LESSON PLANS

MODULE TOPIC:

COMMUNICATION & PERMEABILITY

Lesson 1: Communication and Documentation in Science

RATIONALE:
Communication is essential in the process of science for growth and development.

STANDARD(S) & INDICATOR(S) (NJCCCS - 2009):
5.1.12.D.1 Engage in multiple forms of discussion in order to process, make sense of, and learn from others’ ideas, observations, and experiences.
5.1.12.D.2 Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.

OBJECTIVE(S):
Students will be able to:
- Construct a device or object from materials given by the teacher.
- Describe the construction of the device or object so that other students will be able to construct that product.

MATERIALS:
- Notebook & pen
- Bag of assorted materials (clay, string, toothpicks, bolts, screws...)

LIST OF HANDOUTS (attach original copies of each handout - teacher & student edition)
See Parameters to Evaluate Student Work Products.

BACKGROUND INFORMATION:
Communication and documentation is used in research. Students are to develop a sense on proper communication used within the scientific community.

CLASSROOM ACTIVITY DESCRIPTION (LABORATORY/EXERCISES/PROBLEMS) including detailed procedures:
- Each team will be given a bag of materials to be used for construction
- Teams are to document how they made their construction
- Teams will exchange directions on how to make their respective construction
- Teams will try to recreate the construction of the other team.
- Peer review of instructions by classmates.

SAMPLE QUESTIONS TO ELICIT CLASS DISCUSSION:
- Why is proper communication important in science?
HOMEWORK ACTIVITY/EXERCISES/PROBLEMS:
Students will read about the methods of science in the textbook prior to the activity.

PARAMETERS TO EVALUATE STUDENT WORK PRODUCTS:
- Through reflective writing, students evaluate their own instructions to see how they might have conveyed the construction directions more effectively.
- Students construct a device or object using the instructions provided to them by their classmates.

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TOTAL POINTS OUT OF 5

REFERENCES:
LESSON 2: SOIL PROPERTY TESTING

RATIONALE:
To incorporate sieving done in the lab into the classroom

STANDARD(S) & INDICATOR(S):
5.1.12.B.1, Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.

OBJECTIVE(S):
Students will be able to:
Compare and contrast wet soil samples and dry soil samples.
Create a filtering system and measure the rate of flow of water through each soil sample.

MATERIALS:
- Soil samples
- Paper cups, cheese cloth, rubber bands, filters, strainers, paper towels
- Funnels
- Clear cups, paper plates
- Journal, pen, markers
- Microscope and slides
- Graduated cylinder
- Water

BACKGROUND INFORMATION:
Filtering (sieving) is a common process used in pharmaceutical manufacturing to separate materials of varying sizes.

CLASSROOM ACTIVITY DESCRIPTION (LABORATORY/EXERCISES/PROBLEMS) including detailed procedures:
- Students will document their observations of the soil samples when they are dry & wet
- Students will create a filtering system with the materials provided to determine the rate of water flow through the soil sample
- Students will be given an unknown to identify based on its characteristic and filtering rate

SAMPLE QUESTIONS TO ELICIT CLASS DISCUSSION:
- How might you have designed the experiment differently?
- How might this experiment be applicable to real world issues?

HOMEWORK ACTIVITY/EXERCISES/PROBLEMS:
Students will read the chapter section pertaining to soil.
PARAMETERS TO EVALUATE STUDENT WORK PRODUCTS:

- Written description of differences and similarities of wet and dry soil samples.
- Prepare tables for data and analysis of data to determine flow rates.
- Description of effectiveness of filtration system.
- Identification of unknown.

REFERENCES:

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