

Interpret Data

Objectives

You will be able to

- Calculate mean, median, range, five-number summaries, and interquartile range.
- Describe, interpret, draw conclusions from, and compare the distribution of data sets.
- Represent data using dot plots and box plots.
- Understand that data sets can have similar centers but different variability.
- Describe typical cases, distinguishing between what different measures of central tendency indicate about data.



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 a check for understanding about comparing two data sets.
- Calculate mean, median, range, five-number summaries, and interquartile range.

Learning Task 4: Interpret Data

As a group:

- Practice using statistical language.
- Compare your class to national data about sixth graders.

Vocabulary

- cluster
- gap
- outlier
- peak
- skew
- spread

Connect to the Culminating Project

You will

- Compare national data to class data for a question from the "Who Are We?" survey.
- Begin to analyze the data you collect to answer the question, "What can we say or summarize about our data?"
- Compare data sets and look for similarities and differences.



LESSON 1

TALK LIKE A STATISTICIAN

WARM-UP

Word Wall

- You will read an article or watch a video as a class.
- Update Statistics Word Wall to include spread, peak, cluster, gap, outlier, skew.

PROJECT ACTIVITY

Describe Distributions

For each graph below, describe the distribution (central tendency and variability). Use words from the Statistics Word Wall. Then explain what your description means in context, or real life.

1.



Describe the central tendency using the words of statisticians.	Describe the central tendency in context.
Describe the variability using the words of statisticians.	Describe the variability in context.



LESSON 1 • TALK LIKE A STATISTICIAN

2.



Describe the central tendency using the words of statisticians.	Describe the central tendency in context.
Describe the variability using the words of statisticians.	Describe the variability in context.

3. Use your sleep data to create a dot plot and a box plot. Describe them below.

Describe the central tendency using the words of statisticians.	Describe the central tendency in context.
Describe the variability using the words of statisticians.	Describe the variability in context.



LESSON 2

HOW DO WE COMPARE?: PART I

WARM-UP

Interpret Box Plots

The box plot below represents the number of pets per family for students in a sixth-grade class.

Number of Family Pets



- 1. Is it possible to know from this graph how many families have exactly 2 pets? Explain why or why not.
- 2. Determine whether these statements are true or false. Justify your answers.
 - a. Some families have 0 pets, some families have 8 pets, and some families have between 0–8 pets.
 - b. Most of the families have 2 pets.
 - c. About $\frac{1}{4}$ of the families have 5 or more pets.
 - d. Most of the families have 5 or more pets.



LESSON 2 • HOW DO WE COMPARE?: PART I

PROJECT ACTIVITY

How Do We Compare to Others across the Country?

In building your Class Profile, your team has collected and analyzed data about your class using your own survey questions, Sleep Log, and the Census at School Questionnaire. Now you will see how your data compares with that of other sixth graders across the country. Your teacher has generated a random sample of data from 25 sixth graders across the United States.

For this Learning Task, your team will

- a. Choose a statistical question for which you have numerical class data and national data.
- b. Calculate the mean and five-number summary for your class data.
- c. Create a box plot to represent your class data.
- d. Calculate the mean and five-number summary for the national data.
- e. Create a box plot to represent the national data.
- f. Compare and contrast the data sets. (Remember to compare both central tendencies and variability. Use your statistics vocabulary words.)

Note that you will have a chance to finish this activity in the next lesson.

- **1.** Statistical question:
- 2. Complete the table below.

	Class Data	National Data
Mean		
Five-Number Summary		

3. Class data box plot:



LESSON 2 • HOW DO WE COMPARE?: PART I

4. National data box plot (make sure to use the same scale as in the class data box plot):

5. Use the table below to compare and contrast the data sets. Use statistics vocabulary.

	Class Data	National Data
Central Tendency Differences		
Variability Differences		
Central Tendency Similarities		
Variability Similarities		

6. What observations can you make about how your class compares with the national data? Is there anything typical about your class? Do you notice anything unique to your class? What reasons do you think there might be for any differences?



LESSON 3

HOW DO WE COMPARE?: PART II

WARM-UP

Compare Box Plots

The box plots below summarize the ages of leading actress and leading actor Academy Award winners.



Best Actor and Best Actress Awards by Age

(Source: <u>http://en.wikipedia.org/wiki/List_of_Best_Actor_winners_by_age_at_win</u> <u>https://en.wikipedia.org/wiki/List_of_Academy_Award_Best_Actress_winners_by_age</u>)

- 1. Which has a bigger range—the ages of best actors or best actresses? Or, is it not possible to tell from this graph?
- 2. Give evidence that supports the claim that it is harder for an older actress to win an Academy Award than it is for an older actor.

Remember to update your Sleep Log.

PROJECT ACTIVITY

How Do We Compare to Others across the Country?

1. Continue to work on the class versus national data comparison from the previous lesson.



CHECK FOR UNDERSTANDING

Test your knowledge of interpreting box plots using the Check for Understanding • Compare Data Sets.



CULMINATING PROJECT

CLASS PROFILE

PROJECT ACTIVITY

Work on the Culminating Project

• Finish your work on the Class Profile Culminating Project. Make sure you have completed all the items on the Class Profile Culminating Project checklist and assessed your project using the rubric (both the checklist and rubric are from Learning Task 1, Lesson 1).



GROUP PREVIEW

Work with your group to test your knowledge of statistical questions.



INDIVIDUAL PERFORMANCE TASK

Test your knowledge of statistics, including dot plots, box plots, measures of central tendency, and measur of variation.