NCEA Math Lesson Plan

Grade: 6 **Subject:** Mathematics

Domain:
Statistics and Probability

Standard Number(s) and Description:
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. 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.

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.

Vocabulary to be Highlighted:
Statistical question, mean, median, mode, range, minimum, maximum

Mathematical Practices (#):
1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
6. Attend to precision.

Essential Questions:
How do we identify statistical questions?
How do we contrast statistical and nonstatistical questions?
What are measures of center and how do we determine them?
How can we identify and create statistical and nonstatistical questions?
How can we use the mean, median, mode, and range to describe the shape of the data?
How can we compute the mean, median, and range?
How can we determine the mode, minimum, and maximum of a data set?

Materials/Tools (include technology):
Calculator

Connections to Other Math Domains:

Connections to Other Subject Areas:
Religion

Catholic Identity Component:
Discuss the circle graph about religions in the world (link below):

- Which religion has the most followers?
- What other conclusions could you draw about the circle graph?

Resources (attachments):
Major branches of world religions circle graph: available at http://www.edenjournal.com/wp-

content/uploads/2010/04/MajorBranchesOfWorldReligionsNumberofAdherentsWorldwide.jpg

Activities/Timeline:

1. View an example of graphs demonstrating responses to statistical questions about religion. Discuss why we ask statistical questions. For what purpose do we use the data?

2. Define statistical question. A statistical question is one that we can answer by collecting data and where there will be variability in that data. An alternative definition is a question 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 the response.

3. Ask students to identify whether or not the following examples are statistical questions:
   - How many days are in March?
   - How old is your dog?
   - How old are the dogs on this street?
   - What percent of people like watermelons?
   - Do you like watermelons?
   - How many bricks are in this wall?
   - What was the highest temperature today in town?
   - How many minutes do sixth grade students spend on their homework each night at our school?

4. Ask students to work in pairs to create their own statistical question(s). Students should create both statistical questions and non-statistical questions. Students should write each question on an index card. Collect and shuffle the cards. Pass the cards out at random to groups of students, who will then divide the cards into two piles - one for statistical questions and one for non-statistical questions. Students should be able to explain their classification for each question.

5. Select one of the statistical questions and collect data from the class (or use the sample question above on nightly minutes of homework). Ask students for their responses and record information on the board while students copy information into their notes.

6. Introduce and define terms: data set, mean, median, mode, range, minimum, and maximum.

7. As a whole class, arrange data in order from least to greatest. Tell students that we arrange data in order from least to greatest to make it easier to manipulate.

8. Once we have the data in order, show how to find the minimum and maximum values of the data set.

9. After identifying the maximum and minimum, ask students how we could find the number of steps between the maximum and minimum values. This number represents the range of data. Discuss as a class what a large or small range/spread of data tells about the data set.

10. What is the middle value of the items in the data set when arranged from least to greatest? This represents the median. If you have an even number of values, take the average of the middle two items in the data set.

11. Now, look at the data set again. Do any numbers repeat themselves? Which number appears the most? That number is the mode. You might have more than one mode in a data set. You might have each item appear an equal number of times, in which case, there is no mode (notice-

this does not mean that zero is the mode! Write “none” or “no mode” instead).

12. Look at another set of data. Have student come up to collect data on the board about the number of letters in each student’s first name. Individually, students should find the mean, median, mode, minimum, maximum, and range of the data and make sure to show all their work. Collect student responses to assess their understanding.

Formative Assessment (what to look for, how/when to look):
Observe student responses.

Summative Assessment: