Lab Framework

Text: Cord #14

Unit number and title: 14 Solving Problems with Powers and Roots

Short Description: In this lab students will work with exponents. They will see how quickly the number grows when it is doubled.

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Lab Activity
Exponents

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**
  To help students visualize how exponents can quickly increase the size of a number.
- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)
  Problem solving, use of calculator. Have understanding that 5^2 is 5 x 5 or 25
- **Vocabulary**
  Base, Exponent, Power, Root
- **Materials List**
  Notebook paper, pencil
- **State Standards addressed**
  Math: 1.5.1. Apply processes that use repeated addition or repeated multiplication
  2.2.2. Apply mathematical tools to solve the problem.
  5.3 Relate mathematical concepts and procedures to real-world situations
  Reading: 1.2 Use vocabulary strategies to comprehend text.
  1.2.1 Demonstrate evidence of reading comprehension
  Writing: 1.2 Use style appropriate to the audience and purpose, use voice, word choice, and sentence fluency to interpret.
- **Leadership Skills**
  1.4 Students will be involved in activities that require applying theory, problem solving, and using creative and critical thinking skills while understand outcomes of related decisions.
- **SCAN Skills/Workplace Skills**
  1.2 The student will demonstrate the ability to acquire information
  1.3 The student will demonstrate an understanding of complex-inter-relationships
- **Set-up information**
  Each student needs a ruler, piece of paper and pencil
- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required)**
  Students will take a single sheet of paper and divide it into thirty squares. They will use the doubling method to see how quickly the number grows.
- **Teacher Assessment of student learning** (scoring guide, rubric)
  Students will be assessed on participation and finishing lab questions.

- **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
  Students will understand how exponents allow us to display large numbers that are recognizable. They will be able to relate exponential numbers with money and how interest compounds and makes it grow.

- **Optional activities**

- **Career Applications**
  Problem solving and math calculations

LAB TITLE:_____
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

- **Grouping instructions and roles**
  Students are to take out sheet of notebook paper and ruler and divide paper into 30 squares.

- **Procedures** – steps to follow/instructions
  1. Divide paper into thirty squares
  2. Students then will start with one tally mark in square one.
  3. Move to square two and double square one
  4. Move to square three and double two, etc.
  5. Complete this process until all squares have been doubled. What is the number.
  6. Take calculator and figure the square root for this problem.
  7. To conclude lab, students will answer questions on lab assessment.

- **Outcome instructions**

- **Assessment instructions** (peer-teacher)

Lab Conclusion

Student: _____ **Date:** _____

Unit: _____

Lab Title: Factoring

Criteria: Write the problem/objective in statement form
The students will only go so far and give up because of the huge difference in each square when doubled. By time they have reached square ten their number is 16,384.

Data Collection: Record the collected/given data:
Have students take calculator to finish doubling all squares to determine the numbers of each square when doubled.

Calculations: Complete the given calculations to solve for an answer.
Have students take number and divide by 100. If the original number was in pennies by converting those pennies into $1 (100) what would their earnings be on
Day 10? _____
Day 20? _____
Day 30? _____