

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.

PARAMETER	POINT VALUE
DATE	1
NAME	1
TITLE/LABELING	1
LEGIBILITY	1
CLEAR INSTRUCTION	1
	TOTAL POINTS OUT OF 5

REFERENCES:

Textbook: Pearson Environmental Science, by Withgott.

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:

Textbook: Pearson Environmental Science, by Withgott.

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