

# 7<sup>TH</sup> GRADE – OTIMMS - OKC Lesson

## Again and Again and Again . . .

### OBJECTIVE:

- (OK PASS Standard 1.1) To collect data and model using a table and a coordinate graph
- (OK PASS Standard 5.1) To analyze data in graph to make predictions about future events

### MATERIALS NEEDED:

- Graph/Grid paper
- Clock/Watch with second hand
- One activity sheet per student
- Optional materials:
  - Items for repetitions (basketballs, tennis balls, jump ropes, etc.)
  - Large paper to construct a final (larger) graph

### LESSON:

- *Launch:*

Explain to students that they will be collecting data and modeling the data in two ways. The data they will gather will be from an experiment they perform. In order to perform this experiment they must first pick a repetitious activity to do in different time intervals. (Examples of activities might include bouncing a ball, patting their own head, writing letters in a straight line, jumping jacks, hopping, jumping rope, etc.)
- *Explore:*
  1. Once students have selected their repetitious activity, hand out the activity sheet to students. The teacher will act as the timer for the class. The students will perform their chosen activity and count the number of repetitions for 10 seconds with the teacher telling them when to start and stop. After the 10 seconds, students should record their data and make predictions based on that data about what they would expect to happen if they did the same activity for 20 seconds, 30 seconds, 1 minute, and 2 minutes. (Numbers 1 and 2 on the activity sheet.)
  2. Once students have completed the first two problems on the activity sheet, they should be partnered in groups of two to four students. (Working with

a partner will allow one or two students to perform the repetitions and the other one to count the number of repetitions their partner completes in the given amount of time.) The timer (teacher) will time the students as they complete the task for the time intervals of 10, 20, 30, 40, 50, and 60 seconds in a random order (i.e. 30, 50, 10, 40, 60, 20 seconds). Students should record their data on number three on the activity sheet after each timed activity. Once the students have completed all six intervals, then let them know the amount of time they were given for each trial. (Repeat this step as many times as needed until all students have number three on the activity sheet completed. You do not have to use the same order of intervals each time the activity is repeated.)

3. Students should then complete number four on the activity sheet by using the data from number three to create an organized table of data.
4. Students should then complete number five on the activity sheet by using graph/grid paper to create a coordinate graph of the data in table from number four on the activity sheet.
5. Students should then complete number six on the activity sheet by analyzing the data in the graph they created. In this summary, students should write an explanation of their graph and make predictions about future time intervals based on the data in the graph.

- *Summarize:*

Once all students have completed their summaries, have the class come back together for a discussion of the activity and what trends they noticed in their graphs. (What did they notice about their graphs?, What generalizations can you make from the graphs?, Do all the students graphs look the same and why or why not?, etc.)

*Note to Study Group participants:* When meeting for the student work session on this lesson, please provide five samples of students work of varying abilities. Please provide one copy of each of the five samples for each member of the group.

First Name Only \_\_\_\_\_

STUDENT ACTIVITY SHEET

1) Number of repetitions after ten seconds: \_\_\_\_\_

2) Predictions for repetitions for the following times:

20 seconds: \_\_\_\_\_

30 seconds: \_\_\_\_\_

1 minute: \_\_\_\_\_

2 minutes: \_\_\_\_\_

3) Record data for:

Trial 1: \_\_\_\_\_ secs \_\_\_\_\_ reps

Trial 2: \_\_\_\_\_ secs \_\_\_\_\_ reps

Trial 3: \_\_\_\_\_ secs \_\_\_\_\_ reps

Trial 4: \_\_\_\_\_ secs \_\_\_\_\_ reps

Trial 5: \_\_\_\_\_ secs \_\_\_\_\_ reps

Trial 6: \_\_\_\_\_ secs \_\_\_\_\_ reps

4) Create a table to organize the data for the six trials.

5) Use graph/grid paper to transfer your data from the table to a coordinate grid.

6) Analyze your data using complete sentences:

- Explain your graph. (What does it look like?, What does the graph tell you?, Were there any unexpected changes in your graph?, etc.)
- Make predictions based on your graph. (How did your original prediction match your graph?, What would you expect to happen after 2 minutes, 3 minutes, 10 minutes?, etc.)

STUDENT CHECKLIST  
(Self-Assessment)

- TABLE:
  - Labeled time and repetitions Yes\_\_\_\_\_ No\_\_\_\_\_
  - Organized data in order according to time Yes\_\_\_\_\_ No\_\_\_\_\_
  
- GRAPH:
  - Title graph Yes\_\_\_\_\_ No\_\_\_\_\_
  - Title x-axis Yes\_\_\_\_\_ No\_\_\_\_\_
  - Title y-axis Yes\_\_\_\_\_ No\_\_\_\_\_
  - Chose appropriate scale Yes\_\_\_\_\_ No\_\_\_\_\_
  - Used consistent interval Yes\_\_\_\_\_ No\_\_\_\_\_
  - Data points clearly plotted Yes\_\_\_\_\_ No\_\_\_\_\_
  
- ANALYSIS:
  - Written in complete sentences Yes\_\_\_\_\_ No\_\_\_\_\_
  - Explained graph in my own words Yes\_\_\_\_\_ No\_\_\_\_\_
  - Explained what the graph looked like Yes\_\_\_\_\_ No\_\_\_\_\_
  - Described relationship between time and number of repetitions Yes\_\_\_\_\_ No\_\_\_\_\_
  - Described any unexpected changes Yes\_\_\_\_\_ No\_\_\_\_\_
  - Compared my original predictions to actual data on graph Yes\_\_\_\_\_ No\_\_\_\_\_
  - Made predictions for 2, 3, and 10 minutes Yes\_\_\_\_\_ No\_\_\_\_\_

\*This is optional and should not be brought to student work session.

## RUBRIC

	<b>Table</b>	<b>Graph</b>	<b>Analysis</b>
<b>4</b>	<ul style="list-style-type: none"> <li>▪ Correct labels</li> <li>▪ Organize data sequentially</li> </ul>	<ul style="list-style-type: none"> <li>▪ Correct labels ( title, x and y axis)</li> <li>▪ Consistent intervals and appropriate scale</li> <li>▪ Data points clearly and correctly plotted</li> <li>▪ Dep. and indep. on the correct axis</li> </ul>	<ul style="list-style-type: none"> <li>▪ Written in complete sentences</li> <li>▪ Describes relationship between x(time) and y(number of repetitions)</li> <li>▪ Addresses each summary point</li> <li>▪ Predictions are reasonable according to data</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>▪ Correct labels</li> <li>▪ Organized data but may not be in sequential order</li> </ul>	<ul style="list-style-type: none"> <li>▪ Most labels correct</li> <li>▪ Most intervals consistent with appropriate scale</li> <li>▪ Data points clearly and correctly plotted</li> <li>▪ Dep. and indep. On correct axis</li> <li>▪ May not start at origin</li> </ul>	<ul style="list-style-type: none"> <li>▪ Written in complete sentences</li> <li>▪ Describes relationship between x and y</li> <li>▪ Addresses most summary points</li> <li>▪ Predictions are reasonable according to data</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>▪ Missing some labels</li> <li>▪ Data organized, some may be missing and/or not sequential</li> </ul>	<ul style="list-style-type: none"> <li>▪ Some labels incorrect and/or missing</li> <li>▪ Inconsistent intervals</li> <li>▪ Errors in plotting data points</li> <li>▪ Dep. and indep. may be on wrong axis</li> </ul>	<ul style="list-style-type: none"> <li>▪ Unclear communication</li> <li>▪ Did not answer all summary points</li> <li>▪ Demonstrates faulty reasoning</li> </ul>
<b>1</b>	<ul style="list-style-type: none"> <li>▪ Attempt was made with many errors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Attempt was made with many errors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Attempt was made with many errors</li> </ul>