

Inspect

CCR Performance Task

**Math Grade 6: Represent and Interpret
Data**

Inspect offers the following assessment products:

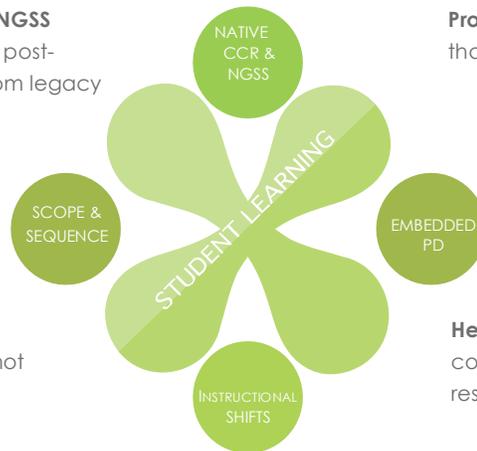
Content Bank for English/Language Arts and Math Grades 2 – High School	<ul style="list-style-type: none"> ▪ More than 36,000 items ▪ More 1500 complex texts, including authentic permissioned texts ▪ Includes Literacy in History, Social Science, Science, and Technical Subjects
Quick Checks for English/Language Arts and Math Grades 2 – High School	<ul style="list-style-type: none"> ▪ Fixed-form assessments with five to seven items including constructed response ▪ Key instructional concepts embedded in standards (clusters for Math, staircase of text complexity for ELA)
Focused Interim Assessments for English/Language Arts and Math Grades 3 – High School	<ul style="list-style-type: none"> ▪ Prebuilt assessments with up to 15 items that focus on groups of related standards within a Claim or domain ▪ More focused than summative assessments ▪ Flexible and customizable ▪ Mirrors SBAC IAB blueprints
NGSS Formative Assessments Grades 5 – High School	<ul style="list-style-type: none"> ▪ Prebuilt assessments with items linked to experimental contexts that assess the three dimensions of science learning ▪ Flexible and customizable ▪ Addresses the California Course Models and NGSS Bundles
Observational Tasks for English/Language Arts and Math Grades K - 1	<ul style="list-style-type: none"> ▪ Developmentally appropriate for individual students and small groups

Inspect Assessment Content is available through a variety of assessment administration and data analysis platforms.

Inspect assessment content offers these benefits:

Native college- and career-ready and NGSS content prepares students to meet their post-secondary goals. Content re-aligned from legacy standards cannot do this.

Content that addresses your scope and sequence so that your assessments do not waste valuable instruction time



Professional development embedded within content that

- shows the relationship between specific skills and higher-order thinking
- includes authentic, permissioned texts of appropriate complexity
- and documents student progress using DOK and learning progressions

Help for teachers addressing the instructional shifts with content that elicits evidence of learning from each response

CCR Performance Tasks

Math Grade 6: Represent and Interpret Data

Student Test Booklet

Name:

Math Grade 6: Represent and Interpret Data

Student Rubric

This problem is meant to test if you can:

- Use data displays to accurately represent data;
- Interpret data.

Your teacher will rate your answer as a level 4, 3, 2, 1, or 0. The descriptions below explain the types of answers expected at each level.

Level 4:

Your answer is correct and complete.

Your answer includes:

- A correct and complete data display that accurately represents the data. Be sure to include a title, labels, and appropriate scales on each axis;
- A correct interpretation that is fully explained with specific references to the data.

Level 3:

Your answer is correct but your data display or your explanation is incomplete.

Your answer includes:

- A correct but maybe incomplete data display;
- A correct interpretation of the data but an incomplete explanation of how your statement is supported by the data.

Level 2:

You have answered only one part correctly, or you have some errors in both parts.

Your answer may include:

- A data display that is partially correct but has errors;
- A missing or weak interpretation of the data.

Level 1:

Your answers are incorrect.

Your answer may include:

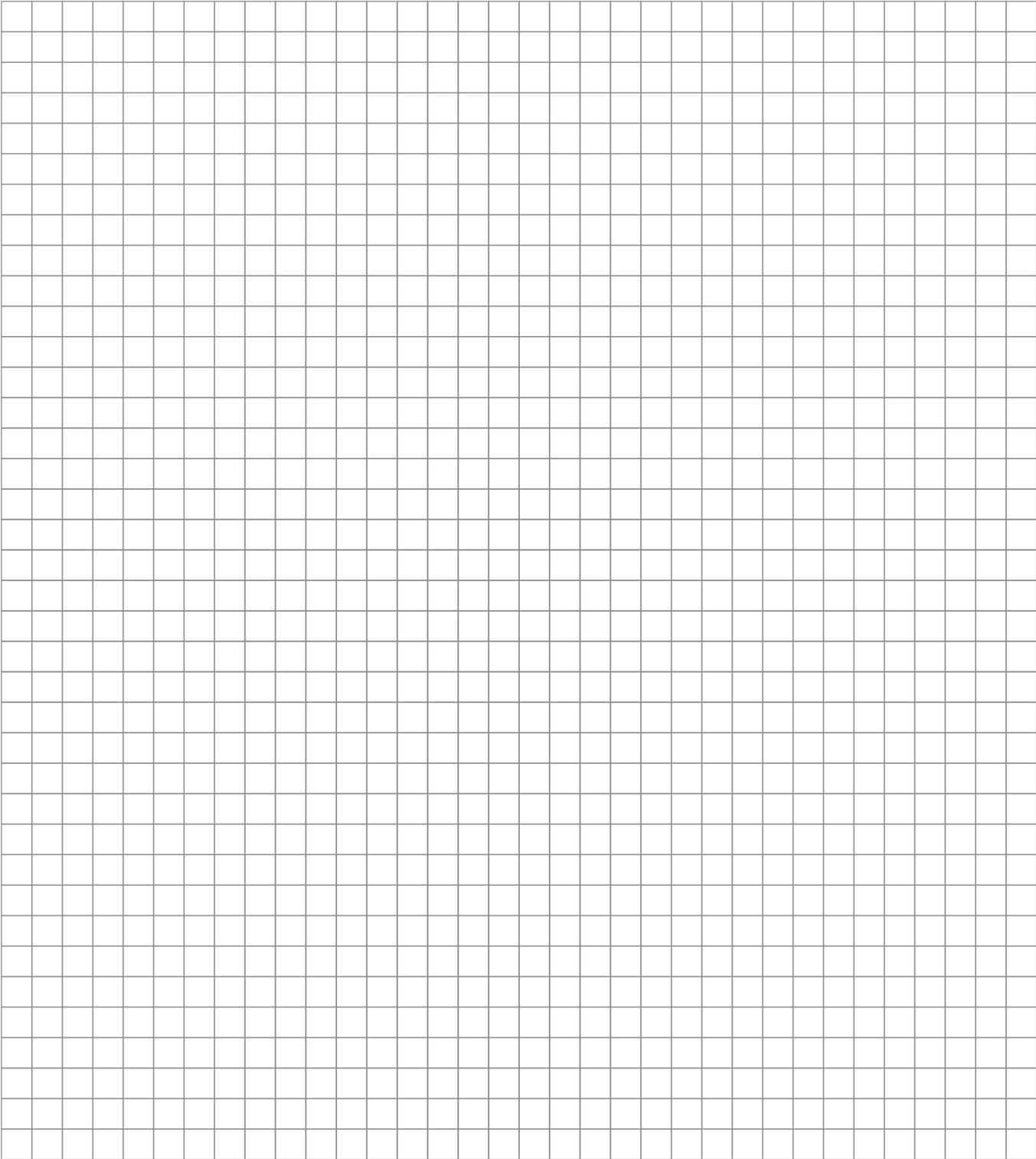
- A missing or incorrect data display;
- A missing or incorrect interpretation of the data.

Level 0:

Your answer is not related to the question, the teacher cannot understand your answer, or you do not write anything.

Name: _____

Math Grade 6: Represent and Interpret Data



CCR Performance Tasks

Math Grade 6: Represent and Interpret Data

Teacher Guide

About the Teacher Guide

This document contains support materials for “Math Grade 6: Represent and Interpret Data.” This includes:

- (a) The task
- (b) The standards and depth of knowledge level of the task
- (c) The scoring rubric
- (d) Discussion questions
- (e) Extension activities

These specifications have been included to help you connect the task to the Common Core content standards and the standards for mathematical practice. The rubric is designed to help you look for the development of mathematical practices in student work. It is also here to help you look for consistencies in student content errors that can help guide intervention and re-teach strategies.

Test Definition File

Item #	Correct Answer	Practice Standard	Content Standards
1	See Scoring Rubric	Mathematical Practice 4	6.SP.4

SBAC Claims	PARCC Sub-Claims
1 and 4	A and D

Performance Task

The table below shows the percentages of people in different age ranges who voted in the 2008 election.

Age in Years	Percent Who Voted
18 to 24	48.5
25 to 34	57.0
35 to 44	62.8
45 to 54	67.4
55 to 64	71.5
65 to 74	72.4
75 and older	67.8

A. Create a histogram that correctly represents the data. Use the graph paper provided.

B. Describe one trend that you see in the data. Cite specific examples from the data that support the trend you describe.

Standards Alignment

Practice Standards

MP4 > DOK 3

Model with mathematics. -- Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Content Standards

6.SP.4

Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

SBAC Claims

Mathematics Claim #1:

Concepts and Procedures. Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.

Mathematics Claim #4:

Modeling and Data Analysis. Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.

PARCC Sub-Claims

Sub-Claim A:

Major Content with Connections to Practices. The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.

Sub-Claim D:

Highlighted Practice MP.4 with Connections to Content: modeling/application. The student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or, for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them (MP.1), reasoning abstractly and quantitatively (MP.2), using appropriate tools strategically (MP.5), looking for and making use of structure (MP.7), and/or looking for and expressing regularity in repeated reasoning (MP.8).

Scoring Rubric

4 Point Response:

The student response demonstrates:

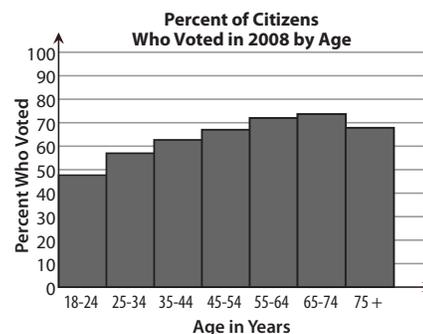
- A strong ability to create a histogram to accurately represent data (part A);
- A strong ability to interpret data, analyze relationships, and draw conclusions (part B).

A level 4 response should include:

- A correct and complete histogram including a title, appropriate scales for both the x- and y-axes, and appropriate labels for both axes;
- A correct trend that is clearly supported by the data.

A sample correct answer follows.

Part A:



Part B: "In general, people who are older are more likely to vote. The one exception is people over 75. This is supported by the data. Looking at the histogram, you can see that the bars get taller as you move right along the x-axis. For example less than 50% of people between 18 and 24 voted, but over 55% percent of people 25 to 34 voted and over 60% of people 35 to 44 voted. It keeps going like that until the last group where it goes down a little but is still pretty high."

3 Point Response:

The student response demonstrates:

- A strong understanding of how to use a histogram to represent data, with minor errors on the histogram such as a missing title, a missing axis label, or a bar with an incorrect height;
- A strong ability to interpret data, analyze relationships, and draw conclusions.

2 Point Response:

The student response demonstrates:

- A basic understanding of how to create a histogram. The histogram contains multiple errors such as incorrect labels, incorrect ranges, inconsistent scale, or more than one bar of incorrect height;
- A basic ability to interpret data, analyze relationships, and draw conclusions. The student may state a trend but not clearly support the statement using the data.

1 Point Response:

The student response demonstrates:

- A weak understanding of how to create a graph to display data. The student may use a graph that is not a histogram or not correctly represent the data;
- A weak ability to interpret data, analyze relationships, and draw conclusions. The student may state a trend that is not supported by the data or otherwise misinterpret or misuse the data.

0 Point Response:

Student provides no response, or response is off topic.

Discussion Questions

Use the following questions to stimulate discussion:

1. What is the difference between a histogram and a bar graph?

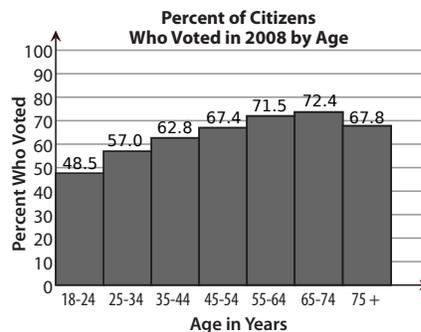
Possible Response: Both graphs use bars. A histogram represents numerical data and there should not be gaps in the x-axis scale. A bar graph represents categorical data and the bars should be separate from each other, not touching.

2. What is an appropriate scale for the y-axis?

Possible Response: The two best options for the y-axis are to (1) choose a scale of 10 (as shown in the rubric), which allows the student to graph all of the data within a 10x10 space. However, if a broken axis is used then (2) the scale could go by 2s, starting at 46, and then the differences in the bars would be more exaggerated.

3. How accurately should we try to graph the height of each bar?

Possible Response: Since the data are given in decimal numbers to tenths, it would be very difficult to graph the exact values of each age group. Since the data are reasonably spread out it is appropriate to graph the bars approximately (as shown in the rubric). One way to show the exact data values is to label each bar with its value at the top of the bar:



4. How might you explain the trend(s) you found in the data?

Possible response: As people age they become more involved in politics and more invested in the outcomes of elections. One reason for the decline in voting by citizens over 75 could be the fact that many people of this age stop driving, which could limit their ability to physically get to a voting station.

Extension Activities

1. Discuss and represent regional voting data

Region	Percent Voted
Northwest	62.9
Midwest	66.3
South	62.6
West	63.3

A. How are these data similar to and different from the voting data by age?

Possible response: *One important difference is that these data are categorical, while the voting by age data was numerical.*

B. What type of data displays would you use to represent these data? What advantages or disadvantages are inherent in each type?

Possible response: *A bar graph is easy to read; you could show the percents over on a map with the different regions highlighted. That would give more information about the categories.*

C. What trends do you see in the data? What additional information would make it easier for you to determine trends?

Possible Sample response: *According to the data, the midwest has a higher percentage of voters than any other region. This is a very small data set; helpful additional information might be more than one year's set of percentages.*

2. Discuss and represent other voting data from the census website:

(<http://www.census.gov/prod/2010pubs/p20-562.pdf>)

Note that some data could raise sensitive issues related to citizenship, race, gender, and income. One alternate data set from this source is shown below, where the same questions can be applied from the previous activity.

Voting Rates by Educational Attainment

Educational Attainment	Percent Voted
Less than high school graduate	39.4
High school graduate or GED	54.9
Some college or associate's degree	68.0
Bachelor's degree	77.0
Advanced degree	82.7