

Data About Us

Investigation 5 What Do We Mean by Mean? Day 1 5.1 Evening Things Out

Connection

Prior Work	Current Big Idea	Future Work
<ul style="list-style-type: none"> Collect data. Implement the process of statistical investigation to answer questions. 	<ul style="list-style-type: none"> Understand the mean as a process that “evens out” or “balances” a distribution. 	<ul style="list-style-type: none"> Create distributions with a designated mean.

Lesson Process

Steps	Student activity	Teacher Support	Comment/Evaluation
Launch 10-15 minutes	<ul style="list-style-type: none"> Read “What Do We Mean by Mean?” Create cube tower to show the number of people in student’s family. 	<ul style="list-style-type: none"> Discuss the United State census. “Why do you think the census asks ‘How many people are in your household?’ and not ‘How many people are in your family?’” The definition for household helps census takers to report population data accurately. 	<ul style="list-style-type: none"> Fathom may be used to “pull up” current U.S. census. Create data set from number of people in households for use in this section.
Explore	<ul style="list-style-type: none"> Complete Problem 5.1 and Problem 5.1 Follow-Up with teacher. 	<ul style="list-style-type: none"> This exploration may be completed through class instruction. 	<ul style="list-style-type: none"> Physical models are way to demonstrate how to “even

Steps	Student activity	Teacher Support	Comment/Evaluation
15-20 minutes		<ul style="list-style-type: none"> • Work with students to consider several different responses to the question “What are some ways to determine the average number of people in these six households?” • Have students consider using the mode and median as two possibilities. • Introduce the ideas of another way of thinking about average. • Build a tower of cubes for each student’s household from a single color. • Arrange the cube towers in order from smallest to largest. • Ask students to find the average by “evening out” the number of cubes in each tower. • The “evened out” number is called the mean. • Stick-on notes may be used to create a line plot for the same data about the number of people in each household. 	<p>things out.”</p> <ul style="list-style-type: none"> • How does the mean compare to the mode and the median for this set of data? • The concept that a stick-on note above a numeral on the line plot represents that number of people in one household may not be easy for students to grasp.
<p>Summarize</p> <p>8-10 minutes</p>	<ul style="list-style-type: none"> • Follow discussion lead by teacher. 	<ul style="list-style-type: none"> • Return to the tower model to find the mean. • Demonstrate the relationship in the line plot. 	

Steps	Student activity	Teacher Support	Comment/Evaluation
Homework	<ul style="list-style-type: none">• ACE question 1.		

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Investigation 5 What Do We Mean by Mean? Day 2 5.2 Find the Mean

Connection

Prior Work	Current Big Idea	Future Work
<ul style="list-style-type: none">Understand the process of “evening things out.”	<ul style="list-style-type: none">Find the mean for a given set of data.	<ul style="list-style-type: none">Use the mean to help describe a set of data.

Lesson Process

Steps	Student activity	Teacher Support	Comment/Evaluation
Launch 10-15 minutes	<ul style="list-style-type: none">Read Problem 5.2.	<ul style="list-style-type: none">Discuss Problem 5.2 with students.	
Explore 15-20 minutes	<ul style="list-style-type: none">Complete Problem 5.2 and Problem 5.2 Follow-Up with partner or with group.	<ul style="list-style-type: none">Help students relate to how the same set of data may be represented to different ways.In the cube towers, the data remain ungrouped.In the line plot the data are grouped and how the frequency of occurrence of each data value.	

Steps	Student activity	Teacher Support	Comment/Evaluation
Summarize 8-10 minutes	<ul style="list-style-type: none"> Discuss questions in Problem 5.2. 	<ul style="list-style-type: none"> Encourage students to share their strategies for solving the problem. Ask students to justify their strategies by explaining why what they did works. 	
Homework	<ul style="list-style-type: none"> ACE question 2. 	<ul style="list-style-type: none"> Ask students to write their definition for "mean." 	

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Investigation 5 What Do We Mean by Mean? Day 3 5.3 Data with the Same Mean

Connection

Prior Work	Current Big Idea	Future Work
<ul style="list-style-type: none"> Find the mean for a given set of data. 	<ul style="list-style-type: none"> Use the mean to help describe a set of data. 	<ul style="list-style-type: none"> Develop algorithm for find the mean for a given set of data.

Lesson Process

Steps	Student activity	Teacher Support	Comment/Evaluation
Launch 10-15 minutes	<ul style="list-style-type: none"> Read the line plots for 5.3. Develop a data set with the same mean as the data sets shown. 	<ul style="list-style-type: none"> Students should notice that although the mean of the two given data sets are the same, the distributions look different and the data values are different. “Do you think it is possible to have other sets of data about six household that are different from the one we explored and still have a mean of 4 people?” Challenge and work with student s to make a new distribution with six household and a mean of 4 people. 	

Steps	Student activity	Teacher Support	Comment/Evaluation
Explore 15-20 minutes	<ul style="list-style-type: none"> Complete Problem 5.3 and Problem 5.3 Follow-Up with partner or with group. 	<ul style="list-style-type: none"> For each data set, students should create a line plot distribution with stick-on notes. Post one line plot from each group and examine the line plots as a class. 	
Summarize 8-10 minutes	<ul style="list-style-type: none"> Look at displays for Part A. Discuss answers to Part A. Display line plots for Part B and discuss. 	<ul style="list-style-type: none"> Help students synthesize what they know about making distributions with different means. Ask questions that help student focus their observations on identifying common strategies. 	<ul style="list-style-type: none"> Questions in this section will lead into Problem 5.4.
Homework	<ul style="list-style-type: none"> ACE questions 3 and 4. 		

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Investigation 5 What Do We Mean by Mean? Day 4 5.4 Using Your Class's Data

Connection

Prior Work	Current Big Idea	Future Work
<ul style="list-style-type: none">Find the mean of a given data set.	<ul style="list-style-type: none">Develop algorithm for finding the mean for a given data set.	<ul style="list-style-type: none">Distinguish between the mean, median, and mode as ways to describe what is typical about a set of data.

Lesson Process

Steps	Student activity	Teacher Support	Comment/Evaluation
Launch 10-15 minutes	<ul style="list-style-type: none">Read Problem 5.4.	<ul style="list-style-type: none">Ask questions to help students verbalize what they know about strategies for finding the mean of a data set.	
Explore 15-20 minutes	<ul style="list-style-type: none">Complete Problem 5.4 and Problem 5.4 Follow-Up with partner or with group.	<ul style="list-style-type: none">Student work in pairs to collect data on the number of people in each student's household.Students should make a display of the data and calculate the mean of the data.Help students write a description summarizing what they discovered.	<ul style="list-style-type: none">Problem 5.4 Follow-Up provides a model for writing a summary for students' work

Steps	Student activity	Teacher Support	Comment/Evaluation
<p>Summarize</p> <p>8-10 minutes</p>	<p>Refine definition of mean.</p>	<ul style="list-style-type: none"> • “What does the class mean tell use?” • “How is a mean different from a median?” • Student should see the mean and median are both kinds of “middles.” • The median is the physical middle and the mean is the balance point value where the distribution would be evened out if all the values were equally shared. 	<ul style="list-style-type: none"> • Use Fathom to “down load” U.S. Census data from the net to use as demonstration data sets.
<p>Homework</p>	<ul style="list-style-type: none"> • ACE questions 5-7. 		

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Investigation 5 What Do We Mean by Mean? Day 5 5.5 Watching Movies

Connection

Prior Work	Current Big Idea	Future Work
<ul style="list-style-type: none">Develop algorithm for finding the mean for a given data set.	<ul style="list-style-type: none">Distinguish between the mean, median, and mode as ways to describe what is typical about a set of data.	<ul style="list-style-type: none">Representing data to aid with statistical analysis.Make predictions and inferences from data.

Lesson Process

Steps	Student activity	Teacher Support	Comment/Evaluation
Launch 10-15 minutes	<ul style="list-style-type: none">Read Problem 5.5.	<ul style="list-style-type: none">Discuss with students about the different ways the questions about the number of movies watched could be interpreted.	
Explore 15-20 minutes	<ul style="list-style-type: none">Complete Problem 5.5 and Problem 5.5 Follow-Up with partner or with group.	<ul style="list-style-type: none">Explore the possibilities of using the stem plot for the given data sets.Find the mean for given data sets.	
Summarize	<ul style="list-style-type: none">Summarize by using Problem 5.5.	<ul style="list-style-type: none">Use Problem 5.5 to focus summary.	

Steps	Student activity	Teacher Support	Comment/Evaluation
8-10 minutes	<ul style="list-style-type: none"> Start on Mathematical Reflections. 	<ul style="list-style-type: none"> Ask questions to strengthen students' understanding of the effect of new data values on the stem plot and the mean. 	
Homework	<ul style="list-style-type: none"> ACE questions 8 and 9. 		