Lab Framework

Text:Cord

Unit number and title: Unit 14- Solving problems with Powers and roots

  Short Description: Students will calculate uncontrolled growth in various forms

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Lab Title
The power[s] that be

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

    Students will calculate the growth rates of exponential functions

    Students will understand how rare totally unchecked growth is in nature.

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

    Understanding of how powers can be used to describe a system.

    Competence writing formulas to describe problems

    Understanding how to operate calculator

    Reading measuring tools

- **Vocabulary**

    Exponential growth, checks and balances, carrying capacity, doubling rate.

- **Materials List**

    Pennies

    Calculators

    Petrie Dish with Alar growth media for incubation.

- **GLEs (State Standards) addressed**

    Math: 1.1.1, 1.1.6., 1.1.7

    Reading: 3.2.2

    Writing: 3.3.3

- **Leadership Skills**

- **SCAN Skills/Workplace Skills**

    Problem solving

- **Set-up information**

    Take sample 2-3 days prior for Alar growth

    Talk about topics in Biology that relate to this lab.

- **Teacher Assessment of student learning** (scoring guide, rubric)

    Lab participation, and completion of worksheet of lab data.

- **Summary of learning** (to be finished after student completes lab)

    -discuss real world application of learning from lab

    -opportunity for students to share/present learning

    -sources of possible errors in data collection process

    -implication to students as individuals and group

- **Career Applications**

Washington Applied Math Council

https://wa-appliedmath.org/

LAB TITLE: The Powers that be
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
    What does unchecked growth look like, and how can we make predictions?

- **Grouping instructions and roles**
    Students will work individually after initial collection of measurements

- **Procedures** – steps to follow/instructions
    Two days prior to lab, prepare alar petrie dish. Select student to sample.
    Students will get briefing at start of lab about how to use measurement tools and what data we are looking for.
    Teacher will demonstrate how to work a problem such as the classic doubling of pay every day.
    Students will examine cultured petrie dish and see what grew.
    Students will come together as small groups and determine how to apply a formula using exponents to this problem.
    Worksheet will be produced showing growth of a sample over one week with a doubling rate every six hours.

- **Outcome instructions**
    Teacher will monitor groups to assure that sensitive/politically incorrect discussions don't get out of control.

- **Assessment instructions** (peer-teacher)
    Teacher will assess lab sheet to evaluate student understanding of how to apply exponents to real world problem.

* **Post lab Discussion**
    Teacher will facilitate discussion of what might control unchecked growth and provide some real world examples of both successful and unsuccessful controls.

Lab Data Collection

Student: _____ **Date:** _____

Unit: 14- Solving problems with powers and roots_

Lab Title: The powers that be

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

Calculations: Complete the given calculations to solve for an answer(s)

Summary Statement:

Other Assessment(s)