CMS Lesson Plan

 Subject: Math

 Variability in Data Date: 3/14/2016 – 3/18/2016

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| GSE Assessment Limits/StandardsUnit 6 – Standards**MCC.6.NS.**5 **Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.**MCC.6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates**MCC.6.NS.7** Understand ordering and absolute value of rational numbers. **MCC.6.NS.7a** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. **MCC.6.NS.7b** Write, interpret, and explain statements of order for rational numbers in real-world contexts. MCC.6.NS.7c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.**Begin Unit 7 – Standards** **Develop understanding of statistical variability.****MCC.6.SP.1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.**MCC.6.SP.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.*(Shape center and then spread) (Different words to mean the same thing, Variability, Spread, Measure of Variation) (Distribution what does it mean graph, spread set of values)*MCC.6.SP.3 Recognize that a measure of center for a numerical 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. | Monday, Tuesday & Wednesday – Finish Unit 6 and test on Tuesday &Wednesday (Pretest on Unit 7)Thursday & Friday – Begin Topic: Statistics |
| Lesson Objective/Learning Intention: (Objectives will vary depending upon the pace of the students)Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.*

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| **MASTERY Patterns of Reasoning:** |
| **Conceptual**:Understand that data generated from statistical questions will vary.A statistical question anticipates an answer that varies from one individual to the next and is written to account for the variability in the data.Recognize that responses to statistical questions have variations that can be used to draw conclusions about the data set.**For example, asking classmates “How old are the students in my class in years?” will result in less variability than asking “How old are the students in my class in months?”** | **Representational**:Create models that represent the anticipated data from statistical questions such as charts and tables. | **Procedural**: Identify the difference between a statistical and non-statistical question.Write simple statistical questions.Students might want to know about the fitness of the students at their school. Specifically, they want to know about the exercise habits of the students. **Non-statistical question:**"Do you exercise?" **Statistical question:**“How many hours per week on average do students at Rockdale Middle School exercise?”  |
| **Instructional Strategies**  |
| Grade 6 is the introduction to the formal study of statistics for students. Students need multiple opportunities to look at data to determine and word statistical questions. Data should be analyzed from many sources, such as organized lists or bar graphs. This will help students begin to understand that responses to a statistical question will vary, and that this variability is described in terms of spread and overall shape.Statistics are numerical data relating to an aggregate of individuals; statistics is also the name for the science of collecting, analyzing and interpreting such data. Data are the numbers produced in response to a statistical question. Data are frequently collected from surveys or other sources (i.e. documents). Students differentiate between statistical questions and those that are not. A statistical question is one that collects information that addresses differences (variability) in a population. The question is framed so that the responses will allow for the differences (variability). For example, the question, “How tall am I?” is not a statistical question because there is only one response; however, the question, “How tall are the students in my class?” is a statistical question since the responses anticipates variability by providing a variety of possible anticipated responses that have numerical answers. Questions can result in a narrow or wide range of numerical values.Provide examples and non-examples of statistical questions such as:Example: Over the course of the month, what time did Billy eat breakfast each day?Non-example: What time did Billy eat breakfast today?Direct students to generate questions, and then as a class decide whether they are statistical questions or not. |
| **Academic Vocabulary and Notation** |
| data, expectation, statistics, variability |
| **Instructional Resources and Tools** |
| <http://www.math.wichita.edu/history/topics/stat.html>Newspaper and magazine graphs for analysis of the spread, shape and variation of dataFrom the National Council of Teachers of Mathematics, Illuminations: [Numerical and Categorical Data](http://illuminations.nctm.org/LessonDetail.aspx?ID=L368).In this unit of three lessons, students formulate and refine questions, and collect, display and analyze data. |
| **Common Misconceptions** |
| Students may believe all graphical displays are symmetrical. Exposing students to graphs of various shapes will show this to be false. |
| **Assessment Tasks**  |
| **Skill-based Task:**Given a list of questions, students will categorize them as statistical or non-statistical. For example, what color is my pencil? (non-statistical) What are the colors of the pencils in this class and how many of each is there? (statistical)Website Resources: learnzillion.com (email me if you need a code), connected.mcgraw-hill.com (see my website for logon details) inside mathematics, illustrative mathematics, MAP Assessments | **Problem Task:**Students will create their own statistical and non-statistical questions and address how the data might vary in response to that question. Encourage students to create story contexts for the questions given. | **Performance Task:****See required Benchmark** **For Specific Standard** |

Resources/Instructional Materials Needed: *(What do students need in order to learn what is required of this lesson)*Paper, pencil, binder, math notebook, 6th grade textbook (housed in the classroom), attention and focus.Notes: Differentiation – Students will use models, hands-on, remediation where needed, small group with peers and small groups with the teacher, online resources, number lines. (large and small with different numbers)-(Khan Academy-l Learnzillion.com

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| **Instructional Strategies**  |
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| **Academic Vocabulary and Notation** |
| Unit 6 - Rational Numbers, Absolute Value, Coordinates, x-coordinate, y-coordinate, ordered pair, y-axis, x-axis, inequality, quadrant, integers, polygon, origin, sign, distance, negative number, positive number, opposite numbers, CartesianPlaneUnit 7 - data, expectation, statistics, variability |
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| **Common Misconceptions** |
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| **Assessment Tasks**  |
| Unit 6 TestUnit 7 Pretest |  | **Performance Task:** |

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| Assessment Tasks used |
| **Skill-based Task:** | **Problem Task:** | Performance Task:Plane |

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