Math is _____
Introduction to Data Sets

TEACHER OBJECTIVE: Get a sense for class attitude toward math and introduce data sets/distribution.

STUDENT OBJECTIVE: Express how you feel about math.

Materials: Strips of paper with Math is _____ typed on them.
Word bank on board or overhead that includes the following words: Fun, Boring, Challenging, Easy, Confusing.

1. Distribute the strips of paper.
2. Tell students to write a word from the word bank (or any other word of their choice) that best describes how they feel about math.
3. Tell students that writing names on the strip of paper is optional.
4. Collect the strips of paper after the students have completed them.
5. Ask for six volunteers to stand at the front of the board to record the answers.
6. Five volunteers are assigned a word from the bank (Fun, Boring, Challenging, Easy, Confusing) and the sixth is assigned the category "Other".
7. Each volunteer writes their word/category on the bottom of the chalkboard, making sure that each word lines up with each other in a row.
8. Read out each answer and have the volunteers put an X above their word/category each time they hear their word/category called. The X's should be placed vertically above each other in order to form the look of a bar chart.
9. If you get an answer that is not from the word bank, don't say the actual word. Instead just say "Other" and put these answers off to the side.
10. After all of the answers have been read, go back to the "Other" words and read them out one-by-one in order to lead a class discussion on whether they are truly distinct answers or if they should be counted as one of the predetermined words from the bank.
11. After the distribution is finalized, lead a discussion on what the data says about the class attitude toward math. Get children to discuss what makes math "Fun, Boring, Challenging, Easy, Confusing" or whatever "other" answers are provided.

Measuring Our Surroundings
Metric Measurement and Estimation

TEACHER OBJECTIVE: Get students to internalize the concept of estimation through measurement.

STUDENT OBJECTIVE: Measure items in and around the classroom.

Materials: Cuisenaire Rods (10's and 1's), Lab sheets for recording estimates and measurements a sheet of paper with METER written on it.

1. Explain exercise to students (they will be estimating and measuring items in and around the classroom).
2. Create groups of three children and give each group Cuisenaire Rods (one ten and ten ones).
3. Establish ground rules for leaving the classroom and give instructions on how to rotate through the measurement items in order to keep things organized. (Be sure to check school rules on students leaving the classroom before sending them outside.)
4. Assign each group to an item and have them start. Groups rotate through items clockwise, agreeing on an estimate for each one and then recording the actual measurements.
5. After 15 minutes, students reconvene in the classroom sitting together by group.
6. Lead a class discussion on how the students felt they did on the estimation process:
    - Which item was easiest to estimate and why?
    - Which item was hardest to estimate and why?
    - What strategies did students use in order to make their estimates?
7. After the discussion (with students still seated), ask for volunteers to identify an item in the room that is a meter -- have the volunteers measure them to determine if they are correct.
8. After identifying an item that represents a meter, have the students label it so that they have visual references for the rest of the year.
9. Collect the lab sheets to use for tomorrow's lesson.

Graphing Insights
Introduction to Graphing

TEACHER OBJECTIVE: Get students to think about different types of graphs and how they represent the data visually.

STUDENT OBJECTIVE: Create graphs from yesterday's data.

Materials: Lab sheets from yesterday, laptop with projector or SMART Board with Excel program.

1. Explain exercise to students (will be graphing info from yesterday's lesson).
2. Have children sit in yesterday's groups again.
3. Give lab sheets from yesterday to each group.
4. Ask for a volunteer to come up to the laptop/SMART Board to create a graph.
5. Take informal vote (raise of hands) on which item was hardest to measure.
6. Have volunteer record in Excel each group's estimate for this item (each group gives estimate one-by-one) – volunteer also includes the actual item measurement in Excel data.
7. Volunteer sorts the answers in descending order in Excel.
8. Volunteer creates a bar chart in Excel (teacher gives direction on how to do this).
9. Ask for new volunteer, who comes up to laptop/SMART Board to create a line graph with the info in Excel (teacher gives direction on how to do this).
10. Ask for new volunteer, who comes up to laptop/SMART Board to create a pie chart with the info in Excel (teacher gives direction on how to do this).
11. Lead a class discussion to decide which graph/chart represents the data best visually (should be bar chart).
12. Teacher creates these three types of charts (bar, line and pie) in Excel using the "Math is _____" data from Day 1.
13. Lead a class discussion to decide which chart represents this "Math is _____" data best visually (should be pie chart) and why it differs from the chart that showed the estimation data best visually.
14. Teacher explains proportionality concept behind pie charts.
15. Save Excel file and lab sheets for tomorrow's lesson.

Data Speaks
Introduction to Data Analysis

TEACHER OBJECTIVE: Get students to think about what the distribution set of a data set tells us.

STUDENT OBJECTIVE: Analyze data and charts.

Materials: Lab sheets from Day 5 and laptop with projector or SMART Board with excel program.

1. Explain exercise to students (we will be analyzing data/charts from the previous two days).
2. Have children sit in their Day 5/6 groups again.
3. Take informal vote (raise of hands) on which item was easiest to measure.
4. Ask for a volunteer to come up to the laptop/SMART Board to create a graph.
6. Have volunteer record in excel each groups estimate for the item (each group calls out their estimate one-by-one) – volunteer records the actual item measurement as well.
7. Volunteer sorts the answers in descending order in excel.
8. Volunteer creates a bar chart in excel (or whichever chart from yesterday was deemed most effective).
9. Put the bar chart from yesterday (hardest item to estimate) and the bar chart from today (easiest item to estimate) side-by-side up on projector/SMART Board.
10. Lead a class discussion on what the data/chart shows us:
    - Does it confirm the ease/difficulty of estimating each item relative to each other?
    - Introduce the concept of proportionality (how far off were the guesses relative to the actual size of the item?)
    - Introduce concept of mean by drawing a rough line through the average of the estimates.
11. Close lesson by using a real-life example (e.g., an advertising campaign or TV show ratings) to tie together the concepts of estimation, measurement, graphing and data analysis from the past three days.