Curriculum Sample Template
Max. 8 Pages

Grade Level	6	**Content Area**	Mathematics
Course Title (grades 9-12 Only)			
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students will have an understanding of statistical vs. non-statistical questioning and will know the fundamentals of creating and reading graphs.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	Sierra Preparatory Academy will use the Connected Mathematics Program developed by Michigan State University and the National Science Foundation which employs a Socratic method of instruction that is mapped directly to the Common Core standards. *(The following lesson is adapted from a Connected Math lesson used by the Howard County Public School System.)*		
Standard Number and Description *List the Number* and the full description for the Required Standard or Science Performance Objective listed in section A.6.*	6.SP.2 Grade: 6 Domain: Statistics & Probability (SP) Cluster: Develop understanding of statistical variability Standard: #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.		
Materials/Resources Needed	Connected Math materials: Per group of 3 students – 4 question strips cut apart, 1 magazine picture, 1 blank sentence strip, 1 marker, 2colors of Post-It notes - 1 of each per student, 16 ounce plastic cups with yarn tied to a spool - 1 per pair of students, 1 copy Closure Resource for display, Student copies of Homework Resource pages (2) **Note: Use of CD-ROM "Minitool 2: Using Dot Plots to Compare Data" from Navigating through Data Analysis in Grades 6-8 - NCTM Navigation Series may be substituted for displaying the class data on the whiteboard.		

**** Standard Number**: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

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Lesson (add as needed)	**Instructional Strategies**	**Student Activities**
1	This is a three day curriculum sample. Day 1 Lesson Goals: 1. Students will develop their understanding of the word "typical" as they make sense of how the class data are spread or grouped and what the data reveals about the population from which they are taken. 2. Students will be able to use the shape of the whole set of data to make a prediction beyond the class data set. 3. Students will be able to use the features in the shape of the data, presented in line plots, to match each with a described situation. (Evidence of success will be qualitatively measured through active student participation in discussions, the data gathering activity, and students' ability to describe the shape of data displays and make predictions of what is "typical" based on their observations of line plots. The homework will also provide evidence of students being able to create statistical questions and whether they are able to use the shape of data, displayed on a line plot, to describe what is "typical".) Lesson Launch and Review – Each group of 3 students will be given a set of 4 questions to sort as to whether the question could be answered with only a single data point (non-statistical) or if the answer could be any value in a range of numbers (statistical).	Once students review principles behind statistical and non-statistical, each group will generate its own example of a statistical question to share with the class using a provided magazine picture for inspiration. While students share examples, they should be sure to clarify statistical versus non-statistical questions and build understanding as to the important role questions play in the process of statistics. In groups, students will complete the "Launch and Review" activity and share results with the class. For homework, students will individually complete a worksheet that reinforces the concept of statistical vs non-statistical questioning (see assessment #1).
2	Day 2 Introduction of Task – Present the statistical question, "How many times can the typical 6th grader catch a spool in a cup in one minute?" After helping students develop a procedure to answer the	Students will make predictions about the number of catches, and whether they think it will make a difference which hand they are using. Students will select a partner and take turns catching a spool in a cup while their partner makes a tally count on a post-it note. All pairs should use the designated color post-it note for the right

	question, the teacher will be the timekeeper, announcing when each trial should begin and end.	hand tallies. Roles should be switched and the procedure repeated for the other student of the pair. The tally counts should be converted to frequency counts and then brought to the front where a number line is displayed on the chalkboard. The post-it notes, for the right hand data should be posted above the number telling the number of catches. Repeated numbers should be stacked above one another. Repeat the counting/posting procedure for the left hand catches, but post these, using the other color post-it notes, below the same number line.
3	Day 2 continued Comprehending the shape of the data – the teacher will focus students' attention on the right hand data display as a whole shape. The teacher will assist students in making connections among the observed patterns, and lead them towards interpreting the relationships to arrive at an answer to the data question. Repeat this procedure for the left hand data, while comparing the overall shape to the right hand display. Pose the questions, "How does the line plot aid in our understanding the data that we have collected?" "What predictions/inferences can we make about the number of catches a typical 6th grader could be expected to make?" The Teacher introduces the homework/closure activity.	Students will locate and describe the spread, the clusters created by frequently occurring values, gaps, and outliers (values significantly larger or smaller than the other values). The class will discuss factors that might account for the observed results. Homework: Given a data table of the number of minutes commercial advertisements are displayed during 20, 30-minute television shows, students will construct a line plot graph and use the shape of the data and informal analysis to decide and explain what is the typical number of commercials to expect during a 30-minute television show.
5	Day 3 The teacher grades the homework with students, then presents a unit quiz.	Students take a unit quiz (see assessment below).

Summative Assessment Items: *Attach here.* For each summative assessment item, include an answer key or scoring rubric describing how points are to be awarded.

Assessment #1 – Graded Review Worksheet of Statistical vs. Non-Statistical Questions

1. What is your middle name?	11. How old is your mother?
2. What size shoe do you wear?	12. What is the age of the mothers in your neighborhood?
3. How tall are boys in the 6th grade?	13. What makes a good teacher?
4. Is it important to exercise and eat healthy?	14. How friendly is your dog?
5. At what speed are cars driving by our school?	15. What is the length of a typical cat?
6. What does cauliflower taste like?	16. When is your birthday?
7. How old is your best friend?	17. Which magazine is the favorite of 6th graders?
8. How do you learn new material the best?	18. How heavy is a 6th grader's backpack?
9. What is the typical number of peanuts in a 6oz. bag?	19. How many total sisters or brothers does the 6th grade have?
10. How trainable is a ferret?	20. Which month of the year is the most fun?

Answer Key

1. NS	11. S
2. S	12. S
3. S	13. NS
4. NS	14. NS
5. S	15. S
6. NS	16. S
7. S	17. S
8. S	18. S
9. S	19. S
10. NS	20. NS

Total Points Possible: 20
Mastery: 17 points (85%)

Assessment #2

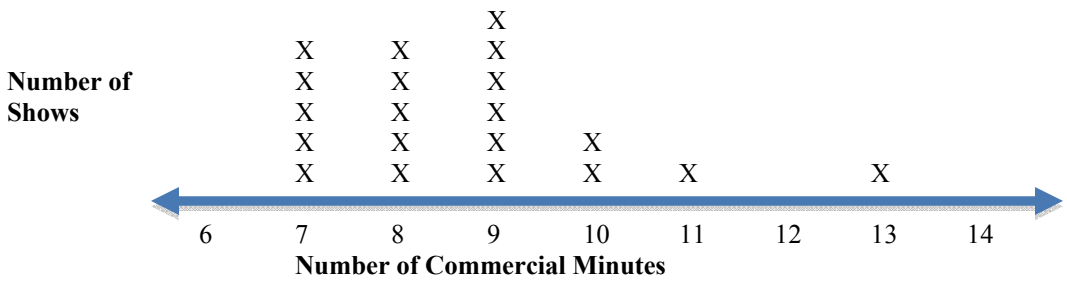
1. Given the following table of data, construct a line plot with an appropriate title and labels.

Number of Commercial Minutes	Number of 30 Minute Shows
6	0
7	5
8	5
9	6
10	2
11	1
12	0
13	1
14	0

2. Looking at the overall shape of the data, including its center and spread, what would you say is the *typical* number of commercial minutes that occur during a 30-minute television show? Use some of the words that were used during class today in your explanation.

Answer to Question #1

Commercial Minutes per 30 Minute Television Show



Scoring Rubric:

Correct Title:	2 points
Correct axis labels:	2 points each (four points total)
Correct line plot:	5 points

	1	2	3	4
Thoroughness of Explanation	Student explanation	Student explanation	Student explanation	Student explanation

	contained minimal information concerning "center, spread, and overall shape" with significant errors.	contained some information concerning "center, spread, and overall shape" with some errors.	contained adequate information concerning "center, spread, and overall shape" with no significant errors.	contained extensive information concerning "center, spread, and overall shape" with no errors.

Total Points Possible: 15
Mastery: 13 points (≈85%)

The teacher will hand out a Unit Quiz with four completed line plots.

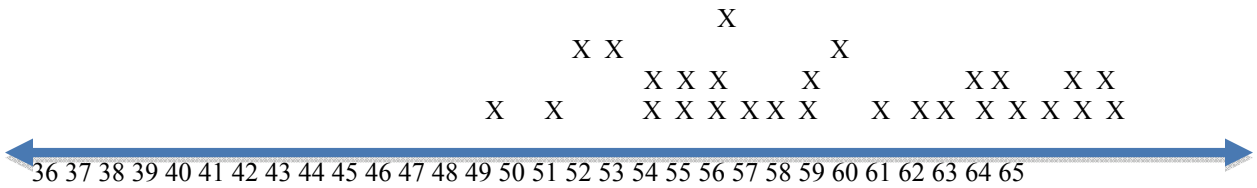
Assessment #3 – Unit Quiz

These graphs were made based upon data collected to answer the statistical question – "How do heights of elementary students change over the grades?" The problem is, we don't know which graph came from which group of students that were measured. We do know that the data was collected in four situations:

a. The height of every 10th student entering the building was gathered last Monday morning.
b. On Tuesday, Ms. Johnson's kindergarten class was measured.
c. On Wednesday, the heights of the third graders, in Ms. Jones class, were measured.
d. On Thursday, they measured the heights of each fifth grader in Mr. Smith's class.

Your job is to match each graph with one of the situations, write a title, and label the units on each graph. Use the shape of the data to explain your choices.

Graph 1



Graph 2

```
                    X                 X X
                    X       X       X X
                    X X     X X X X X X
X     X X X X X X X X X X X     X
36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
```

Graph 3

```
                  X
                  X X     X       X       X       X                   XX
X X     X X     X X     X X     X X X X     X X     X X     X X     X X     X
36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
```

Graph 4

```
            X     X
            X     X X
          X X X X X
      X X X X X X
X X X X X X X X   X     X     X
36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
```

Answer Key:

Graph 1: d
Graph 2: c
Graph 3: a
Graph 4: b

All units should be in inches, and all graphs should have corresponding titles.

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Scoring Rubric:

	1	2	3	4
Proper matching of graphs to description	Student correctly matched one graph to its description.	Student correctly matched two graphs to the descriptions.	Student correctly matched three graphs to the descriptions.	Student correctly matched four graphs to the descriptions.
Labelling of units	Student correctly titled and labelled the units on one graph.	Student correctly titled and labelled the units on two graphs.	Student correctly titled and labelled the units on three graphs.	Student correctly titled and labelled the units on four graphs.
Thoroughness of Explanation	Student explanation contained minimal information concerning "center, spread, and overall shape" with significant errors.	Student explanation contained some information concerning "center, spread, and overall shape" with some errors.	Student explanation contained adequate information concerning "center, spread, and overall shape" with no significant errors.	Student explanation contained extensive information concerning "center, spread, and overall shape" with no errors.

Total Points Possible: 12
Mastery: 10 points (≈85%)