**Infographics in the Classroom: Using Data Visualization to Engage in Scientific Practices**

**Activity 1: Data Graphic Interpretation**

1. Use David MacCandless’s Peak Breakup Times blank infographic (Figure 1) to have a fun introduction to infographics. Share this using the “Activity 1 Presentation” power point slides (download the slides at [www.calacademy.org/infographics-in-the-classroom-teacher-toolkit](http://www.calacademy.org/infographics-in-the-classroom-teacher-toolkit). PDF versions of the slides are also included in this packet). After students try to guess what the blank graphic is showing, reveal what it is and some of the “explanations” MacCandless offers. We modeled this after his TED talk: [http://www.ted.com/talks/david_mccandless_the_beauty_of_data_visualization?language=en](http://www.ted.com/talks/david_mccandless_the_beauty_of_data_visualization?language=en).

2. Briefly discuss with students why they think scientists would visualize their data.

3. Hand out a few graphics to analyze (Figures 2-8) and [Worksheet 1](#). Give them 10 minutes to answer the questions on their own.

4. Have students find people who did the same graphic (if you have a large class, you may want to break them into smaller groups) and share out within their group what they think the graphic is about. You can also have them complete the worksheet together.

5. Working as a group, make a poster to share what you noticed in the graphic: 1-2 sentences describing the central ideas; what numbers/data are represented and how are they represented; what do you like/dislike about the way the author presents his/her story?

6. Give the students a chance to share out their ideas as a group.

7. Make new groups of 3-5 people who did different graphics. Share what the main story was and how the author visualized the numbers. The goal of this discussion is to come up with a list of all the different ways you can visualize/represent numbers. Have them write each one on a post-it. When they are done have each group bring up the post-its and start sorting them by similar ideas.

8. Wrap up this section by summarizing the different post-it ideas. Pass out the Academy's list of ways to visualize data. Have a quick read over them - what is similar/different between them.

**Infographics used for this lesson:**

- New York Times, One race, every medalist ever, [http://www.nytimes.com/interactive/2012/08/05/sports/olympics/the-100-meter-dash-one-race-every-medalist-ever.html?_r=0](http://www.nytimes.com/interactive/2012/08/05/sports/olympics/the-100-meter-dash-one-race-every-medalist-ever.html?_r=0)
• Ocean Conservancy, International Costal Cleanup 25 years of Debris Collected, [http://media-cache-ec4.pinimg.com/550x/7d/35/82/7d358209a4be18d0db69af13ef75ce78.jpg](http://media-cache-ec4.pinimg.com/550x/7d/35/82/7d358209a4be18d0db69af13ef75ce78.jpg)
1. What ideas or pieces of information does the author present? List as many as you can.

2. Identify main conclusion told in the graphic. This should not just be the title, but what conclusion you can make from the information provided.

3. Pick one point on the image that represents a number. What is that number (you can approximate, if necessary) and what are the units? If known, what is the source of the data?

4. Describe how the author represents data in the graphic? (Ex. Using color to differentiate two things.)

5. What other ways does the author tell the audience about the key message(s)?

6. What questions do you have about the graphic? What confuses you?

7. What do you like/dislike about the graphic?
20th Century Death
What's killed the most?

- famine: 111m
- food: 76m
  - obesity: 11m
  - diabetes: 30m
  - heart disease: 35m
- ideology: 16m
  - 8.5m
  - 7.1m
  - 0.1m
- revolution: 9.5m
  - 5m
  - 2m
  - 1.6m
  - 1m
- war: 124m
  - 9.7m
- nature: 71m
- tobacco: 71m
- suicide: 70m
- murder: 26m

- smallpox: 200m
- measles: 200m
- meningitis: 190m
- tuberculosis: 130m
- whooping cough: 90m
- influenza: 50m
- HIV: 35m
- animals: 90,000
- 9,500
- 29,000
- 5,000
- 4,000
- 100
- technology: 0.2m

source: Internet and wikipedia. Data very coarse. Some guesswork and extrapolation.
Usain Bolt vs. 116 years of Olympic sprinters

Based on the athletes’ average speeds, if every Olympic medalist raced each other, Usain Bolt (the London version) would win, with a wide distribution of Olympians behind him. Below, where each sprinter would be when Bolt finishes his race.

MEDALS BY COUNTRY

<table>
<thead>
<tr>
<th>Country</th>
<th>Gold</th>
<th>Silver</th>
<th>Bronze</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>40</td>
<td></td>
<td></td>
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<tr>
<td>Britain</td>
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<tr>
<td>Canada</td>
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<tr>
<td>Trinidad and Tobago</td>
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<td>Australia</td>
<td>3</td>
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<td>Cuba</td>
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<tr>
<td>Namibia</td>
<td>2</td>
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<tr>
<td>Soviet Union</td>
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<tr>
<td>South Africa</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>United Team of Germany</td>
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</tr>
</tbody>
</table>

This chart includes medals for the United States and Australia in the “Intermediary” Games of 1906, which the I.O.C. does not formally recognize.
Farty Animals
Annual methane emissions in equivalent CO2

source: UN Environmental Programme, theregister.co.uk
TOTAL RUNS SCORED IN MAJOR LEAGUE BASEBALL
1871-2011

The total number of runs scored since 1871 is 1,814,039.
If you multiply these runs by the 360 ft covered when scoring a run, the total distance is 253,684.48 miles; 51.8% of the way to the moon.
It’s also 4.97 times the circumference of the Earth’s equator.

AVERAGE NUMBER OF RUNS SCORED PER TEAM

- Home runs per game
- Total runs per game

1871
- 1876 National League founded
- 1877 American League founded
- 1878 First games are played on artificial turf
- 1879 First games are played on artificial turf
- 1880 American League founded
- 1881 Rogers’ mound height set at 15”
- 1882 New cork-centered balls
- 1883 Spitzballs outlawed
- 1884 Babe Ruth hits 69 home runs
- 1885 The second highest ERA in history: 4.81
- 1886-87 Baseball carries on through WWII without many stars
- 1947 In April, Jackie Robinson becomes the first black player in the N.L. 
- 1954 Larry Doby becomes the first black player in the A.L. three months later
- 1961 Roger Maris and Mickey Mantle chase the single-season HR record
- 1966 The Year of the Pitcher
- 1973 Designated hitter introduced in A.L.
- 1987 The Bash Brothers (Mark McGwire and Jose Canseco) hit a combined 80 home runs for the A’s
- 1988 McGwire and Sosa’s home run chase
- 1998 The Second Year of the Pitcher

SOURCES
http://solar-system.nlsa.gov/planets/profile.cfm?Display=Facts&Object=Moon
http://www.baseball-almanac.com/rulechng.shtml

DESIGN & RESEARCH
Craig Robinson www.craigrobinson.com

Smithsonian.com
How do Scientists Communicate?

Take 3 minutes to come up with a list of as many different ways that a scientist might use to share their findings with other scientists and with the public.
Scientists often use visual representations of their data to tell stories about their research. Let’s look at one example taken from social scientists, who study how groups of people behave...
Peak Break-Up Times
According to Facebook status updates
Peak Break-Up Times
According to Facebook status updates

Source: searches for “we broke up because” from Facebook Lexicon