Worksheet 1: "Processes and Functions"

Objective: Understand the processes of nitrogen absorption and photosynthesis and identify their key functions.

Instructions:

1. Review the concepts of nitrogen absorption and photosynthesis.
2. Complete the sentences below with the appropriate terms or phrases.

a. Plants absorb nitrogen in the form of nitrates: This process helps plants in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

b. Nitrogen fixation: This process transforms atmospheric nitrogen into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

c. Photosynthesis: During photosynthesis, plants create \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from carbon dioxide, water, and light.

Word Bank:

* Nutrient absorption
* Sugars
* Oxygen
* Nitrates
* Atmospheric nitrogen
* Energy
* Carbon dioxide
* Water
* Growth
* Nitrogen fixation
* Photosynthesis

For Teachers:

*Correct Answers:*

*a. Plants absorb nitrogen in the form of nitrates: This process helps plants in nutrient absorption.*

*b. Nitrogen fixation: This process transforms atmospheric nitrogen into nitrates.*

*c. Photosynthesis: During photosynthesis, plants create sugars and oxygen from carbon dioxide, water, and light.*

Worksheet 2: "Visualizing Nitrogen in Rain and Photosynthesis"

Objective: Create visual representations to illustrate the concepts of nitrogen absorption and photosynthesis.

Instructions:

1. Choose two concepts from the video (e.g., Nitrogen fixation, Photosynthesis, etc.)
2. Create a visual representation for each concept using drawings or diagrams.
3. Include captions or brief descriptions for each illustration, explaining the key steps or processes involved in nitrogen absorption and photosynthesis.

Example Visual Representations:

Illustration 1: Plants Absorb Nitrogen

* Show a plant absorbing nitrogen in the form of nitrates from the soil.
* Caption: "Plants absorb nitrogen from the soil to support their growth."

Illustration 2: Nitrogen Fixation

* Depict the process of nitrogen fixation, transforming atmospheric nitrogen into nitrates.
* Caption: "Nitrogen fixation converts atmospheric nitrogen into a usable form for plants."
* Illustration 3: Photosynthesis

For Teachers: *Encourage students to be creative in their visual representations and to clearly convey the processes and functions associated with nitrogen absorption and photosynthesis.*

Hands-On Experiment: "Nitrogen in Rain and Photosynthesis"

Objective: Explore the concepts of nitrogen absorption and photosynthesis through a hands-on activity.

For Teachers: *Instructions:*

1. *Divide the class into small groups.*
2. *Provide each group with the following materials:*
   1. *Pots or containers with soil*
   2. *Seeds (e.g., bean seeds)*
   3. *Water*
   4. *Nitrogen-rich fertilizer (optional)*
   5. *Sunlight source or grow lights*
   6. *Markers and paper*
3. *Explain the activity to the students:*

*a. Nitrogen Absorption:*

* *Plant seeds in the pots or containers.*
* *Water the plants regularly and discuss the importance of water for nutrient absorption.*
* *Optionally, use nitrogen-rich fertilizer for one set of plants and observe any differences.*

*b. Photosynthesis:*

* *Discuss the role of sunlight in photosynthesis*
* *Place some plants in direct sunlight and others under grow lights*
* *Observe and record any differences in growth and health*
* *In their groups, students should document their observations and findings on paper*
* *Include drawings, measurements, and any changes observed over time.*
* *After the activity (~2 weeks), reconvene as a class and have each group share their findings.*
* *Discuss the connections between the hands-on activity and the concepts covered in the video.*

\*\*More on this experiment below:

The duration of the hands-on activity can vary based on the specific plants chosen and the conditions provided. However, here's a suggested timeline for the activity:

Day 1: Introduction and Planting

* Introduce the activity, explain the concepts of nitrogen absorption and photosynthesis, and provide instructions.
* Have students plant the seeds in pots or containers with soil.
* If using nitrogen-rich fertilizer, apply it as directed.

Days 2-5: Observation and Watering

* Instruct students to observe and document the growth of their plants daily.
* Emphasize the importance of regular watering and maintaining consistent conditions.
* Encourage students to measure the height of the plants, observe leaf development, and note any changes.

Days 6-10: Continued Observation and Data Collection

* Continue daily observations and measurements.
* Discuss any noticeable differences between the plants exposed to different conditions (e.g., nitrogen-rich fertilizer, sunlight exposure).

Day 11: Group Discussions and Analysis

* Have groups share their findings, including observations, measurements, and any challenges faced.
* Facilitate a class discussion on the connections between the hands-on activity and the concepts of nitrogen absorption and photosynthesis.

Discussion Questions:

1. How did the plants respond to different conditions (e.g., nitrogen-rich fertilizer, sunlight exposure)?
2. What role does water play in the absorption of nutrients by plants?
3. How does the hands-on activity relate to the concepts of nitrogen absorption and photosynthesis discussed in the video?
4. This hands-on activity allows students to directly observe and interact with the processes of nitrogen absorption and photosynthesis, reinforcing their understanding of these concepts.