

# Who Do Cells Get Energy?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Energy

- We have learned how the \_\_\_\_\_ of a cell work together to carry out life functions.
- Many cells specialize in the jobs they perform, but there is one thing they all need – \_\_\_\_\_.
- As a member of the \_\_\_\_\_ kingdom, you know that you eat and digest food for energy.
- Most \_\_\_\_\_ don't get their energy in this way.

## How Plant Cells Make Food

- The energy source for cells is the \_\_\_\_\_.
- Green plants and some other organisms can capture the \_\_\_\_\_ in the Sun's light.

## How Plant Cells Make Food: Needs for Photosynthesis

- \_\_\_\_\_ is the process by which plants make food.
  - The word *photosynthesis* means "putting together with \_\_\_\_\_".
- This process occurs in
  - green \_\_\_\_\_
  - in \_\_\_\_\_
  - in certain kinds of \_\_\_\_\_
- Photosynthesis requires:
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- \_\_\_\_\_ is pigment that traps light during photosynthesis.
- The energy from sunlight is used to power reactions that combine water from the soil and carbon dioxide from the air to make a simple sugar called \_\_\_\_\_.
- A by-product of the photosynthesis reaction is \_\_\_\_\_.
- \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ + \_\_\_\_\_
- Where do the carbon dioxide and water come from?
  - Carbon dioxide comes from the \_\_\_\_\_ and water comes from the \_\_\_\_\_.

- What is the role of the Sun in this reaction?
  - Sun provides the energy to power the \_\_\_\_\_ reaction.
- Why can a plant make food and not you?
  - Plants have \_\_\_\_\_

#### How Plant Cells Make Food: Role of the Leaf

- A leaf is composed of different \_\_\_\_\_.
- Most photosynthesis takes place inside \_\_\_\_\_ and green \_\_\_\_\_.
- The bottom of a leaf contains tiny \_\_\_\_\_ that open and close to allow carbon dioxide to enter and oxygen and water vapor to leave the leaf.
- The leaf \_\_\_\_\_ support the leaf and transport substances to various parts of the plant.

#### How Plant Cells Make Food: Steps in Photosynthesis

- There are two reactions in photosynthesis
  - \_\_\_\_\_ Reaction – which happens during the \_\_\_\_\_
  - \_\_\_\_\_ Reaction – which can happen in the day or \_\_\_\_\_
- These reactions are \_\_\_\_\_ on each other.
- Each generates a special energy molecule – \_\_\_\_\_ or \_\_\_\_\_ – that is used to keep the other running.
- Light Reactions
  - Occur in the \_\_\_\_\_, which are found inside the chloroplast.
  - Require \_\_\_\_\_ (adenosine diphosphate) molecules to change from light energy into chemical energy.
  - Store the energy produced in \_\_\_\_\_ (adenosine triphosphate) molecules.
- Dark Reactions
  - Occur in the \_\_\_\_\_.
  - Require \_\_\_\_\_ and energy from ATP to form glucose.
  - Form more ADP to supply the \_\_\_\_\_ reactions.

#### Cell Respiration

- At \_\_\_\_\_, the light reaction of photosynthesis shuts down.
- However, the \_\_\_\_\_ of nutrients into cells, removal of wastes from cells, building of new cell parts, and other functions do not stop because it is dark.

- \_\_\_\_\_ is still needed to carry on these life processes.
- The chemical energy stored during photosynthesis is made accessible for use by the cell through \_\_\_\_\_.
- Cell respiration involves processes with and without \_\_\_\_\_.

#### Cell Respiration: Glycolysis

- \_\_\_\_\_ is a process that breaks down glucose molecules.
- It occurs in the \_\_\_\_\_.
- It \_\_\_\_\_ require oxygen.
- The process yields pyruvate and a small amount of \_\_\_\_\_ molecules.
  - \_\_\_\_\_ is a type of acid necessary to convert sugar to energy.

#### Cell Respiration: Aerobic Respiration

- Aerobic respiration occurs in the \_\_\_\_\_.
- \_\_\_\_\_ is required for this process.
- The \_\_\_\_\_ made during glycolysis enters the mitochondria.
- This process yields many \_\_\_\_\_ molecules.

#### Cell Respiration: Fermentation

- \_\_\_\_\_ is a type of anaerobic respiration, a process that does not require oxygen.
- Pyruvate is converted into \_\_\_\_\_, carbon dioxide, and either lactic acid or alcohol. A small amount of ATP molecules is produced.
- \_\_\_\_\_ is mainly produced in muscles and can be used as a source of energy. It is also used in food making.
- Fermentation by \_\_\_\_\_ is important in baking bread and making wine.

#### Photosynthesis and Cell Respiration are Related

- You can see \_\_\_\_\_ in the two processes that maintain life on Earth: photosynthesis and cell respiration.
- Photosynthesis \_\_\_\_\_ the molecule that provides the energy for life.
- Cell Respiration breaks this molecule \_\_\_\_\_ to meet the cell's current energy needs.
- Nearly every creature on Earth uses the \_\_\_\_\_, or chemical energy, produced through photosynthesis by plant cells.
- Both plant and animal cells use the \_\_\_\_\_ that plants give off during photosynthesis for cell respiration.

- Photosynthesis and cell respiration go \_\_\_\_\_.
- They involve the same basic chemical materials:
  - Carbon Dioxide
  - \_\_\_\_\_
  - \_\_\_\_\_
  - ATP
  - ADP
  - \_\_\_\_\_
- Each reaction yields the \_\_\_\_\_ result of the other.
- Photosynthesis and cell respiration are \_\_\_\_\_.
- One stores energy from the \_\_\_\_\_ in the form of sugars to be used later by cells.
- The other converts the \_\_\_\_\_ sugars into energy for immediate use by the cells.