



## **CONSTRUCTING TASK: WHAT’S YOUR FAVORITE?**

### **STANDARDS FOR MATHEMATICAL CONTENT:**

**MCC.3.MD.3** 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.

**MCC.3.NBT.2** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

**MCC.3.NBT.3** Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g.,  $9 \times 80$ ,  $5 \times 60$ ) using strategies based on place value and properties of operations.

**MCC.3.NBT.1** Use place value understanding to round whole numbers to the nearest 10 or 100.

### **STANDARDS FOR MATHEMATICAL PRACTICE**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

### **BACKGROUND KNOWLEDGE**

Students were introduced to Venn diagrams in first grade; however, they focused on two-circle diagrams. This task requires students to create a Venn diagram with three circles. It is important for students to have some experiences with Venn diagrams with three circles before working on this task.

### **ESSENTIAL QUESTIONS**

- How can surveys be used to collect data?
- How can surveys be used to answer a question?
- How can graphs be used to display data gathered from a survey?
- How can I analyze data and use what I’ve learned to answer mathematical questions about it?

## **MATERIALS**

- “What’s Your Favorite?, Directions” student sheet
- Paper, markers, crayons, rulers, and other supplies needed to create graphs
- *The Great Graph Contest* by Loreen Leedy or similar book
- “What’s Your Favorite? Data Collection – Favorites” student recording sheet (optional)
- “What’s Your Favorite? Data Collection – Preferences” student recording sheet (optional)

## **GROUPING**

Partner/Small Group Task

## **TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION**

Students survey their classmates to collect data and then display the data using pictographs and Venn diagrams.

This task could be introduced by reading *The Great Graph Contest* by Loreen Leedy or a similar book that uses Venn diagrams and pictographs. (Note: Circle graphs are used in *The Great Graph Contest*, but they are not formally introduced in third grade.) To begin this task, ask the students in the class to brainstorm ideas for categories of student favorites. Some possible ideas are: pet, shoe, color, movie type, animal, dessert, school subject, or sport.

Students should record respondents’ names when collecting data for favorites in order to ensure every student in the class is asked the survey question. Alternatively, a student’s name can be checked off when they answer the survey question.

As a part of the summarizing for this task, each pair (or selected pairs) of students can share the results of their research, presenting their graphs, and explaining the conclusions they drew from the data.

Students will follow the directions below from the “What’s Your Favorite?” directions student sheet. This is your chance to get to know your classmates better! You will work with a partner to research favorites of your classmates and then display the results in pictographs.

### **Pictograph**

- ☐ Choose from the list your class brainstormed, a topic on which you would like to survey your classmates.
- ☐ Write a question for your survey. (Example: What is your favorite pet, bird, cat, or dog?)
- ☐ Create a data collection sheet for **favorites** of your classmates.

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- ☐ Ask each student in your class the survey question and record their responses.  
Students can only have one favorite.
- ☐ Organize the data in a table.
- ☐ Display the data in a pictograph.
- ☐ Write a paragraph to share conclusions you can draw about your classmates' favorites. Justify each conclusion with evidence from your pictograph.

### **Data Analysis**

*Use your data and graphs to create questions that can be asked about your findings. At least one of the questions should be multistep. Then, exchange your questions with another group member and answer them. Ask at least one question about each of the following:*

- ☐ Joining and Combining (Addition)
- ☐ Separating and Comparing (Subtraction)
- ☐ Multiplying by Ten
- ☐ Rounding to the Nearest Ten and Hundred

### **FORMATIVE ASSESSMENT QUESTIONS**

- How many students chose \_\_\_\_\_ as their favorite? How is that displayed in your graph?
- How did you choose the number of students represented by each symbol on your pictograph?
- What does the pictograph tell you about your classmates' favorites?
- How would your data look if it were a bar graph?
- What comparisons can you make using your data using numbers?
- What is the difference between the actual favorites and estimates?

### **DIFFERENTIATION**

#### **Extension**

- Create a book of Class Favorites. Share it on Family Math Night, during parent conferences, etc.
- Create another pictograph. Make your symbol represent a different number than the one you originally chose. Discuss how your pictograph changed.
- Use your data to create a line plot graph.
- Use your data to create a bar graph.

#### **Intervention**

- Some students may require some support in a small group setting to be successful with this task. For example, provide some guidance in narrowing a topic, choosing a graphic representation, and/or scaffolding for creating graphs.
- Allow students to create their graphs using web-based programs. See the links below.
  - [http://www.beaconlearningcenter.com/documents/2351\\_5255.pdf](http://www.beaconlearningcenter.com/documents/2351_5255.pdf) Template that can be printed and used to create a pictograph

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- <http://gwydir.demon.co.uk/jo/numbers/pictogram/pictogram.htm> Web-based program that allows students to create pictographs
- [http://faculty.kutztown.edu/schaeffe/Excel/Vallone/Vallone\\_Excel.pdf](http://faculty.kutztown.edu/schaeffe/Excel/Vallone/Vallone_Excel.pdf) Directions to create a pictograph using excel

**TECHNOLOGY CONNECTION**

- If students are having difficulty thinking of a question, these websites have many ideas:
  - <http://www.canteach.ca/elementary/numbers13.html>
  - [http://www.uen.org/lessonplan/upload/10867-2-14587-graphing\\_ideas.pdf](http://www.uen.org/lessonplan/upload/10867-2-14587-graphing_ideas.pdf)
- <http://www.shodor.org/interactivate/activities/BarGraphSorter/> Create bar graphs based on random sets of shapes.



Name \_\_\_\_\_ Date \_\_\_\_\_

## What's Your Favorite?

### Directions

This is your chance to get to know your classmates better! You will work with a partner to research favorites of your classmates and then display the results in a pictograph.

### Pictograph

1. Choose from the list your class brainstormed, a topic on which you would like to survey your classmates.
2. Write a question for your survey. (Example: What is your favorite pet, bird, cat, or dog?)
3. Create a data collection sheet for **favorites** of your classmates.
4. Ask each student in your class the survey question and record their responses. Students can only have one favorite.
5. Organize the data in a table.
6. Display the data in a pictograph.
7. Write a paragraph to share conclusions you can draw about your classmates' favorites. Justify each conclusion with evidence from your pictograph.

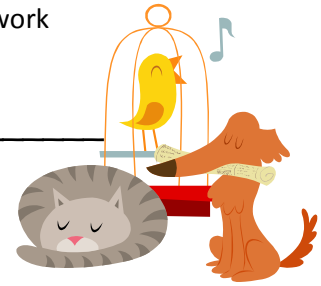
### Venn Diagram

- ☐ Choose from the list your class brainstormed, a topic on which you would like to survey your classmates.
- ☐ Write a question for your survey. (Example: What types of pets do you like: bird, cat, or dog?)
- ☐ Create a data collection sheet for **preferences** of your classmates.
- ☐ Ask each student in your class the survey question and record their responses. Students can like more than one of the choices.
- ☐ Display the data in a Venn diagram.
- ☐ Write a paragraph to share conclusions you can draw about your classmates' preferences. Justify each conclusion with evidence from your Venn diagram.

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Name \_\_\_\_\_ Date \_\_\_\_\_

**What's Your Favorite?**  
**Data Collection - Favorites**



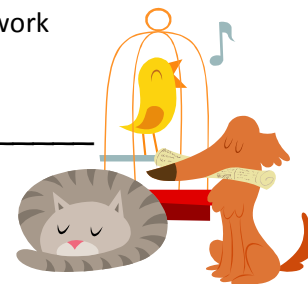
What is your favorite \_\_\_\_\_?

| What is your favorite<br>_____<br>(Choose One) | Student Names |
|------------------------------------------------|---------------|
| 1.                                             |               |
| 2.                                             |               |
| 3.                                             |               |

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Name \_\_\_\_\_ Date \_\_\_\_\_

**What's Your Favorite?**  
**Data Collection - Preferences**



Do you like \_\_\_\_\_?

| Do you like<br>_____<br>(May choose more than<br>one.) | Student Names |
|--------------------------------------------------------|---------------|
| 1.                                                     |               |
| 2.                                                     |               |
| 3.                                                     |               |