Unit: Represent and Interpret Data

Grade: 3rd

**Purpose:**

The purpose of this formative assessment is to give teachers and students an idea of how well students can apply their understanding of data in a table to draw a scaled picture graph and a scaled bar graph of the data, and also use the information presented in a scaled bar graph to solve one and two step “how many more” and “how many less” problems. Prior to this assessment, students will collect their own data and express it in the form of a data table or chart. Students will also spend some time learning how to read and interpret the information in a table or chart, and looking at picture and bar graphs. After this assessment, students will move on to working on generating their own measurement data with a ruler and displaying that data in a line plot. For this assessment, students will complete two different types of questions–construct/create and scenario-prompt– to demonstrate their ability to correctly draw scaled picture and bar graphs and solve “how many more/less” problems. Once the students complete the assessment, the teacher will have individual conferences with each student to discuss both the strengths and areas for improvement in each of the students’ work. The students will also go through their assessment individually and keep a record of the questions they answered correctly and incorrectly. The combination of teacher feedback and self-reflection will give students an idea of how well they know how to construct bar graphs and picture graphs given a set of data, and also assess if they are able to interpret bar graphs to solve “how many more/less” problems about the data presented in a graph.

**Standards/Benchmarks:**

CCSS.MATH.CONTENT3.MD.B.4

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one and two step “how many more” and “how many less” problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

|  |  |
| --- | --- |
| Learning Targets | Test Items |
| I can draw a **scaled picture graph** using data. | Question 2 |
| I can draw a **scaled bar graph** using data. | Question 1 |
| I can solve “how many more” problems using information in a **bar graph**. | Question 1 |
| I can solve “how many less” problems using information in a **bar graph**. | Question 1 |

**Directions:**

\*\* The following directions are to be read aloud to the students before they take the assessment.\*\*

Over the past few weeks, we have spent some time working with how to read and interpret data in tables and looking at picture and bar graphs of data. Now that we know how to record data in a table and we have practiced making picture and bar graphs using a data table, we are going to check how well you can use data in a table to draw picture and bar graphs on your own and then use the graphs to solve problems. Once you finish this assessment, you are going to go through the questions that you missed and we can talk about it so we can both get an idea of what you may need some help with before we move on to the next unit. This will also show me what I can do to help you to be successful.

This assessment will have 2 parts, and you answer 2 types of questions: create, and scenario-prompt. Each question will be worth 5 points.

When I pass out the assessment, make sure you write your name and the date in the top right corner of your paper. You can write your answers the space provided under each question.

You have until lunch time to finish this assessment, so that gives you about 40 minutes to work on it. If you have questions, you can raise your hand and I will come over to you to answer your question. Once you are done, you can put your paper face-down in the bin on my desk*.* Once you are done, you can choose to work on a worksheet from your work folder that you have not yet finished, or you can use the time to silent read.

Remember, you will not be graded on this; it’s just to show me what you can do. Relax, take your time, and remember YOU’RE ALL ROCKSTARS!!!

**Question 1:** (5 points)

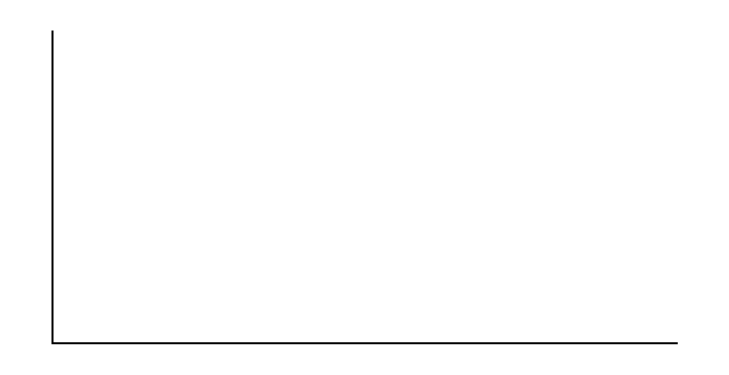
We have spent a lot of time making charts and analyzing them, and then representing the data in a bar graph. In the question below, you will have to read the data in the chart and draw the data in the form of a **bar graph**. Do *not forget to label each part of your graph*! Once you complete your graph, you will use the graph to answer some questions about the data. Read each question carefully, and make sure you justify your answers.

You can read the question more than once if you need to. Be sure to look at the rubric to see what makes a great answer and then write your answer in the blank under each question. You can move on to the next question once you have finished.

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Read the chart below and fill in the number that matches the tally.

|  |  |  |
| --- | --- | --- |
| Favorite Ice Cream Flavors of Students in the Class | | |
| **Flavor** | **Tally** | **Number** |
| Chocolate | ~~IIII~~ III |  |
| Vanilla | ~~IIII~~ ~~IIII~~ IIII |  |
| Strawberry | ~~IIII~~ |  |

Use the data table above to **create and label** a **bar graph** of the data with a **scale of 2.**

Use the bar graph you created to answer the following questions:

1. Which flavor of ice cream is the most popular? How do you know?
2. Which flavor is the least popular? How do you know?
3. How many more students liked Chocolate than Strawberry? How do you know?
4. How many less students liked Vanilla than Chocolate? How do you know?
5. How many students chose Chocolate or Strawberry as their favorite flavor?

|  |  |  |  |
| --- | --- | --- | --- |
|  | I don’t get it.    (1 point) | I need more practice.  (3 points) | I am ready to move on!  (5 points) |
| Graphing | I did not create a graph. | I did not create the right type of graph. | I created the right type of graph (a bar graph). |
| I did not label my graph. | My graph is missing some labels. | I correctly labeled my graph, and I am not missing any labels. |
| I did not know how to use that scale. | I used a different scale (not a scale of 2). | I used the right scale (scale of 2). |
| Problem-solving | I did not use addition and subtraction to compare favorite flavors. | I tried to use addition and subtraction to compare favorite flavors, but I made a small mistake. | I used addition and subtraction to compare favorite flavors, and I did not make any mistakes. |
| Justification | I did not use the data to justify my answers. | I justified my answers using only some data. | I used plenty of data to justify my answers. |

Question 1 Answer Key

**Question 2:** (5 points)

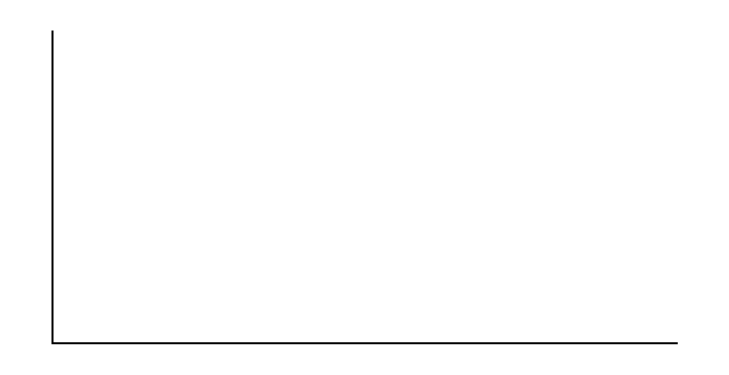
Directions: We have also spent some representing the data from charts in the form of a picture graph. In the question below, you will have to read the data in the chart and draw the data in the form of a **picture graph**. *Do not forget to label each part of your graph*! Once you complete your graph, you will be given a scenario-prompt about the data, and you will have to choose a side. Be sure to read the prompt very carefully.

You can read the prompt more than once if you need to. Be sure to look at the rubric to see what makes a great answer and then write your answer in the blank under each question. Once you have finished, you may turn in your assessment.

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1. A class of students was asked by their teacher what type of pet(s) they have at home. Of all the students in the class, 12 students said they have a fish, 6 students said they have a cat, 9 students said they have a dog, and 3 students said they don’t have any pets at home.

**Draw and label** a **picture graph** of the data. **Use to represent 3 animals.**



1. Use the picture graph you made in part (a) to answer the following question:

When asked if more students had **a fish or a cat** OR **a dog or no pets**, Mary and Josh had different answers. Mary said that more students have a fish or a cat. Josh said more students have a dog or no pets.

Do you agree with Mary or Josh? Justify your choice using the data.

Can you write an explanation to the other person of how to find the right answer?

Question 2 Answer Key

|  |  |  |  |
| --- | --- | --- | --- |
|  | I don’t get it.    (1 point) | I need more practice.  (3 points) | I am ready to move on!  (5 points) |
| Graphing | I did not create a graph. | I did not create the right type of graph. | I created the right type of graph (a picture graph). |
| I did not label my graph. | My graph is missing some labels. | I correctly labeled my graph, and I am not missing any labels. |
| I did not know how to use that scale. | I used a different scale (not a scale of 3). | I used the right scale (scale of 3). |
| Problem-solving | I did not use addition and subtraction to compare Josh and Mary’s answers. | I tried to use addition and subtraction to compare Josh and Mary’s answers, but I made a small mistake. | I used addition and subtraction to compare Josh and Mary’s answers, and I did not make any mistakes. |
| Justification | I did not choose a side.  OR  I did not use the data to justify my choice. | I justified my choice using only some data. | I used plenty of data to justify my choice. |
| I could not explain how to find the right answer. | I wrote a quick explanation of how to find the right answer using some of the data. | I wrote a detailed explanation of how to find the right answer using plenty of data. |

Student Feedback/ Reflection

\*\* For this portion of the assessment, the teacher will meet with each student individually to ask each student for feedback on the assessment. Students will use their indication of how they felt for each question on the assessment to help guide their responses to the feedback questions below. The questioning will be done orally. There is room for teacher notes in the spaces below.\*\*

|  |  |
| --- | --- |
| Which questions were the **easiest** for you? Why? |  |
| Which Questions were the **hardest** for you? Why? |  |
| What can I do to help you understand those questions better? |  |
| Is there anything you want more practice on? |  |

What Now?

Directions: Read the learning targets below and color in the face that describes how well you feel you met the learning target.

|  |  |
| --- | --- |
| I can draw a **picture graph** using data. |  |
| I can draw a **scaled** **bar graph** using data. |  |
| I can solve “how many more” problems using information in a **bar graph**. |  |
| I can solve “how many less” problems using information in a **bar graph**. |  |