Guiding theme(s): Discuss the different types of data charts/tables that students would see. How are these tables/charts different? Students will review different ways data are visualized and when it would be appropriate to use them.

- Part 1: Mix and Match activity to kick-start a discussion about choosing the appropriate data table
  - Hang up data charts around the room (half in one section of the room, half in another)
  - Break class into two teams and direct each team to one half of the room near one set of data charts.
  - Mix & Match game rules:
    - Students will compete to see which team can label the data charts correctly at first. Once the group has labeled all charts/tables/etc they can shout “COMPLETE” – and we will see who has more correct.
    - Once all labels have been properly assigned, ask each time to attach the correct definition to each pair of matched items. Talk through any challenges the teams have with assigning the definitions.
    - Discuss when it is appropriate to use each graph/chart/etc. The list in this pack includes: Pie Chart, Bar Graph, Box Plot, Scatter Plot, Bell Curve, Line and Histogram.

Guiding theme(s): Data can be presented in a variety of manners, however certain graphics provide better representation than others. While some data are easy to visualize (that is, it’s pretty clear it should be represented with a bar graph, pie chart, etc.), for some sets of data it can be more challenging than expected to select the best representation tool. By working through these questions of representations as a group, teachers will develop their own guiding questions they can use with their own students.

Part 2: Mix and Match Continued: Next, students will be provided with data sets and asked to choose the best type of data visualization and then to defend that decision.

- Distribute Data Visualization Key worksheet
What kind of pet do you own?

- Rabbit: 4
- Dog: 8
- Cat: 11
- Goldfish: 6
- Hamster: 5

number of people
Revenue by Month

Monthly Revenue

- January (Jan): $400K
- February (Feb): $800K
- March (Mar): $700K
- April (Apr): $600K
- May: $1M
- June (Jun): $600K
Revenue by Month

Classroom Performance

LOW
PERFORMERS

AVERAGE
PERFORMERS

HIGH
PERFORMERS
Classroom Performance

Source: http://www.updconsulting.com/for-whom-the-bell-curves/
Defining the cognitive classes

The Distribution of IQ

IQ Score

- Very Dull
- Dull
- Normal
- Bright
- Very Bright

50 60 70 80 90 100 110 120 130 140 150
Evaluation of Brands A, B and C
Evaluation of Brands A, B and C

Figure 1. Distribution of salaries of the Acme Corporation

- Number of employees
- Salary ($ thousands)

- 0-10
- 11-21
- 22-32
- 33-43
- 44-54
- 55-65
- 66-76
- 77-87
- 88+

The graph shows the distribution of salaries at the Acme Corporation, with the highest concentration in the 44-54 salary range.
Red River Discharge Rate - Fargo Station

Discharge (cu ft/sec) vs. Month (1993)

- January: 2000
- February: 5000
- March: 10000
- April: 25000
- May: 20000
- June: 15000
- July: 30000
- August: 27000
- September: 20000
- October: 15000
- November: 10000
- December: 5000
Approximate composition of the air

- Nitrogen: 79%
- Oxygen: 20%
- Other gases: 1%

NB "Other gases" includes carbon dioxide (0.03%) and small proportions of other gases include argon and water vapour.
Percentage of estimated World population by continent

- Africa: 14%
Wife’s Age as a Function of Husband’s Age
Wife’s Age as a Function of Husband’s Age

Source: http://onlinestatbook.com/chapter4/intro.html
Grip Strength and Arm Strength

[Scatter plot showing the relationship between grip strength and arm strength.]
Grip Strength and Arm Strength

Source: http://onlinestatbook.com/chapter4/intro.html
<table>
<thead>
<tr>
<th>Definition</th>
<th>When to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerical values of variables are represented by differing heights and lengths of lines</td>
<td>To visually compare quantities in different categories or groups, comparing changes over time</td>
</tr>
</tbody>
</table>
Bar Graph
<table>
<thead>
<tr>
<th>Definition</th>
<th>When to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td>A diagram used to depict the normal distribution of data</td>
<td>When probability suggests that values are equally likely to plot above or below the mean</td>
</tr>
</tbody>
</table>
Bell Curve
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<th>Definition</th>
<th>When to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle in shape with lines extending from the top and bottom to represent the spread of data</td>
<td>A standardized way of displaying the distribution of data into ranges and to identify outliers</td>
</tr>
</tbody>
</table>
Box Plot
<table>
<thead>
<tr>
<th>Definition</th>
<th>When to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphs of data distribution showing centering, dispersion and shape.</td>
<td>Can provide a spreadsheet display of large amounts of data whose patterns and trends cannot be seen in tabular form</td>
</tr>
</tbody>
</table>
Histogram
<table>
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<tr>
<th>Definition</th>
<th>When to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td>A figure comparing 2 variables, each plotted along an axis that can allow the viewer to predict future results.</td>
<td>For data that changes continuously over time whose trends can be clearly seen and values specified</td>
</tr>
</tbody>
</table>
Line Graph
<table>
<thead>
<tr>
<th>Definition</th>
<th>When to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used to compare parts as a proportion of the whole</td>
<td>When there is limited data variables and categories and when each numerical value is different</td>
</tr>
</tbody>
</table>
PIE CHART
<table>
<thead>
<tr>
<th>Definition</th>
<th>When to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical diagram using a collection of points to represent 2 or 3 different variables</td>
<td>To identify the type of relationship between multiple quantitative variables</td>
</tr>
</tbody>
</table>
Scatter Plot