

Quiz Grades Task H.O.T. Lesson LP

Discourse Team – For week of October 15

Unit: Patterns & Functions

Materials needed:

- Task card – 1 per student
- Calculator (optional)

Prior Knowledge:

- Students should be able to determine the mean, median, and mode given a data set.

Content Objectives:

- Students will reason about how the mean, median and mode are influenced when particular data point is changed or added to the data set (How does a particular change affect mean, median, and mode).

Language Objectives:

- Vocabulary: mean, median, mode, range
- Students will analyze other students' explanations (fake) and discuss the quality of the solution and explanation.

Begin lesson

- Review group norms. Make sure students understand what they are responsible for individually and as a group.
- Emphasize that the goal is not just to get an answer, but to be able to explain your thinking.
- Reinforce value of working in groups.
- Perhaps review *group questions* and *explain* the idea of *check points*.

Launch task:

- Hand out task cards. Tell groups approximately how long they have to work on the task. Monitor and make sure the task is being read out loud.
- Monitor groups as students work. Offer positive feedback for group behaviors that are productive.
- Respond when the materials manager has hand raised for a group question (make sure it's a group question before you respond) or for a Check Point.

Check point 1: (Step 2)

Questions:

- Quickly check to make sure that the students were able to correctly calculate the mean, median, mode, and range for the data set. If not, ask a student to explain how they arrived at the incorrect solution to uncover the mistake. Give students some time to fix their answer and then check back. If students have this correct, then it might not be worth it to spend time on having students explain how they got the mean, median, mode, and range. Instead, focus on the question for Step 3.
- For Step 2, ask a student to explain how they arrived at their answer.

- Things to listen for in answer to Step 2:
 - The mean will change more. Since the 40 is a much lower grade than the other quiz grades, it will lower the average. When you find the mean, you have to add 40 with all of the other numbers and then divide by 11.
 - The median will not change that much since when you add 40 to the set of quiz grades, the number in the middle is 78. However, without the 40, the median is 79. The median does not change that much since the numbers in the middle of the data set are very close to each other.
 - If students calculated the median and mean and determined which one changed more, then get students to explain why the 40 changed the mean by that much. Do this with the median as well.
- Possible follow up questions:
 - Ask another student in the group to repeat the explanation.
 - Ask another student in the group to explain how the mean and median change if the data point was changed to a smaller number such as 30.
- When the student(s) in a group can explain to your satisfaction, give them a sticker.

If students cannot explain, say that you'll come back in a few minutes. Let the group talk it over for a bit.

Whole-class Debrief of Task:

Ask students to volunteer to share their answer to Step 2. What did they conclude? Why do they think the mean changed more? Ask another group to reflect on the shared response. Any similarities? Differences?

Later in the Lesson:

Give students 3 different responses to Step 4 in the activity. Ask students to read Response A and write down ideas about whether they think it's a good explanation, a complete solution, and why. After this, model what a discussion with a partner might look like so that students have some idea. Then, let students share their ideas with their partner. Then, have a whole class discussion/list what people are noticing on the board about what makes a good explanation. Repeat for Response B and C. Refine list of what makes a good explanation. (Note that there should be variation in the responses.)

Characteristics of a Good Explanation:

- Organized
- Uses math language
- Clear, easy to understand
- Specific
- Supports answer

What Makes a Complete Solution?:

- Clearly state your answer
- Give enough information so that anyone can understand (pretend that teaching a friend, does the friend understand what you wrote?)
- Go back and check your work. Did you answer all the questions?

Closure/Exit slip:

- Highlight the key points of the lesson – students work on explaining their ideas; they worked on working together.
- Exit Slip: Ask students to respond to the following question: Look at your own explanation to Step 2. Why was your answer a good explanation? What can you change about your explanation to make it better?