

# Real Data!

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<b>Strand:</b>	Probability and Statistics
<b>Topic:</b>	Gathering and organizing data to construct graphs
<b>Primary SOL:</b>	2.15 The student will collect, organize, and represent data in pictographs and bar graphs read and interpret data represented in pictographs and bar graphs
<b>Related SOL:</b>	2.14

## Materials

- Category Sheet (attached)
- Pictograph Categories (attached)
- Data Collection Sheet 1:1 (attached)
- Data Collection Sheet 2:1 (attached)
- Data Collection Sheet 5:1 (attached)
- Data Collection Sheet 10:1 (attached)
- Pictograph Symbols: Social Studies (attached)
- Pictograph Symbols: Mathematics (attached)
- Pictograph Symbols: Language Arts (attached)
- Pictograph Symbols: Science (attached)
- Pictograph Chart (1:1) activity sheet (attached)
- Pictograph Chart (2:1) activity sheet (attached)
- Pictograph Chart (5:1) activity sheet (attached)
- Pictograph Chart (10:1) activity sheet (attached)
- Bar Graph (1:1) (attached)
- Apples Sold (5:1) activity sheet (attached)
- Apples Sold (2:1) activity sheet (attached)
- Miller Market Apples Sold activity sheet (attached)
- Scissors
- Glue
- Pencil

## Vocabulary

*axis, bar graphs, categories, chart, data, pictographs, represented, table, tallies, title*

## Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Say, “Today, we are going to be collecting data, learning how to organize the data, and representing the data for our principals to understand what subject our class likes the most. The purpose of the graph is to represent the data that we gather to answer the question: What subject do most students like in our class?”  
“I can” statement: I can collect, organize, and represent data to answer a question.
2. Say, “All pictographs and bar graphs have titles. What would a good title be for our graph? Turn and talk to your neighbor about what you think the title should be.” ... “Now I am

going to show you three choices. (See labels below.) If you think choice 1 was closest to what your group discussed, then raise one finger. If the second option was something that was close to what your group discussed, then put up two fingers. If choice 3 was what your group said, put up three fingers.” All students should chose option one.

Put the following on sentence strips that can be cut out and displayed or shown electronically:

Choice 1: Our Favorite Subject

Choice 2: Our Favorite Pet

Choice 3: Our Favorite Candy

3. Say, “First, we are going to be creating a pictograph and a bar graph. A pictograph uses pictures or symbols to represent one or more objects. For example, these are the pictures/symbols that we are going to use to represent our data.”

**Social Studies** could be represented by a globe:



**Math** could be represented by addition and subtraction symbols:



**Language Arts** could be a book:



**Science:**



3. Say, “We are going to be looking at only these four subjects. These subjects are called categories. We need to organize the categories on a graph so we can add data to each category.” (Students will need all four category sheets and one pictograph template seen below.) Ask students to cut apart and make piles of like categories and put their name at the top of the pictograph template.
4. Now ask, “How can we collect data to show how many students like each subject?” Students should remember how to tally from first grade (1.12). Have students sit in a circle. Ask, “Who likes math?” Model for the students how to make that number into tallies. Students will record the results. Go through each of the categories and have students collect the data on the data sheet. They can use numbers or tallies.
5. Say, “Now it is time to take the data and create a pictograph. A pictograph is represented by pictures or symbols. Today we are going to cut out some pictures and glue them on the graph to represent how many students like each subject.” (This is 1:1. You may be able to skip this lesson if students are ready for 2:1, 5:1, or 10:1. There are templates to allow for differentiation and to meet the requirements of the standard.)

### Assessment

- Questions

- If every two students represented one symbol, how many symbols would we need for math?
- If every five students represented one symbol, how many symbols would we need for language arts?
- If every 10 students represented one symbol, how many symbols would we need for science?
- Why do you think people who collect data use symbols to represent more than one?
- Why do you think we use pictographs and bar graphs to represent data?
- **Journal/writing prompts (include a minimum of two)**
  - Write about a time when you think creating a pictograph would be useful to the reader. Show examples of a pictograph. Include a title, pictures or symbols, and a key.
  - Create a pictograph or bar graph on who likes chocolate, strawberry, vanilla ice cream or all three flavors. Be sure to include the title and a key. Create the key based on one symbol equals five students.
- **Other Assessments (include informal assessment ideas)**
  - Show me how you would collect data for who likes tacos or pizza best for lunch.
  - Read the data and share what you think the pictograph means. (Give students a completed pictograph)
  - Use the Apple handout to have student interpret data and to make comparisons and generalizations.

#### **Extensions and Connections (for all students)**

- Have students create a pictograph on any topic at home. Have students show the data collection, write about how they organized the data, and represent the data in a pictograph or bar graph.
- What other subject would pictographs or bar graphs be useful in? Why?

#### **Strategies for Differentiation**

- Use the templates to differentiate based on readiness, product, and task.
- Use pictures for students who may need assistance with drawing symbols or for those students who will want to spend a lot of time on symbols.
- Redirection and corrective feedback should be given throughout lesson.

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

## Category Sheet

Our Favorite Subject

Our Favorite Pet

Our Favorite Candy

## Pictograph Categories

**Social Studies** 




**Math** + -

**Language Arts** 

**Science** 




### Data Collection Sheet (1:1)

Add tallies below. One tally for each student.

Social Studies 	+ -		Science 




### Data Collection Sheet (2:1)

Add tallies below. One tally for every two students.

Social Studies 	+ -		Science 

### Data Collection Sheet (5:1)




Add tallies below. One tally for every five students.

Social Studies 	+ -		Science 



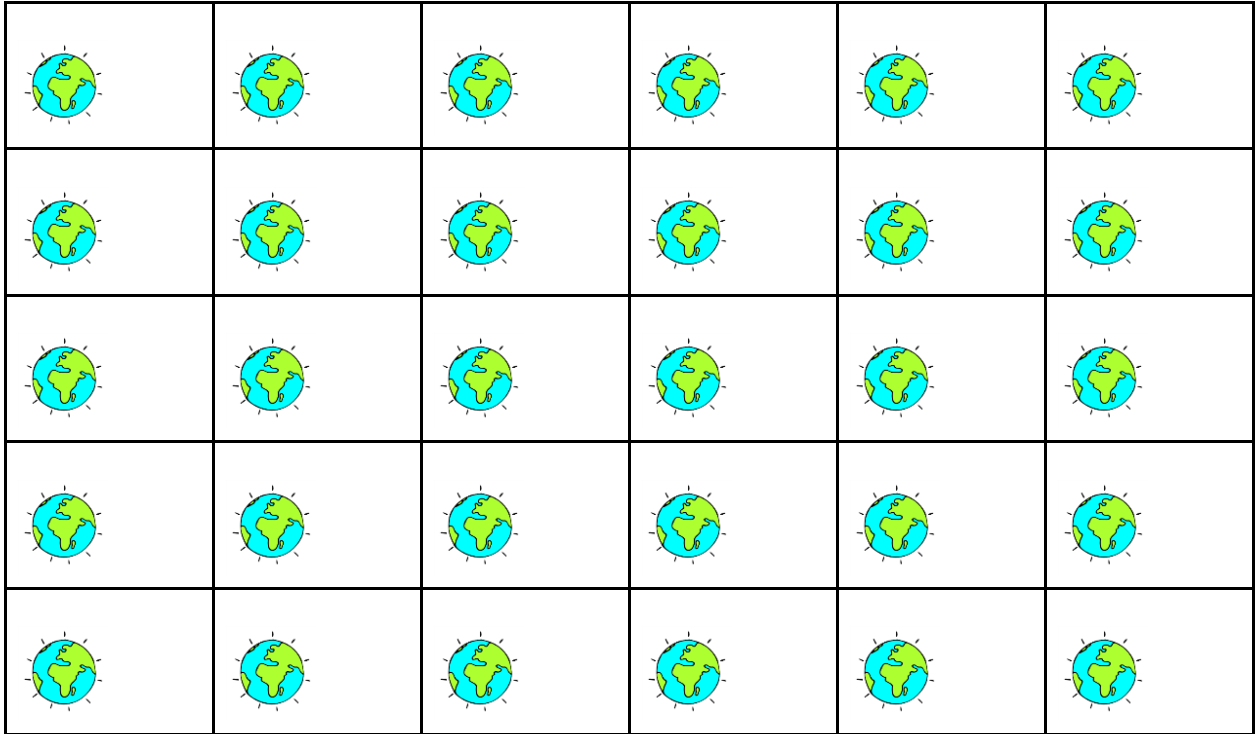
### Data Collection Sheet (10:1)

Add tallies below. One tally for every 10 students.

Social Studies 	+ -		Science 

## Pictograph Symbols: Social Studies

Cut symbols apart.



## Pictograph Symbols: Mathematics

Cut symbols apart.

$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$
$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$
$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$
$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$
$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$	$+$ $-$

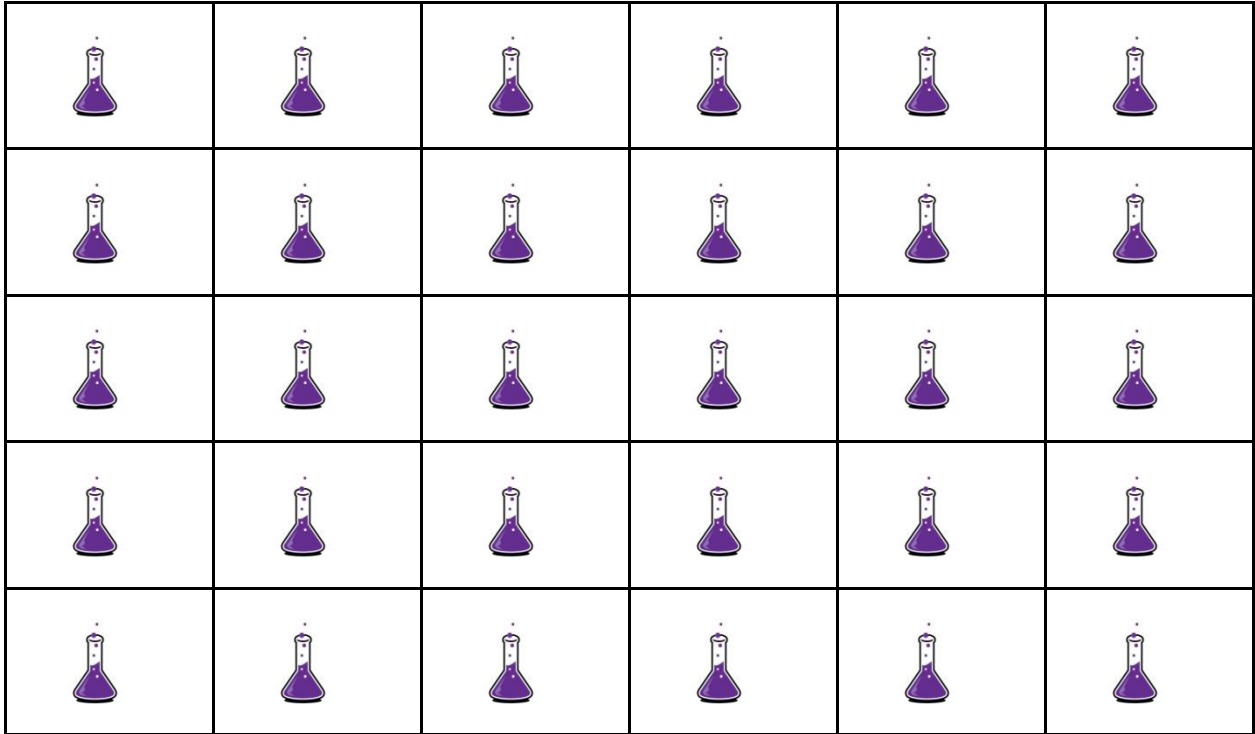
## Pictograph Symbols: Language Arts

Cut symbols apart.



## Pictograph Symbols: Science




Cut symbols apart.



## Pictograph Chart 1:1

Name: \_\_\_\_\_

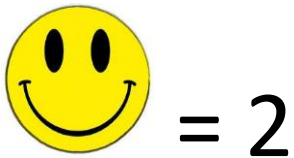
Title of graph: \_\_\_\_\_

	$+$ $-$		

## Pictograph Chart 2:1

Title of graph: \_\_\_\_\_

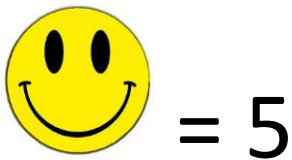
Social Studies	Math	Language Arts	Science



### Pictograph Chart 5:1 (attached)

Title of graph: \_\_\_\_\_

Social Studies	Math	Language Arts	Science

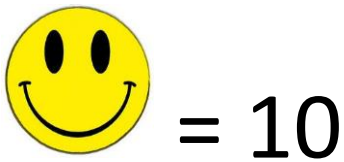




## Pictograph Chart (10:1)

Title of graph: \_\_\_\_\_




Social Studies	Math	Language Arts	Science



### Bar graph (1:1)

Name: \_\_\_\_\_

Title of graph: \_\_\_\_\_

Social Studies 	+ -		Science 

### Apples Sold (5:1)

Read and interpret data show in a pictograph.



Key:  = 5

How many apples were sold in January? \_\_\_\_\_

Which month sold 10 apples? \_\_\_\_\_

How many apples were sold in February? \_\_\_\_\_

Which month sold the least? \_\_\_\_\_

### Apples Sold

January	
February	
March	

Key:  = 2



How many apples were sold in January? \_\_\_\_\_

Which month sold 10 apples? \_\_\_\_\_

How many apples were sold in March? \_\_\_\_\_

Which month sold the least? \_\_\_\_\_

### Miller Market Apples Sold

January	
February	
March	
April	?

Key:  = 2

Predict how many apples you think sold in April if Miller Market continued the same pattern:

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**Why?**

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