

**Just in Time Quick Check**  
**Standard of Learning 2.PS.1**  
**Strand: Probability and Statistics**

**Standard of Learning 2.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 pictographs and bar graphs.**

*Students will demonstrate the following Knowledge and Skills:*

- a) Pose questions, given a predetermined context, that require the collection of data (limited to 25 or fewer data points for no more than six categories).
- b) Determine the data needed to answer a posed question and collect the data using various methods (e.g., voting; creating lists, tables, or charts; tallying).
- c) Organize and represent a data set using a pictograph where each symbol represents up to 2 data points. Determine and use a key to assist in the analysis of the data.
- d) Organize and represent a data set using a bar graph with a title and labeled axes (limited to 25 or fewer data points for up to six categories, and limit increments of scale to multiples of 1 or 2).
- e) Analyze data represented in pictographs and bar graphs and communicate results:
  - i) ask and answer questions about the data represented in pictographs and bar graphs (e.g., total number of data points represented, how many in each category, how many more or less are in one category than another). Pictograph keys will be limited to symbols representing 1, 2, 5, or 10 pieces of data and bar graphs will be limited to scales with increments in multiples of 1, 2, 5, or 10; 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**

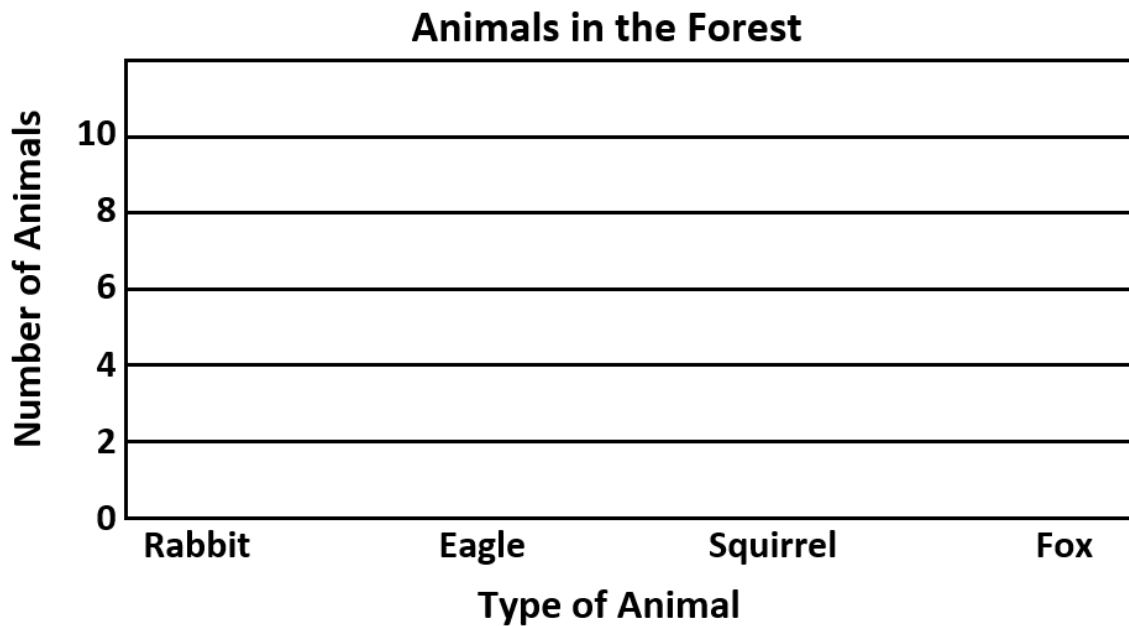
**Supporting and Prerequisite SOL: 1.PS.1, 2.CE.1**

Just in Time Quick Check 2.PS.1

1. James went on a walk in the forest. He made this tally chart of the animals he saw.

Animals	Tally
Rabbit	
Eagle	
Squirrel	++++
Fox	

Use the tally chart to create a bar graph.



2. Create a pictograph using the data in the tally chart. Give the pictograph a title.

Animals	Tally
Rabbit	
Eagle	
Squirrel	
Fox	

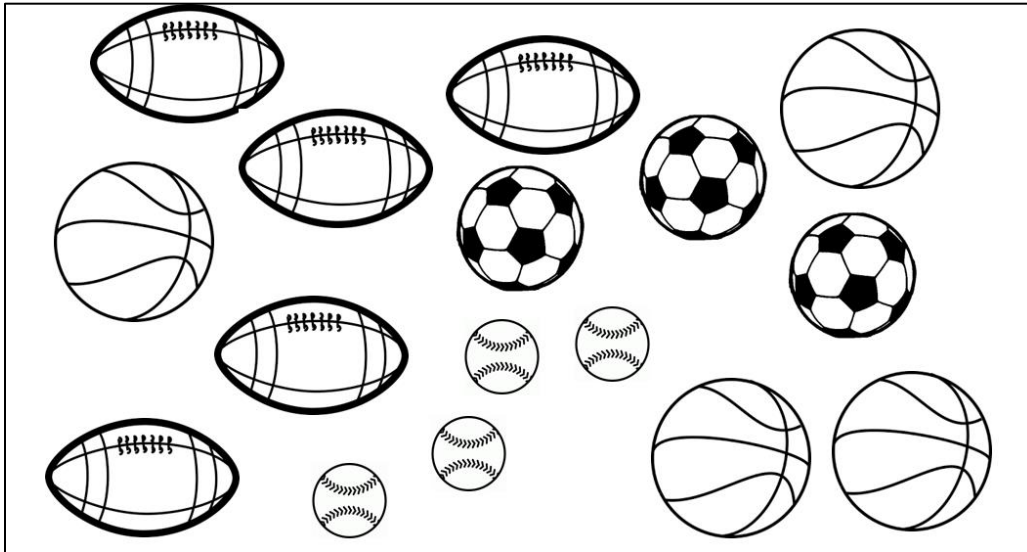
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<b>Rabbit</b>	
<b>Eagle</b>	
<b>Squirrel</b>	
<b>Fox</b>	

Key: ● = 2 animals





3. Emma wants to know if more students in her class ride a bus home or ride an after school van. Write a question she could ask to gather the needed data and create a graph.

4. This picture shows the balls in the school gym.








Complete the tally chart to show the number of each type of ball.


**Balls in the School Gym**

Type of Ball	Tally
Basketball 	
Football 	
Soccer ball 	
Softball 	

5. The pictograph shows the number of animals on a farm. Use the graph to answer the questions.

**Animals on the Farm**

Sheep	
Cows	
Pigs	
Chickens	
Horses	

Key  = 2 animals

- a) What is the total number of animals on the farm? \_\_\_\_\_
- b) Exactly how many more sheep are on the farm than horses? \_\_\_\_\_
- c) The farm has the fewest of which animal? \_\_\_\_\_

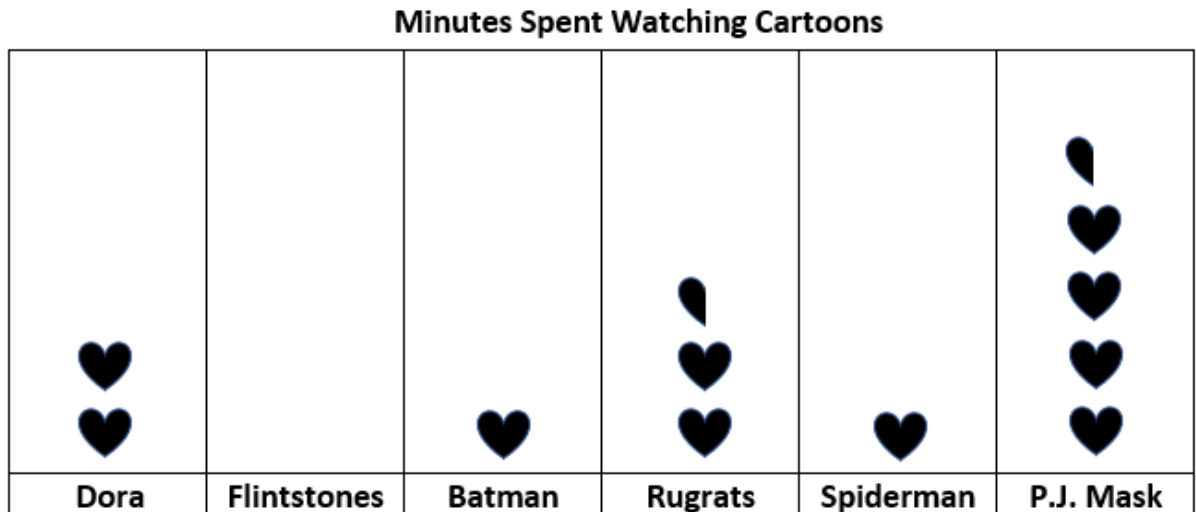
6. Use the bar graph to answer the questions.




a) What is the total number of daisies and tulips in the garden? \_\_\_\_\_

b) Write a sentence comparing the number of sunflowers to another type of flower in this garden.

7. Steven created a pictograph to keep track of how many minutes he was watching his favorite cartoons. Use the pictograph to answer the questions.



Key  = 10 minutes

- a) Which cartoons did Steven watch for the same number of minutes?

\_\_\_\_\_

- b) The cartoon Steven watched the most was \_\_\_\_\_.

He watched this cartoon for exactly \_\_\_\_\_ minutes.

- c) Predict: Which cartoon do you think Steven will watch tomorrow? Explain your thinking.

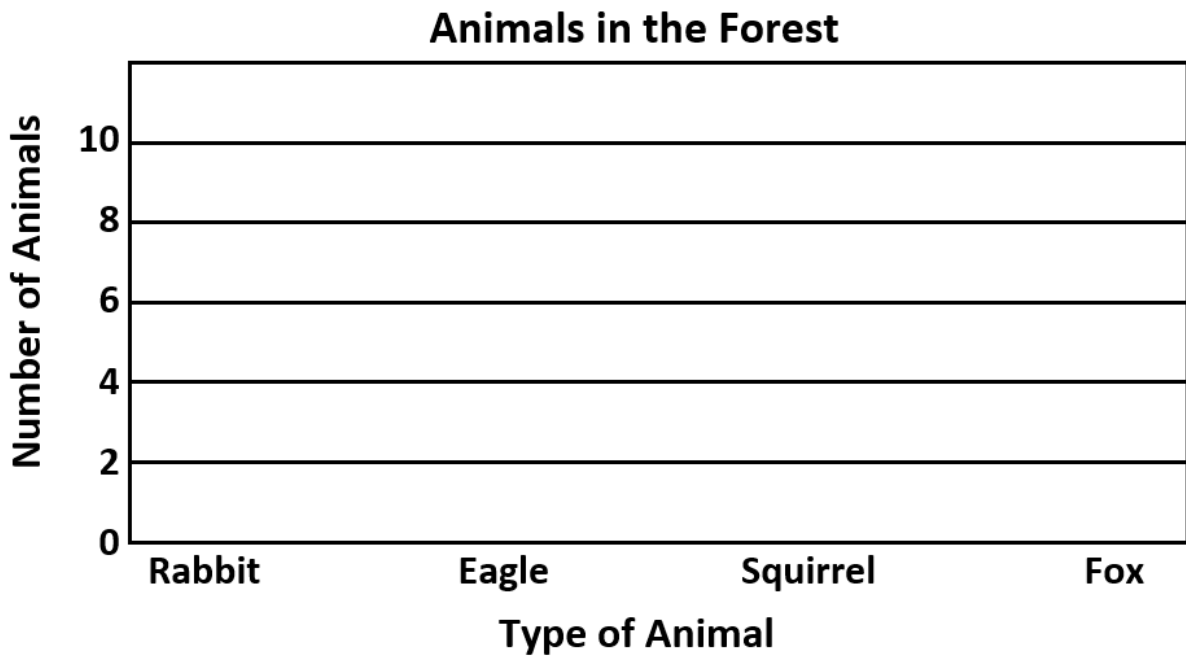
2.PS.1 Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. James went on a walk in the forest. He made this tally chart of the animals he saw.

Animals	Tally
Rabbit	
Eagle	
Squirrel	++++
Fox	

Use the tally chart above to create a bar graph.



*Students may shade a bar next to the animal's name instead of above the names, or they may not leave space between the bars. These students need more experience creating bar graphs to represent data collected.*

*Students may not stop the bar used to represent an odd number halfway between the horizontal lines, which may indicate students do not understand how to use the scale when determining the height of the bar. These students may need more experience creating graphs with different scale increments. Opportunities to first represent the same data on two bar graphs having different scale increments and then compare and contrast the resulting graphs will be beneficial.*

2. Create a pictograph using the data in the tally chart. Give the pictograph a title.

Animals	Tally
Rabbit	
Eagle	
Squirrel	++++
Fox	

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<b>Rabbit</b>	
<b>Eagle</b>	
<b>Squirrel</b>	
<b>Fox</b>	

Key: ● = 2 animals

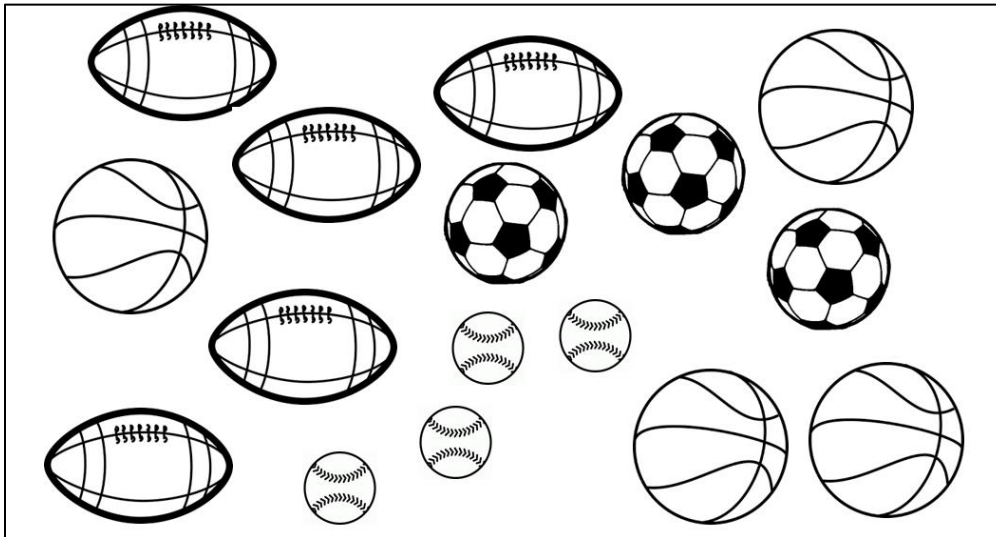
*Students who use the same number of complete circles for each category as the number of animals may not understand how to use the information in the key to represent the number of animals. For example, students may incorrectly draw three ovals to represent the three rabbits. These students may need more experience counting by twos or translating the tallies to a number. Opportunities to use counters to represent the tallies and then group the counters to correspond to the symbol in the key may help students develop an understanding of the relationship between these different representations of the same data. Some students may have difficulty deciding how to represent an odd number of animals using a circle (or oval).*

*Students might represent each category with a different picture. In a pictograph, all symbols remain the same for each category and correspond to the symbol in the key. Creating class pictographs to represent data collected during daily activities (e.g., the number of different genres of books checked out from the library, the number of students buying different foods from the cafeteria) may be helpful.*

3. Emma wants to know if more students in her class ride a bus home or ride an after school van. Write a question she could ask to gather the needed data and create a graph.





*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.*

4. This picture shows the balls in the school gym.



Complete the tally chart to show the number of each type of ball.






**Balls in the School Gym**


Type of Ball	Tally
Basketball 	
Football 	
Soccer ball 	
Softball 	

*Students may not include all of the balls shown in the picture, which may indicate the students need more experience organizing data sets to develop strategies for keeping track when data are provided in a picture. Students may benefit from exposure to peers' strategies for organizing pictorial data shared and modeled during classroom discussions.*

5. The pictograph shows the number of animals on a farm. Use the graph to answer the questions.

**Animals on the Farm**

<b>Sheep</b>	
<b>Cows</b>	
<b>Pigs</b>	
<b>Chickens</b>	
<b>Horses</b>	

Key  = 2 animals

- a) What is the total number of animals on the farm? \_\_\_\_\_  
*Students who answer 11 animals are counting by ones and not attending to the key. These students would benefit from more experience creating pictographs in which the symbol represents more than one item.*
- b) Exactly how many more sheep are on the farm than horses? \_\_\_\_\_  
*Students may add the number of sheep and horses together because they see the word "more." This may indicate students are using a "key word" strategy. These students may benefit from more exposure to peers' strategies for interpreting information presented in pictographs and to a variety of comparison story structures. Refer to the Grade 2 Mathematics Instructional Guide for descriptions and examples of problem types for addition and subtraction.*
- c) The farm has the fewest of which animal? \_\_\_\_\_  
*Students may not recognize that there is more than one correct answer and only choose chicken or cow. These students would benefit from more experiences interpreting data with categories that have equal amounts.*

6. Use the bar graph to answer the questions.



a) What is the total number of daisies and tulips in the garden? \_\_\_\_\_

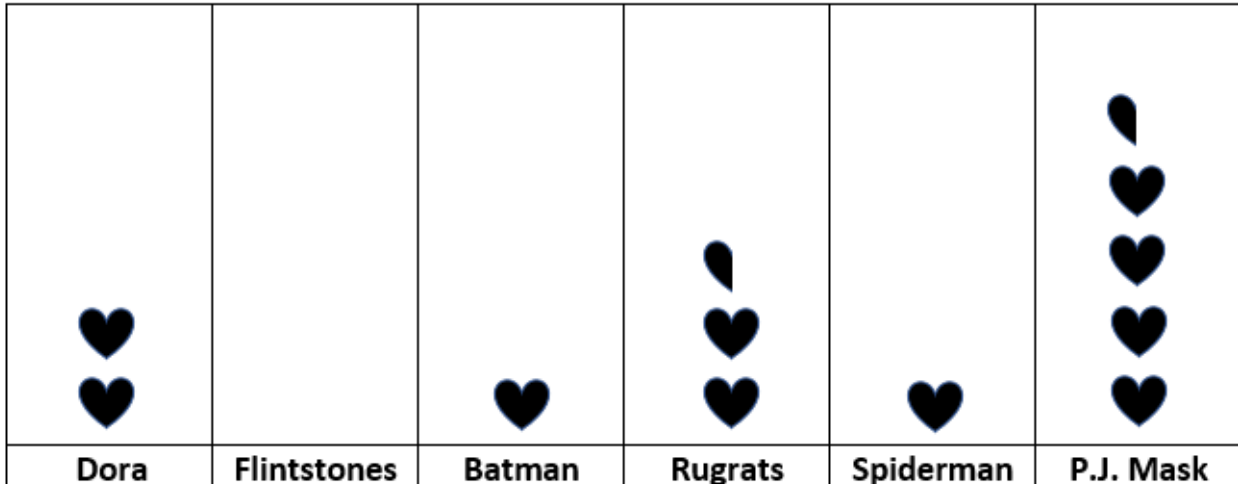
*Students may only write the value of either the daisies or the tulips, which may indicate that students are not using the complete context to answer the problem. These students would benefit from experience generating questions that can be answered by interpreting a graph. Incorporating different types of graphs and discussions that depict results of regular classroom routines (e.g., the number of students who brought lunch or bought different foods for lunch) allows time to develop the ability to analyze, interpret, and summarize data.*


b) Write a sentence comparing the number of sunflowers to another type of flower in this garden.

*Students who are unable to write a sentence comparing two categories would benefit from determining if given statements comparing data categories represented in a graph are true and from hearing discussions in which peers justify their reasoning about those statements. It may be helpful for students to state their comparison sentence out loud before writing it. Additionally, scaffolding in the form of sentence frames (e.g., The number of \_\_\_\_\_ is [# more than/ # less than] the number of \_\_\_\_\_.) may help students develop the ability to compose statements comparing data categories.*

7. Steven created a pictograph to keep track of how many minutes he was watching his favorite cartoons. Use the pictograph to answer the questions.

**Minutes Spent Watching Cartoons**



Key  = 10 minutes

- a) Which cartoons did Steven watch for the same number of minutes?

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*Students may only record one category, which may indicate students need more experiences interpreting data with categories that have equal amounts. Opportunities to discuss and describe data that are the same and different and using the graph to justify those statements will be beneficial.*

- b) The cartoon Steven watched the most was \_\_\_\_\_.  
He watched this cartoon for exactly \_\_\_\_\_ minutes.

*Students may select Dora as the cartoon watched the most because it is the tallest row with no half hearts. These students would benefit from more experience constructing and interpreting graphs in which data is represented by halving the symbol in the key.*

*Students who select P.J. Mask but answer that Steven watched the cartoon for 5 minutes may have counted the hearts by ones instead of by tens and disregarded the half heart. These students would benefit from more experience collecting data, creating pictographs, and interpreting graphs in which a partial symbol has been used to represent data.*

*Students who select P.J. Mask but answer that Steven watched the cartoon for 50 minutes may not know what to do when there is a half heart. These students may benefit from instruction in doubling and halving, as well as more experiences creating pictographs in which the symbol represents more than one item.*

- c) Predict: Which cartoon do you think Steven will watch tomorrow? Explain your thinking.

*Students who do not predict that Steven will watch P.J. Mask may not understand how data are used to make predictions or generalizations. More opportunities to hear classmates' predictions involving data that have been previously discussed, and the explanations for those predictions, will help students build this understanding.*