5E Science Lesson Plan

**Big Idea:** Plant structures and functions

**Objectives:** At the conclusion of this lesson, students will be able to:

1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
2. Identify the internal and external structures of a plant of their choice.
3. Identify the plant structure’s specific functions.

**Standards:** NGSS4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin. \*\*Each structure has specific functions within its associated system.]

I.  Formation of Groups: Students will be working with their table group.

II. Role Assignments:  Beginning with the Materials Manager all roles are assigned to the right (clockwise).

 Materials Manager: This person is responsible for collecting, dispersing and returning all materials (handouts, iPads/chromebooks).

Encourager: Will routinely encourage and praise students’ hard work. The encourager will also motivate the group’s work ethic and progress on the project.

Checker/Timekeeper: Will hold the timer and keep track of how much time is left to complete the activity. This person also makes certain all tasks are carried out correctly, answers team questions and seeks out assistance when team requests it.

Recorder: This person will record the group’s findings during the research phase.

Observer/Reporter: This person will report the findings of the team.

Traveler/Spy: This person can “travel” around the classroom and see what the other groups are doing.

III. Task:

**Engagement**:  The teacher will bring in a rose (in a water tube). Pass the rose around to each group and allow students to make observations. Within their group, students will discuss what kinds of structures the rose has. (The rose has thorns, colored petals, leaves, etc.) Each group will have a graphic organizer on which to record their findings.

**Exploration**: Record what kinds of structures have they noticed in the rose and their hypothesis for what each structure is used for. Groups will include an illustration to accompany their findings.

**Explanation**: Groups will infer and record their explanations about how the structures either: help the rose grow, survive, or reproduce. Students will share their explanations with their table group. As they share, the teacher will walk around and listen to their discussions. After five minutes of discussion, a student from each table will share their explanation with the whole class.

After their inferences and ideas have been expressed, the teacher will define what each structure of the rose is called and what the function of each structure is. The teacher will describe how the rose’s structures support its survival, growth, behavior, and reproduction.

**Elaboration**: Students will elaborate on previously practiced skills by researching (as a group) the structures and functions of a plant of the group’s choosing, given the options provided by the teacher: corn plant, sunflower, Venus flytrap, ivy, bird of paradise, or cactus. Students will create a diagram of the plant, including its structures, the functions of the structures, and how they support the plant's survival, growth, behavior, and reproduction. This will be displayed in a PowerPoint presentation that will be presented to the class at a later date.

**Evaluation:** Students will use a peer assessment checklist to assess each other. They will also be provided with a self-assessment rubric.

IV. Time Limit:

Engagement: 5 minutes

Exploration: 10 minutes

Explanation: 15 minutes

Elaboration: 35 minutes

Evaluation: 5 minutes

Total: 70 minutes

V. Social Skills and or Habits of Mind to Engage/Assess:  Attentive Listening; Disagree with Idea- Not the Person; Flexibility in Thinking; Perseverance; Team Work

VI  Level of Voice:

Classroom Level 0- Silent Voice No Talking (During teacher instruction)

Classroom Level 2 – Normal Voice Table Talk (During discussion and group work)

VII. Processing--Questions for team and individual reflection:

What does an organism need to live?

How do structures keep an organism alive?

How can we infer the function that a structure serves?

VIII. Assessment of Cooperation/Collaboration:

Peer Assessment “Rate Your Mates”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Group Member Name** | **Encouraging** | **Attentive Listening** | **Working Toward Consensus** | **Staying on task and with the group** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Scoring Key: Never=N  Sometimes=S Frequently=F

Self Assessment Collaborative Activity Performance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Evaluation Criteria:** | **4** | **3** | **2** | **1** |
| **Structure of the plant** | Clearly and completely identified the structure of the plant. Included the major and minor structures.  | Clearly and completely identified the structure of the plant. Included the major structures.  | Identified 1-2 parts of the structure of the plant.  | Identified 0-1 parts of the structure of the plant.  |
| **Function of each structure**  | Clearly and completely identified the function of each structure. Included the major and minor functions. | Clearly and completely identified the function of each structure. Included the major functions. | Identified 1-2 functions of the structures. | Identified 0-1 functions of the structure. |
| **Survival, growth, behavior, reproduction** | Explained how the plant’s structures and functions support survival, growth, behavior, and reproduction.  | Explained how the plant’s structures and functions support only three of the descriptions.  | Explained how the plant’s structures and functions support only two of the descriptions.  | Explained how the plant’s structures and functions support only one or zero of the descriptions.  |

VIII. Encouraging Energizer: Team selects from these three: microwaves, WOW, or sprinklers.

Graphic Organizer Example

|  |  |  |  |
| --- | --- | --- | --- |
| **Structure** | **Use** | **Purpose** | **How** |
| thorn | survival | wards off animals | harms things that touch it |
| leaves | survival | gives plant nourishment | photosynthesis |
| rose hip | reproduction | spreads seeds | animals eat the hips and spread flowers through dung |