Lab Framework

Text: Algebra I

Unit number and title: Lesson 7.6 Standard Deviation

Short Description: Uses Excel to produce Standard Deviation (Measure of Dispersion)

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Lab Title

Using Technology to Calculate Standard Deviation

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

  Find the variance of a set of data.
  Calculate standard deviation for the set of data.
  Read data from a normal curve.
  Estimate the area under a curve.

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

  Basic Excel skills

- **Vocabulary**

  Variance: A measure of dispersion.
  Standard Deviation: The square root of the variance of a set of data.
  Normal Curve: A curve that represents a common distribution of data. Also known as a bell curve.

- **Materials List**

  Excel Spreadsheet

- **GLEs (State Standards) addressed**

  Math: 1.1.1.Understand and apply concepts and procedures from number sense—number and numeration; computation; estimation.

  1.1.4.Understand and apply concepts and procedures from probability and statistics—probability; statistics.

  2.2.2.Construct solutions—select and use relevant information; apply appropriate strategies and procedures; determine a solution that is viable and mathematically correct.

  3.3.1.Analyze information—analyze and compare mathematical information.

  3.3.3.Verify results—justify results; check for reasonableness of results; validate thinking.

  5.5.2.Relate mathematical concepts and procedures to other disciplines—identify and use mathematical patterns, thinking, and modeling in other subject areas; describe examples of contributions to the development of mathematics.

  5.5.3.Relate mathematical concepts and procedures to real-world situations—understand how mathematics is used in everyday life and in career settings.

  Reading: 3.2 Read to perform a task.
  Writing: 3.3 Knows and applies writing conventions

appropriate for the grade level.

- **Leadership Skills**

  1.4 The student will be involved in activities that require applying theory, problem-solve, and use critical and creative thinking skills while understanding outcomes of related decisions.

- **SCAN Skills/Workplace Skills**

Basic Skills

  - A. Locates, understands, and interprets written information and documents including manuals, graphs and schedules – to perform tasks
  - B. Identifies relevant details, facts and specifications

- **Writing**
  - A. Communicates thoughts, ideas, information, and messages in writing
  - B. Records information completely and accurately
- **Arithmetic**
  - A. Performs basic computations
  - B. Uses basic numerical concepts such as whole numbers and percentages in practical situations.
  - C. Approaches practical problems by choosing appropriately from a variety of mathematical techniques.
  - D. Uses quantitative data to construct logical explanations for real world situations
- **Listening**
  - A. Receives, attends to, interprets, and responds to verbal messages and other cues such as body language in ways that are appropriate to the purpose
  - B. For example, to comprehend
  - C. To learn
- **Reasoning**
  - A. For example, uses logic to draw conclusions from available information, extracts rules or principles from a set objects or written text
  - B. Applies rules and principles to a new situation, or determines which conclusions are correct when given a set of facts and a set of conclusions

- **Set-up information**

  Speadsheet to contain large data set. Data set will be in random order.

- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations; -**Timeline required)**

  1Class Period (55 Minutes)- Students will act independently. They will make their own calculations and decisions about the data.

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

  Successful completion of the task and completed worksheet.

- **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

- **Optional activities**

- **Career Applications**

Prompt students for career choices that involve standard deviation.
Weather Person
Chemical Technician
Quality Control Technician
Mico Chip Manufacturer
Marketing Surveys

LAB TITLE: Standard Deviation
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
  Calculate Standard Deviation for a large data set.

- **Grouping instructions and roles**
  Each student will do the activity by themselves.

- **Procedures** – steps to follow/instructions
  Place your answers on the data sheet provided.

- **Outcome instructions**
  Calculate the standard deviation for the data set. Use the Excel formula for standard deviation. Create a chart/illustration that illustrates values for the bell curve.

- **Assessment instructions** (peer-teacher)
  Students receive points based on a completed lab.

Lab Data Collection

Student: _____ Date: _____

Unit: _____

Lab Title:

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)

Data Set	
172	188
206	170
188	213
214	203
176	186
222	184
187	211
193	177
202	175
187	174
169	208
212	190
202	216
185	178
183	224
210	189
176	195
174	204
173	189
207	171
189	214
215	204
177	187
223	185
188	212
194	178
203	176
175	189
174	190
208	208