Just in Time Quick Check

Standard of Learning 1.PS.1

Strand: Probability and Statistics

Standard of Learning 1.PS.1

The student will apply the data cycle (pose questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on object graphs, picture graphs, and tables.

Students will demonstrate the following Knowledge and Skills:

a) Sort and classify concrete objects into appropriate subsets (categories) based on one or two attributes, such as size, shape, color, and/or thickness (e.g., sort a set of objects that are both red and thick).

b) Describe and label attributes of a set of objects that has been sorted.

c) Pose questions, given a predetermined context, that require the collection of data (limited to 25 or fewer data points for no more than four categories).

d) Determine the data needed to answer a posed question and collect the data using various methods (e.g., counting objects, drawing pictures, tallying).

e) Organize and represent a data set by sorting the collected data using various methods (e.g., tallying, T-charts).

f) Represent a data set (vertically or horizontally) using object graphs, picture graphs, and tables.

g) Analyze data represented in object graphs, picture graphs, and tables and communicate results:

   i) ask and answer questions about the data represented in object graphs, picture graphs, and tables (e.g., total number of data points represented, how many in each category, how many more or less are in one category than another); and

   ii) draw conclusions about the data and make predictions based on the data.

Just in Time Quick Check

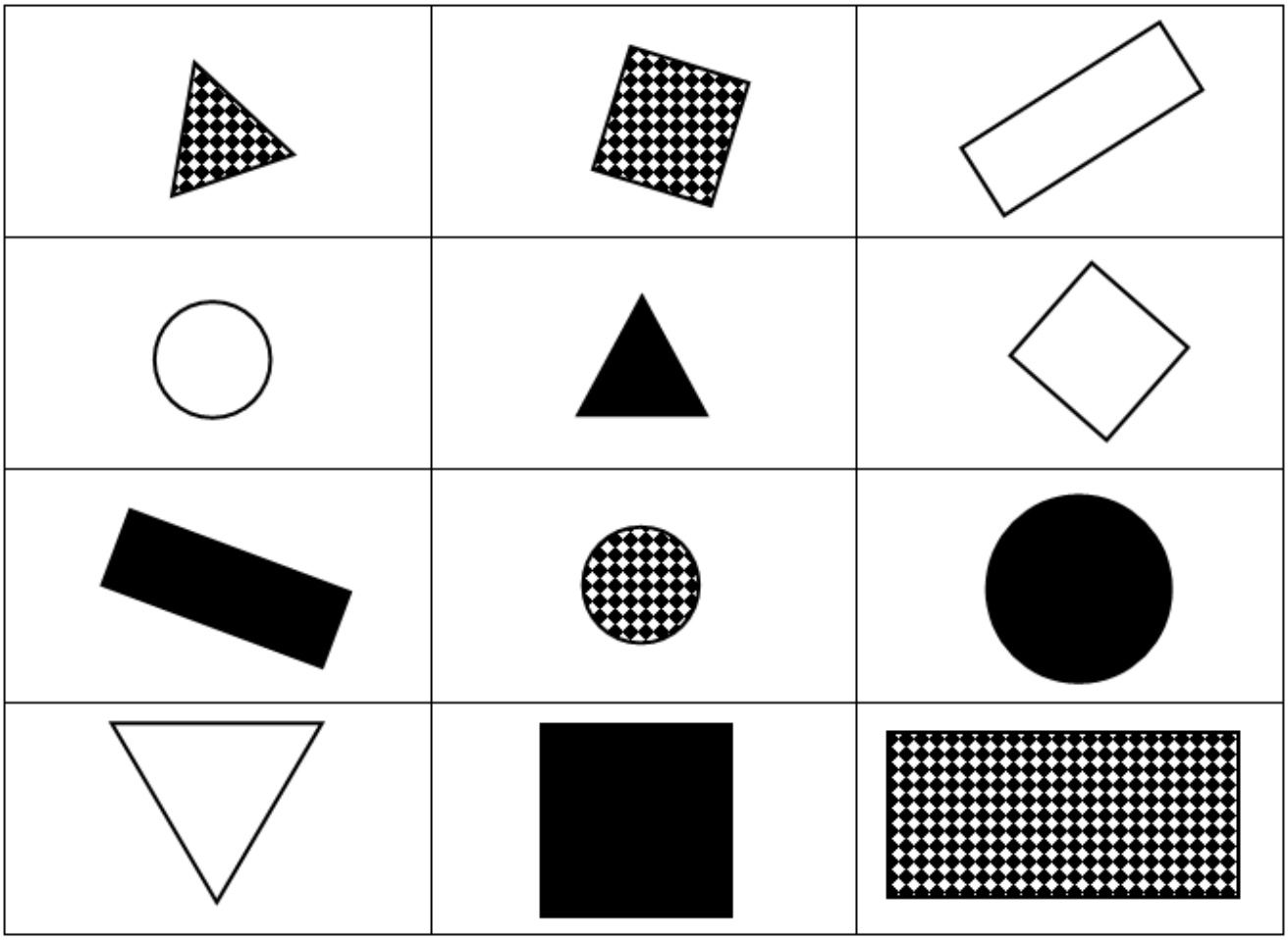
Just in Time Quick Check Teacher Notes

Supporting and Prerequisite SOL: K.PS.1, 1.CE.1

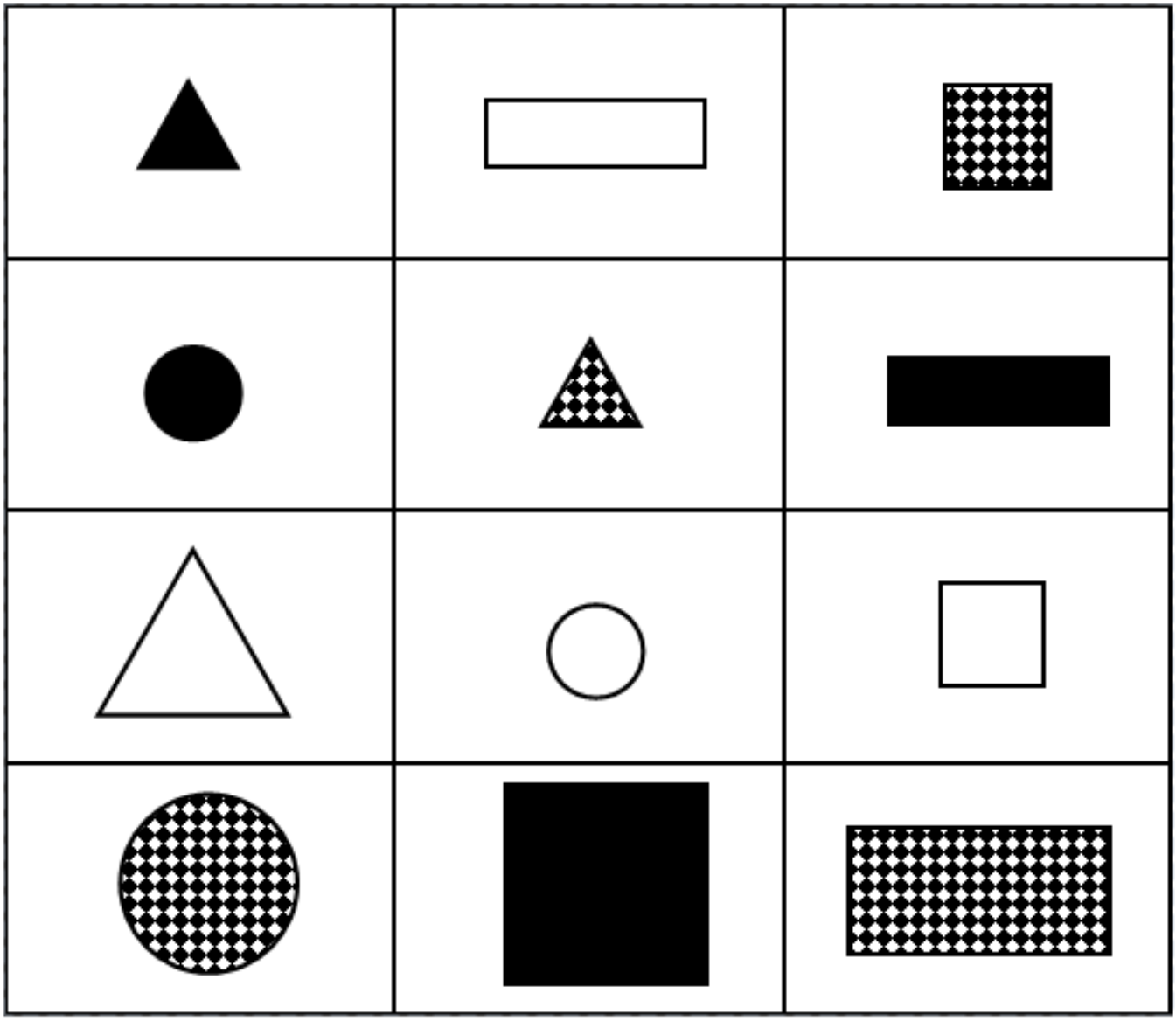
Teacher Note: This quick check is split into two parts, Part A and Part B. To complete Part A, each student will need a pencil and a copy of the "Just in Time Quick Check 1.PS.1: Student Copy" (pages 8 and 9). This part may be completed as a whole group (or teachers may choose to complete Part A with each student individually).

To complete Part B, teachers will need to prepare Set 1 (page 3) and Set 2 (page 4) of the shape cut-outs prior to administering this quick check. Provide sorting boards to students as needed (pages 5 and 6). Have one copy of the "Sorted Shapes" (page 7) prepared. This part should be completed with each student individually.

Shapes – Set 1



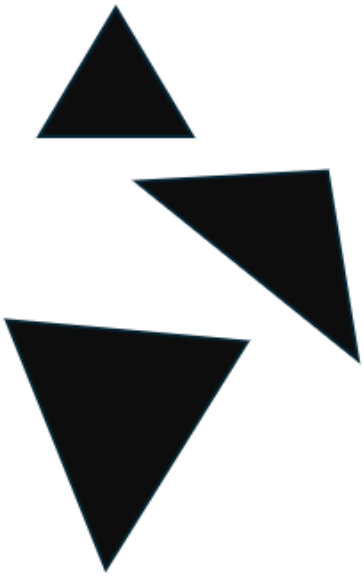
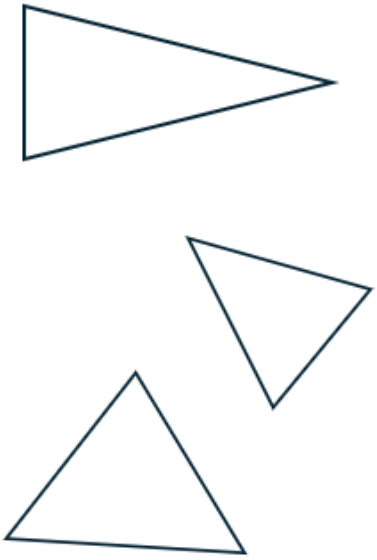
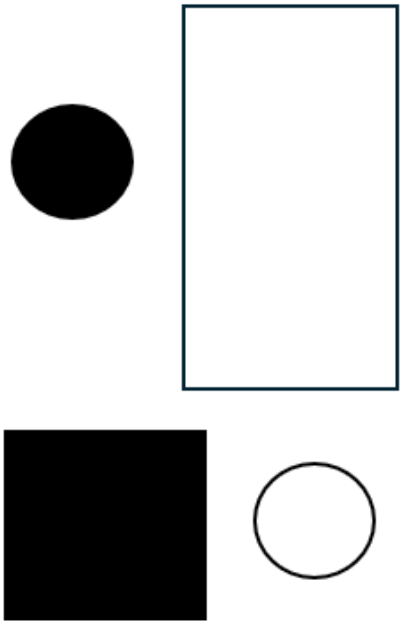
Shapes - Set 2



Group 2	
Group 1	

Group 3	
Group 2	
Group 1	

Sorted Shapes

Group 1	Group 2	Group 3
		

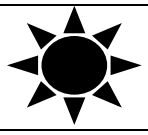
Just in Time Quick Check 1.PS.1: Student Copy

1. A class was asked about their favorite animal.
    - 4 children liked fish.
    - 6 children liked dogs.
    - 2 children liked cats.

   Tally the data in the chart below.

Fish	Dogs	Cats

2. A class records the number of sunny days, rainy days and snowy days in this table.

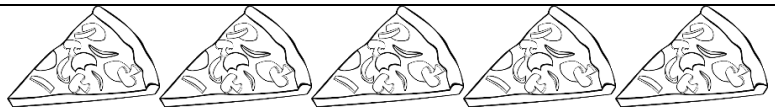
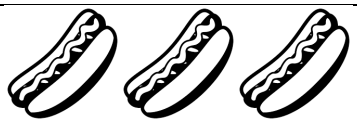
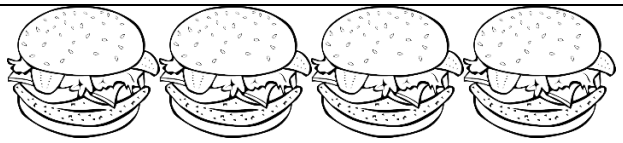
		
2	**3**	**0**

Use the data from the table to create a picture graph.

3. Mrs. Morgan asked her students what they would like to order for lunch and created the following picture graph. Use the picture graph to answer the questions.

Lunch Orders

Pizza	
Hot dog	
Burger	

How many students placed a lunch order? _____

Which food has more orders than burgers? _____

Which food has fewer orders than burgers? _____

4. Mrs. Morgan also asked her students what type of juice they would like with their lunch. Look at the table and use it to answer the questions.

Types of Juice

Orange Juice	Apple Juice	Grape Juice
3	**7**	**2**

_____ juice is liked more than _____ juice.

_____ juice is liked less than _____ juice.

Apple juice is liked by _____ people.

5. To administer this task, provide shape cut-outs (Set 1) to the student. Ask the student to sort the shapes into two groups. Once complete, ask the student to explain how they sorted the shapes. If the student hesitates to explain how they sorted the shapes into two groups, ask, “How are all of these alike? And these?”

   Student Response:

6. To administer this task, provide shape cut-outs (Set 2) to the student. Ask the student to sort the shapes into three groups. Once complete, ask the student to explain how they sorted the shapes. If student hesitates to explain how they sorted the shapes into the three groups, ask, “How are all of these alike? And these? And these?”

   Student Response:

7. To administer this task, show the student the set of sorted shapes (page 7). Ask the student to describe how the shapes have been sorted. If the student hesitates to explain how the shapes are sorted, ask, “How are all the shapes in Group A alike? How are all the shapes in Group B alike? How are all the shapes in Group C alike?”

   Student Response:

8. Mrs. Anderson is going to buy some new activities for recess. She would like to buy activities that the class enjoys doing at recess. What question could she ask the class to gather data about the activities students enjoy?
    - Note: If the student is unable to create a question, offer the following choices. Say: *Should Mrs. Anderson ask:*
        - *What activities do you like to do during recess? or,*
        - *How many times can you jump rope?*

    Student response:

1.PS.1 Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

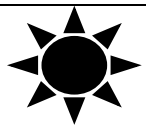
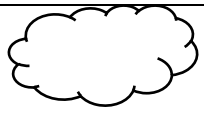
1. A class was asked about their favorite animal.
    - 4 children liked fish.
    - 6 children liked dogs.
    - 2 children liked cats.

   Tally the data in the chart below.

Fish	Dogs	Cats

Some students may struggle to represent the data correctly using tally marks. These students will need additional experience seeing tally marks modeled and using tally marks to represent data. Providing daily opportunities for students to record data using tally marks will be beneficial. Ideas for recording with tallies might include having students record the number of students in their small group who are wearing sneakers or how many students are buying lunch or how many students are wearing striped clothing. Daily class questions can provide the opportunities students need to become comfortable using tally marks to record data.

2. A class records the number of sunny days, rainy days and snowy days in this table.

		
2	**3**	**0**

Use the data from the table to create a picture graph.

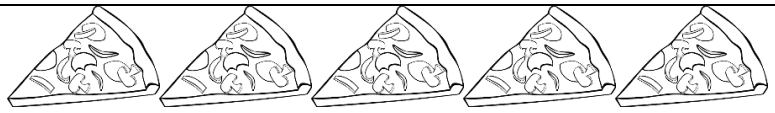
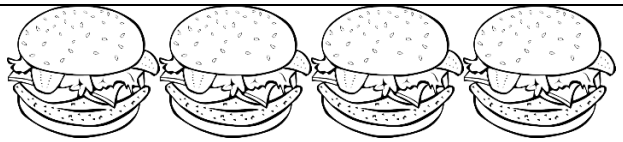
	
	
	

Students who struggle to create a picture graph representing this data may try to make boxes or turn this into a bar graph instead of a picture graph. They may also be confused by the horizontal orientation instead of a vertical orientation. These students would benefit from opportunities to turn object graphs into picture graphs and discuss how they represent the same data.

Some students who have trouble with the concept of zero may still place a snowflake in the snowy day category. Providing students with opportunities to create picture graphs where one or more categories contain zero data points will be beneficial. Classroom discussions focused on what it means when there are no data points in a category will be very beneficial as students make sense of and represent data accurately.

3. Mrs. Morgan asked her students what they would like to order for lunch and created the following picture graph. Use the picture graph to answer the questions.

Lunch Orders

Pizza	
Hot dog	
Burger	

How many students placed a lunch order? _____

Students may say 5, 3, or 4 for this question, indicating that they do not understand that they need to count all the lunch orders together to determine how many people voted. They may just count the lunch order they consider to be their favorite. These students may need more practice with making and reading picture graphs with the whole class and in small groups. Making object graphs with concrete items, and then translating that data to a picture graph, followed by classroom discourse focused on what information a graph tells us, will serve to strengthen students' ability to answer questions related to graphs.

Which food has more orders than burgers? _____

Students may pick hot dogs as the answer. This may indicate that students do understand the concepts of more and less. These students will benefit from additional opportunities to hear and use the vocabulary associated with interpreting data including more, less, fewer, greater than, less than, and equal to.

Which food has fewer orders than burgers? _____

Students who choose pizza as the answer may not understand the concepts of more and less. They may need additional experience building sets of concrete objects that contain more or less than other sets.

4. Mrs. Morgan also asked her students what type of juice they would like with their lunch. Look at the table and use it to answer the questions.

Types of Juice

Orange Juice	Apple Juice	Grape Juice
3	**7**	**2**

_____ juice is liked more than _____ juice.

_____ juice is liked less than _____ juice.

Apple juice is liked by _____ people.

Some students may be able to identify which juice had the most votes but are unable to write a comparison sentence while other students may confuse the terms "more than" and "less than." These students need opportunities to compare data displayed in charts and in object and picture graphs using comparison sentences. It will be beneficial to provide opportunities for these students to engage in discourse focused on comparing data and recording more than, less than sentences. Some students may also benefit from using concrete objects to help when comparing numbers.

5. To administer this task, provide shape cut-outs (Set 1) to the student. Ask the student to sort the shapes into two groups. Once complete, ask the student to explain how they sorted the shapes. If the student hesitates to explain how they sorted the shapes into two groups, ask, "How are all of these alike? And these?"

If a student is unable to sort the shapes into two groups, they may need a prompt to help them focus on an object's attributes. It may be helpful to ask questions like, "What shape is this?" "What attributes make this shape?" It may also be helpful to select two different shapes and ask, "What is the same and what is different about these two shapes?" If students are still unable to answer, limit the number of shapes for sorting to see whether students can sort 4-6 shapes instead of the 12

provided. If students are still unable to sort the shapes into two groups, they will need more opportunities to explore and describe the characteristics of the shapes to determine how they are alike or different.

Another common misconception is confusing shapes or their characteristics based on the orientation of the shape. For example, students may not recognize a triangle sitting on one of its vertices or may label a square as a "diamond" because of its orientation. If students demonstrate either of these misconceptions, they will benefit from additional opportunities to explore and describe shapes displayed in various orientations. When possible, it is best to provide examples that exist in everyday life.

6. To administer this task, provide shape cut-outs (Set 2) to the student. Ask the student to sort the shapes into three groups. Once complete, ask the student to explain how they sorted the shapes. If student hesitates to explain how they sorted the shapes into the three groups, ask, "How are all of these alike? And these? And these?"

   Some students may have trouble sorting according to multiple characteristics or recognizing characteristics beyond obvious general characteristics. If students still have difficulty sorting the shapes into three categories, it may be helpful to try the same activity with a set of attribute blocks that have various colors and shapes and appeal to visual and tactile learners.

   Some students may have difficulty explaining how the set has been sorted or may not apply the rule consistently across all objects in the set.

   Students who are still developing their ability to identify attributes to sort and classify objects will benefit from hearing how others sort and their reasoning. Classification is a necessary skill for many areas in mathematics (e.g., patterning, measurement) and therefore should be revisited throughout the school year. As students develop this skill, it may be helpful to begin first with sorting by one attribute, then by two attributes. In all cases, reasoning should be at the center of all classroom discussions.

7. To administer this task, show the student the set of sorted shapes (page 7). Ask the student to describe how the shapes have been sorted. If the student hesitates to explain how the shapes are sorted, ask, "How are all the shapes in Group A alike? How are all the shapes in Group B alike? How are all the shapes in Group C alike?"

   Students may focus on only one obvious attribute (such as color or size) and overlook the main sorting rule. For example, they might say Group 1 is "big shapes" or Group 2 is "pointy shapes"

instead of noticing that Group 1 contains black triangles, Group 2 contains white triangles, and Group 3 contains shapes that are not triangles. Some students may mix attributes and say the groups are sorted by both shape and color without clearly explaining which feature is most important. Others may struggle to name shapes accurately, especially when they are presented in various orientations. Teachers can support students by prompting them to compare what is the same within each group and what is different across groups, reinforcing that shapes can be sorted by one clear rule at a time, such as shape type or shape color.

8. Mrs. Anderson is going to buy some new activities for recess. She would like to buy activities that the class enjoys doing at recess. What question could she ask the class to gather data about the activities students enjoy?
    - Note: If the student is unable to create a question, offer the following choices. Say: *Should Mrs. Anderson ask:*
        - *What activities do you like to do during recess? or,*
        - *How many times can you jump rope?*

        Students may have difficulty formulating questions that require the collection of data. Students may benefit from the opportunity to discuss a variety of questions and how the answers to those questions could yield data that could be used to create graphs. As students are developing this skill, it may be helpful to provide them with two or three choices of questions that could be asked, and then to facilitate discussions about what type of information would be provided from answering each question.