Calculating the Mean, Median, Mode, and Range of a Set of Numerical Data lesson plan

Lesson Overview

Topic	Lesson Information
Lesson Title:	Calculating the Mean, Median, Mode, and Range of a Set of Numerical Data
Lesson Author:	Sue Wilt
Date Created:	May 19, 2022
Lesson Timeframe:	60-90 minutes Lesson Slides and assessment: 60 minutes Optional Student Designed Statistics Project: 30 minutes
Content Area(s):	Math
General Topics/Skills Covered:	Measurement & Data; Statistics
NRS Level(s):	ABE 3
Prerequisite Skills:	Students must be able to perform basic mathematical operations (addition, subtraction, multiplication, and division) and understand that due to the variability and volume of data that exists for different applications, there is a need to summarize the data, using different calculations for different purposes

PA Foundation Skills

Standards / Skills	Standards and Skills Addressed in the Lesson
College and Career Readiness Standards (CCRS):	6SP.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers 6SP.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. 6SP.3 Recognize that a measure of center for a numerical

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	data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. 6SP.4 Summarize and describe distributions.
English Language Proficiency Standards (ELPS) (if applicable):	N/A
Standards for Mathematical Practice (if applicable):	MP2: Reason abstractly and quantitatively MP4: Model with Mathematics MP6: Attend to precision
Transferable Skills:	Applies Mathematical Operations, Concepts, and Reasoning FSF Skill Competency W5.5 Applies Math Concepts to Understand and Solve Problems Competency Benchmark: Interprets basic statistical data (e.g. mean, median, mode …) Domain: Measurement and Data Standard: Represent and interpret data… Level A Domain: Statistics and Probability Standard: Develop understanding of statistical variability… Level C Standard: Summarize and describe distributions … Level D Standard: Summarize, represent, and interpret data on a single count or measurable variable … Level E
Digital Literacy Skills:	Skills practiced: - Clicking on links to access documents in various formats - Navigating through presentation slides (google slides) - Answering multiple format questions presented in an online format (google form) - Communicating with an instructor to ask questions, provide lesson status, and submit answers to practice worksheet questions (Email is the most likely communication means, although an instructor may choose to incorporate the lessons within a google classroom or learning management system, which allow for use of additional digital literacy skills.)

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	- If the student designs their own statistics project there may be additional digital skills involved; they may decide to present their data in a google or word doc, Google or excel spreadsheet, create a video, etc.

Objectives, Materials, Vocabulary, and Culturally Responsive Teaching

Topic	Your Objectives, Materials, Vocabulary, and Culturally Responsive Teaching	Tips/Questions to Consider
Lesson Objective(s):	By the end of the lesson, students should be able to earn at least an 80% on the designated assessment which will measure their ability to calculate mean, median, mode, and range of a set of numerical data, and identify characteristics/purpose of each calculation.	• Check it with SMART. (Is it Specific, Measurable, Achievable, Relevant, and Timely?)
Texts, Materials, Resources:	**Lesson:** Lesson Material via google slides - Instructors will be required to create a copy of the google slides and save to their designated google drive: https://docs.google.com/presentation/d/17xHr5gfmHnsrU-Vd4jcF9ytQyQxy5ytdafZcHsBaaog/edit?usp=sharing **Independent Practice:** Math Drills Practice Worksheet: Student Worksheet (link is also within google Slides): https://docs.google.com/document/d/1mXbye3SJxUD13t5SwVK_SypGHoCW1fXqNOd-mJO6JMg/edit?usp=sharing Instructor Worksheet (student worksheet with answer key): https://docs.google.com/document/d/1Y7BesyYz5B7bUMhP8L3fLjUdMo-boIhVlSN3gVnfVLQ/edit?usp=sharing (This is only one of the worksheets available on the Math Drills website. If students need more practice there are other worksheets available.) **Assessment:** Assessment via google form (15 questions) - Instructors will be required to create a copy of the google form and save to their designated google drive. Instructors will then be able to establish their personal settings for use of this form:	• Are the recommended texts at the appropriate complexity levels, relevant to adult learners, culturally responsive, and useful for building knowledge and achieving the objectives?

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	https://docs.google.com/forms/d/1mVEok69ZdLBpOxouo6pWsQR9w5vYb7l0co_BXdVBuwo/edit	
Lesson Vocabulary:	Click or tap here to enter text.	• Include 5 -10 vocabulary terms. • Include instructional strategies below for teaching the vocabulary.

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Target Grammar/Language Forms (for ESL, if applicable):	Click or tap here to enter text.	• Include new grammar, or language forms, that is relevant to the context of the lesson. • Include new or unfamiliar grammar or language forms found in the text used for the lesson.

Culturally Responsive Teaching Notes:	Click or tap here to enter text.	• Is it evident that students will connect content to their own lives and to what they already know? • Do the student resources regularly include authors, images, and ideas from a range of racial, cultural, linguistic, gender, and (dis)ability representations and backgrounds, especially those of our students? • Do cultural representations and varied perspectives seem to be fair and accurate? Are

Topic	Your Objectives, Materials, Vocabulary, and Culturally Responsive Teaching	Tips/Questions to Consider
		stereotypes avoided?

Instructional Activities

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Lesson Introduction:	Within the lesson material (google slides) students are provided with a basic introduction to the math area of statistics as well as guidelines for completing the lesson. (Slides 1 - 7)	• Explain how the lesson objectives will be shared with learners. • Make connections to learners' goals and prior and future lessons.
Lesson Body: • **Direct Instruction** • **Guided Practice** • **Independent Practice**	**Lesson Body:** Students will read through a series of slides which explain and provide examples of mean, median, mode, and range. Students are instructed to also perform the calculations explained in the step by step solutions. (Slides 8 - 45) **Independent Practice:** Students are given the opportunity to complete practice questions as they proceed through the slides and then check their answers to ensure they understand the concepts. They can also complete a worksheet which can be submitted to their instructor for additional practice. Students can also design their own statistics project. (Slides 12-13, 14-15, 19-20, 21-22, 27-28, 29-30,35-36, 37-38, 46, 47)	• Provide enough detail that another instructor could teach this lesson based on the information in this lesson plan. • Include how the students will be grouped, approximate timeframes for each activity, and how technology will be integrated. • Describe how and where in the lesson sequence, the instructor will model the target skills and/or tasks for the learners.

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Differentiation:	Click or tap here to enter text.	• How can you and/or other teachers adapt this lesson to support learners with varying levels or needs (e.g., texts at different levels, broad topics, or compelling tasks that allow teacher/student flexibility)? • What kinds of choices are students able to make within the lesson plan (e.g., text selection, project topics, or products)?
Digital Literacy Integration:	Click or tap here to enter text.	• Are sufficient instructions given to students around the use of digital tools, and is sufficient time provided to practice using the tools? • Do students use digital tools to create and present products (e.g., papers, presentations, graphics)? • Are students provided with an opportunity to select and use appropriate technology to solve problems in class?
Lesson Conclusion:	Instructors should review the lesson objectives with students and give them an opportunity to discuss their comfort level with the material. If a student does not meet the 80% minimum score on the assessment, instructors will need to determine the additional effort required by the student and establish follow-up assessment requirements. Instructors can offer remediation by using worksheets found at https://www.math-drills.com/statistics.php#mean-median-mode-range	• Review lesson objectives. • Provide an opportunity for student reflection. • Connect to prior and future learning.

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Assessment:	Students will complete an assessment with varied question formats to determine if they understand and can apply the material presented in the lesson. They will be successful if they earn at least an 80% on the assessment.	• Describe the ongoing formative assessments that will be used to check learners' progress toward the lesson objectives. • Describe the cumulative assessments that will measure the extent to which learners met the lesson objectives.
Lesson Extension, Homework:	Click or tap here to enter text.	• Include opportunities for learners to practice skills outside of class time.
Lesson Extension, Additional Enrichment/Practice Opportunities:	Click or tap here to enter text.	• Include opportunities for learners to extend their learning through additional resources (print and online), readings, and practice of skills.

Instructor Reflection Before the Lesson

Instructor Reflection Questions (to be completed before teaching the lesson):

- Are the relevant CCRS Key Shifts addressed in the lesson (ELA – Text Complexity, Evidence, Knowledge; Math – Focus, Coherence, Rigor)?
- Are there opportunities to position students as experts on topics?
- What implicit bias might be reflected in the lesson or instructional design of the lesson?
- Were sufficient instructions on the use of digital tools provided, and do students have an opportunity to practice?
- Were students provided with the opportunity to make choices regarding the lesson topic, project, etc.?

Instructor Reflection After the Lesson

Instructor Reflection Questions (to be completed after teaching the lesson):

- What went well in the lesson?
- What did not go well in the lesson?
- Did the learners meet the lesson objectives? How do you know? If not, why?
- What changes should be made for next time the lesson is taught?