TASK 1

Get Started on the Culminating Project

Objectives

You will be able to

- Identify statistical questions.
- Create survey questions using statistical questions.
- Distinguish between categorical and numerical data.
- Represent data using dot plots.

How can we use mathematics to compare what is typical and what is unique about our class?

Evaluation and Feedback

To evaluate your work, you will

- Complete the check for understanding about statistical questions.

Learning Task 1: Get Started on the Culminating Project

As a group:

- Learn about the Culminating Project.
- Fill out a school census questionnaire.
- Write four numerical and four categorical survey questions.
- Answers the questions that the other groups wrote.
- Make a dot plot that reflects the class answers to one of the questions.

Vocabulary

- categorical question
- dot plot
- statistics
- statistical question
- questionnaire

Connect to the Culminating Project

You will:

- Write questions about sixth-grade activities.
- Answer the questions and collect class data.
- Make a dot plot of the class response to one of the questions.

TASK 1

Get Started on the Culminating Project

LESSON 1

CLASS PROFILE

Class Profile Culminating Project

Name: _____ **Team:** _____

You will create a Class Profile of data that you collect about your class. You will use your Class Profile to compare your class with sixth graders across the country.

Make sure that your Class Profile Culminating Project includes:

- ❑ Two numerical statistical questions to analyze data for, with an explanation as to why these questions are statistical, why they are numerical, and why you chose to analyze them
- ❑ A picture of or link to your raw data that shows how you calculated the mean and five-number summary
- ❑ Dot plots to represent both of your questions; the dot plots should include:
  - ❑ Title
  - ❑ Appropriate labels
  - ❑ Mean, median, and mode, and an explanation of which measure would be the best summary of both dot plots and why
- ❑ Box plots to represent both of your questions; the box plots should include:
  - ❑ Title
  - ❑ Appropriate scale
  - ❑ Appropriate labels
  - ❑ Range, interquartile range, and the number of observations reported
  - ❑ An explanation of how the data is distributed using statistics vocabulary in context
- ❑ A comparison of your class data to national data (using a new question or one of the questions you already analyzed), including:
  - ❑ Two box plots to compare the data sets (with title, labels, and appropriate scale)
  - ❑ An explanation of the similarities and differences between your class data and the national data
  - ❑ A comparison of central tendencies and variability using statistics vocabulary in context

Class Profile Culminating Project Rubric

MATH PRACTICE	MASTERS	ACHIEVES	APPROACHES	NOT YET
Model with mathematics (MP4) Dot plots	Our dot plots accurately represent our data. We include the correct mean, median, and mode. We accurately and thoroughly explain which measure of central tendency would be the best summary for each graph.	Our dot plots mostly represent our data. We include the correct mean, median, and mode. We partially explain which measure of central tendency would be the best summary.	Our dot plots mostly represent our data. We include the mean, median, and mode with some errors. Our explanation of which measure of central tendency would be best is incomplete or flawed.	Our dot plots do not represent our data. We do not include the correct mean, median, or mode. We do not explain which measure of central tendency would be the best summary.
Model with mathematics (MP4) Box plots	Our box plots accurately represent our data. We include the correct range, interquartile range, and number of observations. We accurately and thoroughly explain the distribution of each graph using math terms and real-life terms.	Our box plots accurately represent our data. We include the correct range, interquartile range, and number of observations. We mostly explain the distribution of each graph using math terms and real-life terms.	Our box plots mostly represent our data. We include the range, interquartile range, and number of observations with some errors. Our explanation of distribution is incomplete or flawed.	Our box plots do not represent our data. We do not include the correct range, interquartile range, or number of observations. We do not explain the distribution of the graphs.
Construct viable arguments (MP3) Comparing graphs	We use a consistent scale when comparing our class graph to the national graph. We thoroughly and accurately explain what is similar and what is different about the data sets. We thoroughly and accurately describe the data using math terms and real-life terms.	We use a consistent scale when comparing graphs. We mostly explain what is similar and what is different about the data sets. We mostly describe the data using math terms and real-life terms.	We use a consistent scale when comparing graphs. Our explanation of what is similar and different is incomplete or flawed. Our descriptions do not use both math terms and real-life terms.	We do not use a consistent scale when comparing graphs. We do not explain what is similar and what is different about the data sets.
Construct viable arguments (MP3) Statistical questions and data	We thoroughly explain why our questions are statistical and numerical. We show how we used our raw data to calculate the means and five-number summaries.	We mostly explain why our questions are statistical and numerical, **or** we partially show how we used our raw data to calculate the means and five-number summaries.	Our explanations for why our questions are statistical and numerical are incomplete or flawed, **or** we include links or pictures of our raw data but do not show how we used them.	We do not explain why our questions are statistical and numerical, **or** we do not include links or pictures of our raw data.
Attend to precision (MP6)	We make accurate calculations during our analysis. We use appropriate scales and labels. We correctly use math vocabulary in our descriptions.	We mostly make accurate calculations during our analysis, **or** we mostly use appropriate scales and labels, **or** we mostly use math vocabulary correctly.	We have errors in our calculations, **or** we do not use appropriate scales and labels, **or** we do not use math vocabulary correctly.	We do not use scales or labels, **or** we do not use math vocabulary.

Get Started on the Culminating Project

WARM-UP

Introduction to Class Profiles

- Why do you think a class profile might be useful?

PROJECT ACTIVITY

School Census

Complete the Census at School Questionnaire online or your teacher may give a copy of "U.S. Census at School Questionnaire."

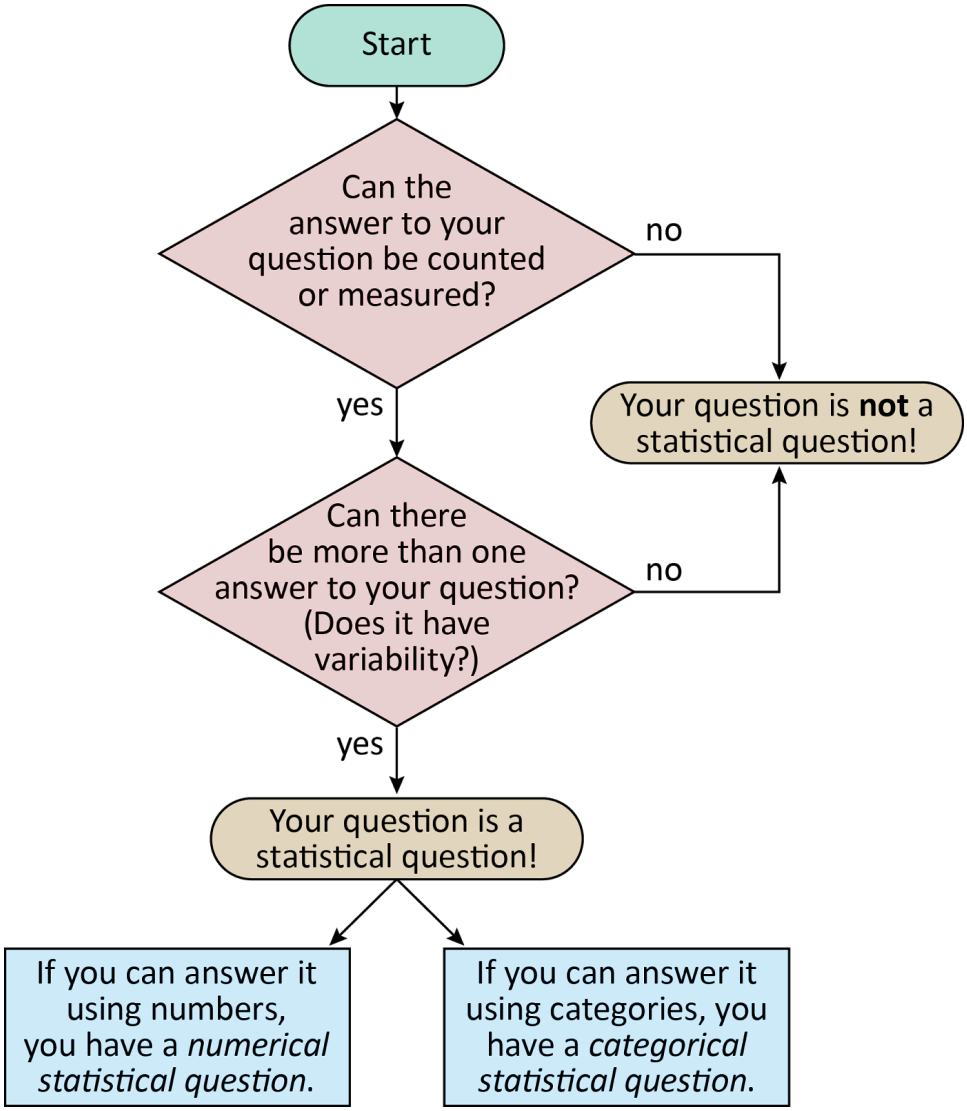
If you use the online version, make sure to follow all school rules about online safety. Your teacher will provide guidance.

LESSON 2
STATISTICAL QUESTIONS

WARM-UP

Statistical Flowchart

1. Review this Statistical Questions Flowchart.



2. Use the Statistical Questions Flowchart to decide whether or not each of the questions below is a statistical question.
    a. When is your birthday?
    b. How many minutes do students typically read each day?
    c. How many people live in California in 2017?
    d. What is your favorite movie?
    e. What are your class's favorite movies?

PROJECT ACTIVITY

Who Are We?

You are going to write your own statistical questions like the ones from the school census. The questions will be combined into one "Who Are We?" survey that the class will take in order to collect data about ourselves and our community.

1. Read over the topic that your teacher assigns you (or choose a topic) in the table below. Each topic provides an example of a categorical and numerical question.

Topics for Survey Questions

Health Categorical: What is your favorite way to stay healthy? Numerical: How many hours of sleep do you typically get?	**Hobbies and Sports** Categorical: What is your favorite type of art? Numerical: How fast can you run 400 meters?
Travel Categorical: How do you get to school? Numerical: How many minutes does it take you to get to school?	**Home** Categorical: What types of celebrations does your family have? Numerical: How many celebrations do you participate in during a typical month?
School Categorical: What languages are spoken at your school? Numerical: How many students are in a typical class at your school?	**Career Interests** Categorical: What job would you like to have? Numerical: How many hours do you spend on schoolwork in a typical week?
Food Categorical: What is your favorite food? Numerical: How many servings of vegetables do you eat in a typical day?	**Entertainment** Categorical: What is your favorite type of music? Numerical: How many songs do you have on your favorite playlist?

LESSON 2 • STATISTICAL QUESTIONS

2. Write eight statistical questions about your topic—four that will yield numerical data and four that will yield categorical data.

Our Team's Topic: _____

Four Numerical Statistical Questions	Four Categorical Statistical Questions

LESSON 3
DOT PLOTS

WARM-UP

Survey and Sleep Log

1. Your teacher will give you the "Who Are We?" survey comprised of the questions the teams wrote in the previous lesson.
2. Answer each of the questions. The data will later be collected into a Class Profile that you will compare with other sixth graders across the country.
3. Over the course of the unit, you will fill in a Sleep Log to record the number of minutes you sleep each night. The purpose of this log is to create a classroom-wide data set that you will track and analyze. Everyone in the class will track their sleep, including your teacher!

Sleep Log

Date	Minutes of Sleep	Date	Minutes of Sleep	Date	Minutes of Sleep
1.		15.		29.	
2.		16.		30.	
3.		17.		31.	
4.		18.		32.	
5.		19.		33.	
6.		20.		34.	
7.		21.		35.	
8.		22.		36.	
9.		23.		37.	
10.		24.		38.	
11.		25.		39.	
12.		26.		40.	
13.		27.		41.	
14.		28.		42.	

LESSON 3 • DOT PLOTS

Notes:

Some articles about the importance of sleep. Check them out!

http://kidshealth.org/teen/your_body/take_care/how_much_sleep.html

http://www.nationwidechildrens.org/sleep-in-adolescents

PROJECT ACTIVITY

Dot Plots

1. With your team, choose one of the numerical questions from the "Who Are We?" survey you just took.
2. Use the data from that question to create a dot plot on chart paper using pencil. Make sure it includes everything it needs before adding color.
3. You can use the dot plot tool to help you get organized.
4. Answer the questions below about the dot plot.

The numerical statistical question we are using is:

Our dot plot needs:

- ❑ An appropriate title
  – What, specifically, does the data show?
- ❑ A label for the numbers at the bottom
  – What do these numbers mean?
- ❑ Precision
  – Do the dots match the data you collected?
- ❑ The number of observations you are reporting
  – How many pieces of data did you collect?

Attach or Insert the picture of your finished dot plot here.

CHECK FOR UNDERSTANDING

Test your knowledge of what makes a statistical question using the Check for Understanding • Statistical Questions.