

Introduction to Photosynthesis

Read the following introduction to photosynthesis and answer the questions that follow:

Photosynthesis is the way plants, algae, and some bacteria make their own food from sunlight, water, and air. This process is essential for life on Earth, as it provides energy and organic compounds for the food chain.

1. What is the main purpose of photosynthesis?

2. What are the three main components necessary for photosynthesis?

Essential Ingredients for Photosynthesis

Match the following words with their definitions:

1. Photosynthesis
2. Chlorophyll
3. Glucose
4. Oxygen
5. Carbon Dioxide

Definitions:

- The process by which plants make their own food
- A green pigment that captures light energy
- A type of sugar produced during photosynthesis
- A gas released into the air during photosynthesis
- A gas necessary for photosynthesis

How Do These Ingredients Work Together?

Read the following passage and answer the questions that follow:

During photosynthesis, light energy is absorbed by chlorophyll and converted into chemical energy. This energy is then used to convert carbon dioxide and water into glucose and oxygen. The equation for photosynthesis is: $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 \text{ (glucose)} + 6\text{O}_2$

1. What is the role of chlorophyll in photosynthesis?

2. What is the equation for photosynthesis?

Activity 1: Matching Game

Match the following words with their definitions:


1. Photosynthesis
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4. Oxygen
5. Carbon Dioxide

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Activity 2: Diagram Labeling

Label the following diagram of a plant cell:

 Plant Cell Diagram

1. Chloroplast
2. Nucleus
3. Cell Wall
4. Mitochondria

Activity 3: Short Answer Questions

Answer the following questions:

1. What is the main source of energy for photosynthesis?

2. What is the role of water in photosynthesis?

3. What is the by-product of photosynthesis that is released into the air?

Activity 4: Case Study

Read the following case study and answer the questions that follow:

Coral reefs are home to many photosynthetic organisms, including algae and sea grasses. These organisms undergo photosynthesis to produce glucose and oxygen. However, climate change is affecting the health of coral reefs, which can impact the photosynthetic processes of these organisms.

1. What are the photosynthetic organisms mentioned in the case study?

2. How does climate change affect the photosynthetic processes of these organisms?

Conclusion

Summarize what you have learned about photosynthesis:

Assessment

Complete the following assessment tasks:

1. Completed matching game
2. Labeled diagram of a plant cell
3. Short answer questions
4. Case study

Extension

Choose one of the following extension tasks:

1. Research and write about a specific type of plant or organism that undergoes photosynthesis in a unique way.
2. Design an experiment to investigate the effect of light intensity on photosynthesis.
3. Create a model of a plant cell and explain the function of each part.

