charge of creating the recipe that the rest of our cells follow to make YOU, YOU! DNA is the genetic material that is contained within the nucleus. Everybody has specific DNA. The mitochondria is the “power house” of the cell. The mitochondria is responsible for creating ATP, or energy, animals do this by breaking down food, and plants do this through photosynthesis. The following six organelles are present in almost every cell that exists in the world. You must know them!

<table>
<thead>
<tr>
<th>Organelle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Nucleus</td>
<td>The largest organelle which contains the __________________________________.</td>
</tr>
<tr>
<td>b. ______________</td>
<td>The genetic material contained within the nucleus.</td>
</tr>
<tr>
<td>c. Cytoplasm</td>
<td>The ________-like ____________ in the rest of the cell.</td>
</tr>
<tr>
<td>d. ______________</td>
<td>Turns food into energy.</td>
</tr>
<tr>
<td>e. ______________</td>
<td>The outer-most layer of the cell which protects it and determine what can enter/________.</td>
</tr>
<tr>
<td>f. Vacuole</td>
<td>A __________ that stores __________ and __________.</td>
</tr>
</tbody>
</table>
7. Draw a sketch of a cell, and label the 6 organelles from #6.

8. Some types of cells are able to complete a process called photosynthesis. What is photosynthesis? 

9. What are the three materials needed for photosynthesis to take place?
   
10. What are the two substances created by photosynthesis?

11. Identify the organelle in which photosynthesis takes place. 

12. Which types of organisms have the special organelle identified in #11? Circle one:

<table>
<thead>
<tr>
<th>Producers</th>
<th>Consumers</th>
<th>Scavengers</th>
<th>Decomposers</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Plants/Algae)</td>
<td>(Humans/Birds)</td>
<td>(Vultures)</td>
<td>(Fungi/Bacteria/Worms)</td>
</tr>
</tbody>
</table>
13. The groups of organisms you identified in #12 have two other unique organelles. What are they?

<table>
<thead>
<tr>
<th>Organelle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Rigid, protective outer layer of cell. Surrounds the cell membrane. Assists in providing structure and support to the cell.</td>
</tr>
<tr>
<td>b.</td>
<td>Although existing in all cells, it is very large in the cells of these organisms. It needs to be large in order to store the large amounts of water required for photosynthesis to take place. When empty, a plant will wilt.</td>
</tr>
</tbody>
</table>

14. Label the organelles in each of the following cells.

![Cell Diagram]

15. Referring to the cell diagrams in #14, which represents an animal (consumer) cell and which represents a plant (producer) cell? Describe how you know.

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