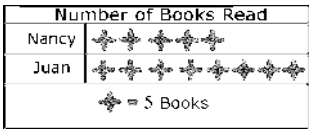
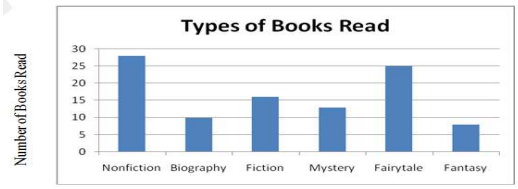
GRADE 3 - MODULE 11 - REPRESENT AND INTERPRET DATA

Big Idea
Data can be represented and interpreted in scaled bar graphs, scaled picture graphs and line plots.
Vocabulary
scale, picture graph, scaled picture graph, scale, bar graph, scaled bar graph, *x*-axis, *y*-axis, line plot
Prior Learning
In Grade 2, created picture graphs and bar graphs and solved simple problems using information from a bar graph.
Essential Questions
• Explain how to interpret data from a tally table and frequency chart? • What are the differences between a bar graph and a scaled bar graph? • What are the differences between a picture graph and a scaled picture graph? • What are the steps in constructing a scaled bar graph? • What are the steps in constructing a scaled picture graph? • How do we determine the scale to use for scaled bar graphs and scaled picture graphs? • How can we use data representations to help us solve real-world and mathematical problems?
Competencies
• Students will collect and record data in tally tables and frequency tables. • Students will solve problems by using the strategy of making a table. • Students will read and interpret data in a picture graph and a scaled picture graph. • Students will construct a picture graph and a scaled picture graph to display data. • Students will read and interpret data on a bar graph and a scaled bar graph. • Students will construct a bar graph and a scaled bar graph to display data. • Students will use data represented in bar graphs, scaled bar graphs, picture graphs, and scaled picture graphs to solve problems.
Misconceptions
Students may have difficulty transitioning from the scales used in a bar graph and a picture graph to a scaled bar graph and scaled picture graph when creating and interpreting data from the graphs.
Resources from The Key Elements to Mathematics Success - KEMS Grade 3 for Building the Conceptual Understanding of this Module
LESSON 22 - SCALED PICTURE GRAPHS Additional Activities: Quiz – T645-T647; Scaled Picture Graph– Chain Reaction T987-T990 LESSON 23 - SCALED BAR GRAPHS. Additional Activities: Quiz – T671–T674; Scaled Bar Graphs– Scavenger Hunt T991-T994

CCSS-Mathematics Content Standard	Examples
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.	Students should have opportunities reading and solving problems using scaled graphs before being asked to draw one. Work with scaled graphs builds on students' understanding of multiplication and division. Students should be graphing data that is relevant to their lives There are several steps for students as they work with data collection and analysis • Pose a question • Collect data • Analyze data • Interpret data (PCAI). Example 1: • Pose a question: Student should come up with a question. What is the typical genre read in our class? • Collect and organize data: using a student survey. (The following graphs provided below all use five as the scale interval, but students should experience different intervals to further develop their understanding of scale graphs and number facts.) Scaled picture graphs include symbols that represent multiple units. Graphs should include a title, categories, category label, key, and data.  Scaled Bar Graph: Students use both horizontal and vertical bar graphs. Bar graphs include a title, scale, scale label, categories, category label, and data.  • Analyze and Interpret data: o How many more nofiction books where read than fantasy books? o Did more people read biography and mystery books or fiction and fantasy books? o About how many books in all genres were read? o Using the data from the graphs, what type of book was read more often than a mystery but less often than a fairytale? o What interval was used for this scale? o What can we say about types of books read? What is a typical type of book read? (beyond standard) If you were to purchase a book for the class library which would be the best genre? Why? (beyond standard)

Questions for 3.MD.3

1.

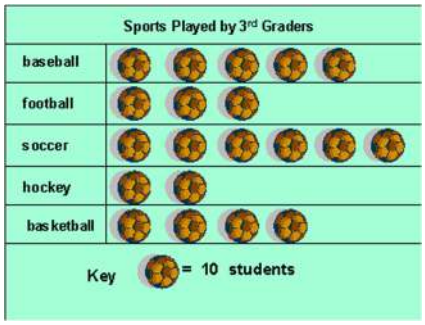
Stickers Earned This Week	
Name	Stickers
Sam	☺☺☺☺☺☺
Miranda	☺☺☺☺☺
Christopher	☺☺☺☺☺☺☺
Liz	☺☺☺☺☺☺☺☺
Kim	☺☺☺☺☺☺☺
☺ = 2 stickers	

A. Who earned the most stickers? _____

B. How many stickers did Sam and Miranda earn together? _____

C. Kim puts two new stickers on the board. How many does she have now? _____

2. Use the graph below to answer the questions.

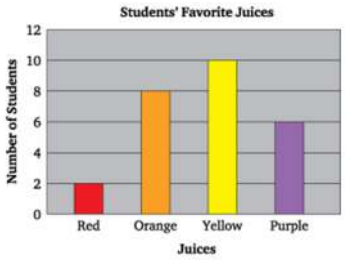


A. How many 3rd graders play soccer?

B. How many more 3rd graders play football than hockey?

C. How many 3rd graders play baseball and basketball?

3.

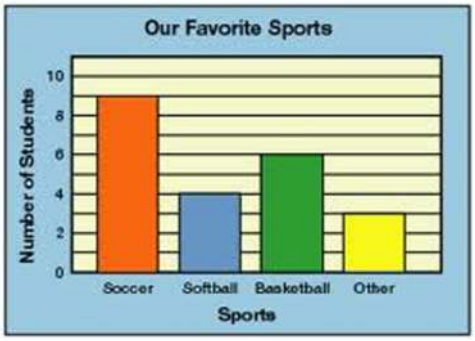


A. What is the title of this graph? _____

B. What is the most popular juice? _____

C. How many students like this juice? _____

4.



A. What is the title of this graph?

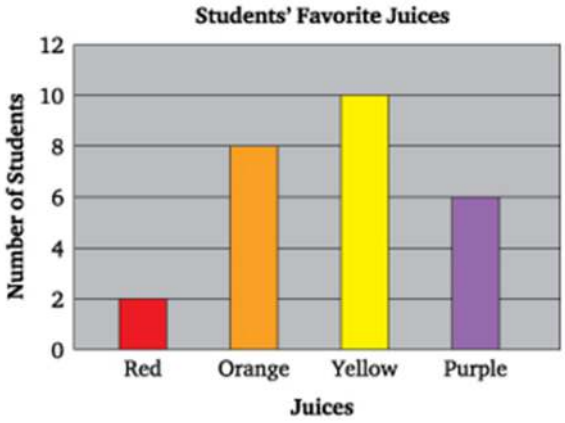
B. Which sports are listed?

C. Which is the most popular sport?

D. How many more people like basketball than softball?

E. How many people don't have soccer, softball, or basketball as their favorite sport?

5.



A. How many students were surveyed for this graph?

B. What is the difference in the number of students who chose yellow and purple juice?

Answer Key for Questions for 3.MD.3

1. A. Who earned the most stickers? Liz
B. How many stickers did Sam and Miranda earn together? 22 stickers
C. Kim puts two new stickers on the board. How many does she have now? 18 stickers

2. A. How many 3rd graders play soccer? 60 students
B. How many more 3rd graders play football than hockey? 10 more students
C. How many 3rd graders play baseball and basketball? 90 students in all

3. A. What is the title of this graph? Students' Favorite Juices
B. What is the most popular juice? Yellow
C. How many students like this juice? 10 students

4. A. What is the title of this graph? Our Favorite Sports
B. Which sports are listed? Soccer, Softball, Basketball, Other
C. Which is the most popular sport? Soccer
D. How many more people like basketball than softball? 2 more people
E. How many people don't have soccer, softball, or basketball as their favorite sport? 3 people

5. 26 students were surveyed. There were four more students who chose yellow as their favorite juice.

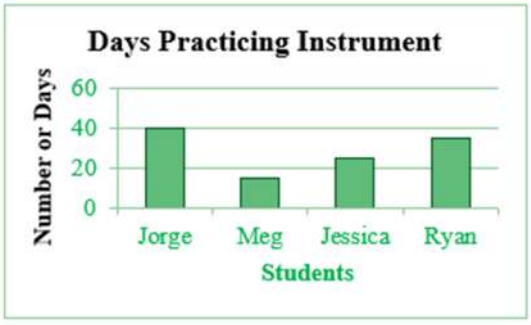
Tasks for 3.MD.3

*Teacher Note: Please read the Commentary section for the Illustrative Math Tasks. Some tasks will be instructional requiring more teacher modeling and direction. Others will provide the opportunity for students to demonstrate their knowledge of a concept.

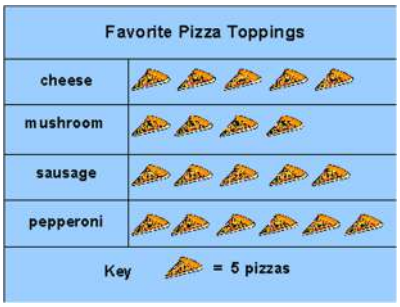
Illustrative Math Task: Classroom Supplies
https://tasks.illustrativemathematics.org/content-standards/3/MD/B/3/tasks/1315

Extra Questions for Warm-ups and Homework for 3.MD.3

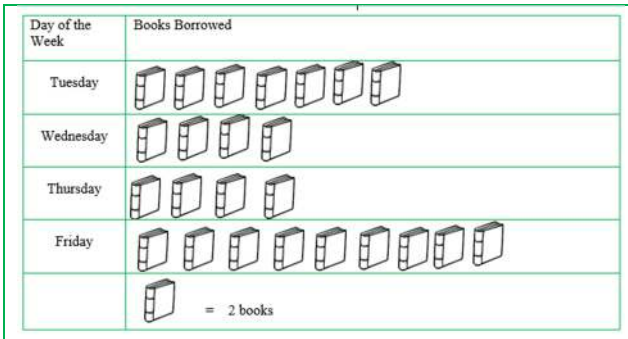
1. Jorge, Meg, Jessica and Ryan have been learning to play the trumpet for band. What is the different in the number of days that Jorge and Meg have been practicing?



2. How many students chose sausage as their favorite pizza topping?



3. If 30 books were borrowed on Saturday, how many book icons will there be in the row for Saturday? On Monday, only two books were borrowed. How many more books were borrowed on Wednesday?



Works Referenced in the Development of the Module	
Common Core State Standards Initiative www.corestandards.org	Ohio Department of Education http://education.ohio.gov/Topics/Learning-in-Ohio/Mathematics
Illustrative Mathematics Project https://illustrativemathematics.org/	North Carolina Math Tools for Teachers https://tools4ncteachers.com/
Mathematics Assessment Project https://www.map.mathshell.org/index.php	Smarter Balanced Assessment Consortium https://smarterbalanced.org/
PARCC http://parcconline.org/	Utah Education Network https://www.uen.org/core/math/
NOYCE Foundation: https://www.insidemathematics.org/	