Department of Curriculum & Instruction

First Grade Math

Unit	1-12 Data
Time Frame	5/10-5/21
Big Ideas	1. Tally marks and T-charts are useful in recording and organize data. 2. Graphs make it easier to compare data. 3. Data from a table or chart can be used to make a bar graph.
Essential Questions	1. What are some ways you can collect and show data? 2. How can data be organized effectively? 3. How can you compare the data?

TEKS / Student Expectations	Skills	Concepts
(Readiness TEKs) 1.8(C) draw conclusions and generate and answer questions using information from picture and bar-type graphs	Draw generate	Draw conclusions and generate and answer questions using information from picture and bar-type graphs
(**Supporting TEKs**) 1.8(A) collect, sort, and organize data in up to three categories using models/representations such as tally marks or T-charts 1.8(B) use data to create picture and bar-type graphs	Collect Sort Organize use	Data in up to three categories using models/representations such as tally marks or T-charts Data to create picture and bar-type graphs
(Process Skill) TEKS		Mathematics to problems arising in everyday life, society, and the workplace

TEKS / Student Expectations	Skills	Concepts
1.1(A) apply mathematics to problems arising in everyday life, society, and the workplace	Apply	Problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution
1.1(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	Use	Tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems
1.1(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems	Select	Mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
1.1(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;	Communicate	Representations to organize, record, and communicate mathematical ideas
1.1(E) create and use representations to organize, record, and communicate mathematical ideas	Create	Mathematical relationships to connect and communicate mathematical ideas
1.1(F) analyze mathematical relationships to connect and communicate mathematical ideas	Analyze	Mathematical ideas and arguments using precise mathematical language in written or oral communication.
1.1(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	Display Explain Justify	

Tier I Instructional Strategies – Classroom Instruction for All Students

- **Pearson** Envision Topic 15

Tell students that the key to this lesson is to understand that graphs and charts are useful in comparing data. Provide multiple opportunities for independent practice, and allow time for students to present their work to the class. When presenting, prompt students to elaborate.

● Establish real-world connections for why graphs are important.
○ How can this help solve any problems in your everyday life?
○ Ask a student to be your "Data Interpreter"
○ Tell them they are going to be responsible for buying ice cream for the class sundae party. The students choices are chocolate, vanilla, and strawberry
○ Next, have all of the other students in the class, simultaneously shout there choices
○ Ask your data interpreter to tell you some basic information: What was the most favorite? The least? How many students like vanilla?
○ Discuss with students that graphs are way to display information in an organized way so that it can be analyzed efficiently but also accurately.
○ Repeat this activity after conducting a survey, and creating a graph

○ Ask the same questions to your Data Interpreter and emphasize how much easier it is to interpret the data with a graph

● Misconceptions:
○ Some students may think they can compare the length of the rows/columns of pictures in a picture graph rather than comparing the number of pictures in each row/column, not realizing that the size of the pictures will affect the length of the row/column.
○ Some students may think leaving gaps between cells or using cells of differing sizes on a bar-type graph does not affect the data, not realizing that the size and spacing of the cells should be consistent.
○ Some students may think data in a vertical bar-type or picture graph can be arranged from the top to bottom, not realizing that the cells on a bar graph or pictures in a picture graph are arranged from bottom to top.
○ Some students may think data in a horizontal bar-type or picture graph can be arranged from right to left, not realizing that the cells on a bar graph or pictures in a picture graph are arranged from left to right.
○ Some students may think data can only be used in one type of graph rather than realizing the same data can be represented using either a bar-type or picture graph (e.g., if it's not something easy to draw or find a picture for the data, then the data might be best displayed using a bar-type graph rather than a picture graph, etc.).

Student survey recording document
Class Survey and Data Collection with Tally Marks-1
Class Survey and Data Collection with Tally Marks-2

Students need to make connections between graphs displaying the same data.

- Change a picture graph into a bar graph and vice versa
- "Graph in Reverse"
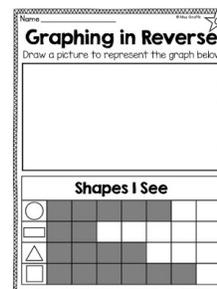
1.8(C) draw conclusions and generate and answer questions using information from picture and bar-type graphs

■ Comparative language with and without numbers

- Ex: More than, less than, fewer than, the most, the least, the same as, equal to, etc.
- Ex: 10 more than, 5 greater than, 2 less than, 1 fewer than, etc.

- Generate *and* Answer questions using data in in picture graphs and bar-type graphs
    o Description of data
        ▪ "How do most students get home?"
        ▪ "Most students get home in a car."
        ▪ "What does this graph show us?"
        ▪ "This graph shows us the three ways students get home: bus, car, walking."
    o Comparison using data values
        ▪ "How many more car riders than bus riders?"

- ▪ "There are three more car riders. Because 9-6=3"
  - o Operations using data values
    - ▪ "How many students are represented in all?"
    - ▪ "There are 17 students. Because 9+6+2=17"
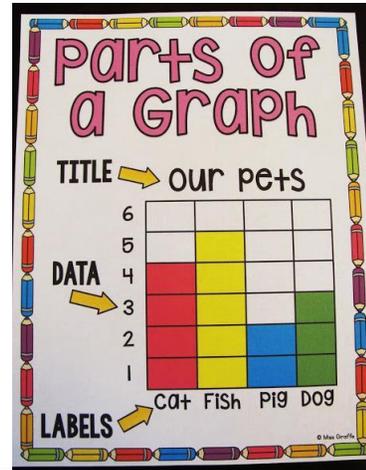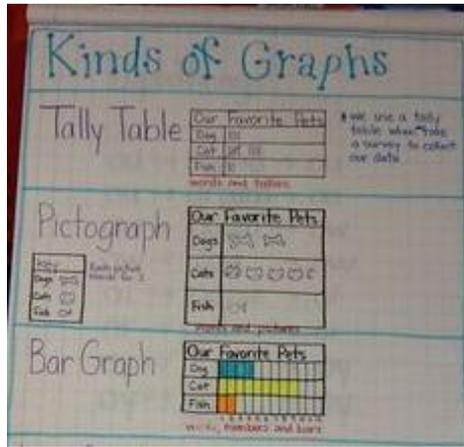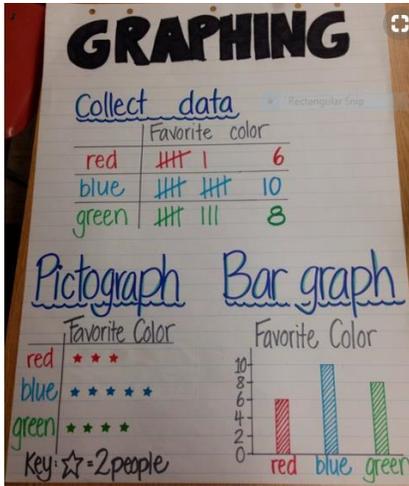
Stations/Centers

Stations provide students the opportunity to practice skills that have introduced or taught in whole group or Guided Math lessons. Partnering students in stations allows them the opportunity to talk about their mathematical thinking, apply academic vocabulary, and hear how their peers think about math. When students visit math centers, the teacher has the opportunity to meet with Guided Math groups for small group instruction. **Once stations are created and introduced, they can be spiraled back and utilized in any unit.**

Fluency-

• Teacher creates three spinners using the template provided. Two spinners will have numbers 1-10, the third spinner will have the plus and minus symbols. Students will use the spinners to generate expressions to solve.

  o [Spinner Template](#)

• Students draw two number cards ranging from 1-10. Using white boards or journals the students will record the "Fact Family" . o This activity can be recreated with dice or playing cards
  o Differentiation

  • Draw three or more numbers

- Generate a word problem, use the writing process to edit, revise, and publish an entry for a class book (with the correct equation on the back a s a self-check). Create the class book using a plastic folder with sheet protectors to easily add new entries. Keep this book in the math station rotation for the remainder of the year. Other students will enjoy reading and solving their classmate's word problems.
- Roll or draw 4 numbers to create two simple expressions. Students will determine if the expressions are equal or unequal.

• Students work in partners. Each partner creates a 10 question "Math Test" with an answer key. The partners switch test and solve; using the answer key to self check.

Hands On

• Sort and graph manipulatives (pattern blocks, coins, sums on dominoes

o [Pattern Block Graph](#)

o [Coin Graphing](#)
• Create fun "Roll and Graph" stations by taping picture to tissue boxes. Keep the engagement high by putting pictures of the students

o Create a Bar Graph for students to record their data by making a table in Microsoft Word. Laminate or place graph templates in sheet protectors for repeated use.
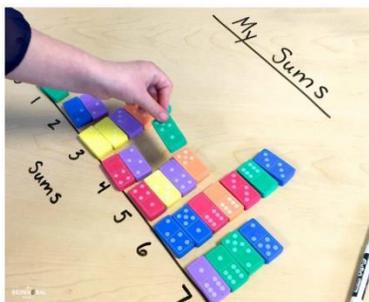
- [Name Graph](#)
- [Coin Flip Graph](#)

Strategies for Struggling Students (S³)

For struggling students, use smaller groups to focus on comprehension, analysis, and /or application of content.

Use pre-made graphs to help build understanding of parts of a graph.

-Provide scaffolding for creating a graph.

-In small group, have students sort linking cubes by color. Create a bar graph showing the amounts of each color.

One of the hardest graphing questions that kids struggle with are the "How many More?".
○ Students often do not understand exactly WHAT it's asking. "How many more" often sounds to them like they need to just add the 2 numbers together.

In small groups, let 2 kids be your examples. Give one kid (Ava) 8 red cubes and another kid (Jack) 5 blue cubes. Say how many does Ava have? 8. How many does Jack have? 5. Okay so now we want to figure out how many MORE Ava has than Jack. Have Ava and Jack link their cubes together in sets of 2 (1 red and 1 blue from each) until Jack runs out of cubes. Then say, "See? Ava still has some left over. So HOW MANY MORE cubes does Ava have than Jack? Count how many cubes Ava has leftover to show them the concept.

○ After they begin to understand the concept, help them remember which operation to use with the following mnemonic device

- ▪ "in *A*ll" usually means to "*A*dd"
- ▪ 'how many *M*ore" usually means to '*M*inus" (subtract) Review representing numbers with Tally Marks
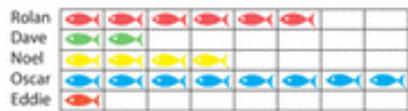
Vocabulary

Category	Sort
Collect	Horizontal
Compare	Vertical
Organize	Title
Survey	Data
Bar Graph	Picture
Picture Graph	Graph

Sample STAAR or STAAR-Like Assessment Items

The following sample questions are one of many ways to assess the TEKS student expectation.
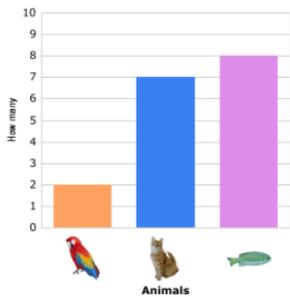
Generate a question about the graph above.

   What can you determine from this graph?

Pet animals collection	
🐖	|||
🐕	|||||
🐢	||||

Use the tally mark chart to create a bar graph.

Conduct a survey by asking your peers what kind of ice cream they like: chocolate, strawberry, vanilla. Use the data to create a bar graph. Complete the sentences: _____ has _____ fewer than _____. There are _____ more _____ than _____.

Assessment Link

Resources

The suggested resources are one of many ways to address the TEKS student expectation.

TEA Stations and Small Group Activities

1. Grade 1
2. Kindergarten

TEA vertical alignment chart

Literature

The Great Graph Contest. Loreen Leedy
Tally O'Malley. Stuart Murphy
Family Reunion. Bonnie Bader
The Best Vacation Ever. Stuart Murphy
Lemonade for Sale. Stuart Murphy