Activity Overview
Participants read a data set, and use provided strategies to find the most striking facts in the data. Then they practice expressing those facts in different ways to see which seems most newsworthy.

When to Use It
When a group needs practice reading data, finding a notable or newsworthy fact in the data, and putting that fact into words.

Suggested companion activities:
- Use after the group is comfortable reading data tables. If not, see Making Sense of the Data
- Follow with Communicating with Numbers.

Steps
1. **Launch the activity:** Reporters will often include one or two facts or statistics in their stories. They look for certain kinds of numbers: biggest, smallest, most typical, unusual, alarming. Our job is to give them the kinds of numbers they can use, without distorting or exaggerating. This will give us some practice doing that. (Hand out the Data Set and Strategies for Reading... If the group needs coaching, work out an example or two together.)
2. **In pairs or small groups:** Follow the strategies to find striking facts in the data. Try saying those facts in different ways, and choose the one that makes the strongest statement. (Optional: Assign each group a different kind of striking fact to find.)
3. **Debrief:**
   - How did this go? Was it hard or easy?
   - Were there ways of saying the data that were always your favorite (like percents, or __ in 10)? Or did it change for different numbers?

For the Facilitator
Pesticides on Food is the simplest data set. It’s best suited for a group who won’t need to read their own complex data, but who want to develop key skills. The other data sets have more challenging aspects: unfamiliar units, raw data, many options, etc.

If you want to use your own data, choose which Strategies for Reading... handout is the best fit. Format your data sets so they’re easy to hand out. If there are many pages, divide up the work among small groups.

Worth Noting
People get easily confused between “percent of” and “percent more/less than.” A drawing can help, like the ones shown here on the right.

Smart Moves
- Play with different ways to say it
- Use friendly numbers

Skill: Build fluency using different words to express relationships between numbers.
Time: 15-25 minutes

Preparation
Choose which data set you’ll cover:
- Environmental Test Results
- Public Health Data
- Solid Waste
- Pesticides on Food

Read the Strategies for Reading, and Facilitator Resource for that data set

Practice writing a few statements yourself

Materials
- Facilitator Resource (1 per facilitator)
- Data Set and Strategies for Reading... (1 per participant)
- Pens or pencils and scrap paper (1 per participant)
- Calculators (a few for the group to share)
Strategies for Reading Environmental Test Results

1. Find something striking

For any environmental test results, look for:
- the highest result compared to its standard
- a low result for a contaminant that is still very high compared to the standard
- a contaminant not detected, but where the detection limit was higher than the standard
- a contaminant that needs a big reduction in levels to be brought down to the standard

Changes through time - For tests at one location on different dates, also look for:
- an alarming increase or unrealistic decrease in results from month to month.
- really varied results (i.e., high, to low, then back to high again)
- results not going down quickly enough in a cleanup

Changes across location - For data for one contaminant in different places, also look for:
- much higher results in one place than another
- very high results in a location where vulnerable people might be exposed (a school, home, garden, senior center, etc.)

2. Try saying it different ways

All of the newsworthy items above involve comparing one number to another. When comparing two measured numbers “A” and “B”, you can say things like:
- A is ___ more than B / less than B [in units like µg/L or mg/kg]
- A is ___ times B
- A is ___ % of B
- A is ___ % lower than B / higher than B
- To get from A to B would require a ___% reduction / increase
- A is bigger / smaller than B by ___ order(s) of magnitude
- A is [double, triple, a quarter of, half of, a fifth of, two-thirds of] B
- [Draw a graph or infographic comparing A to B]

3. Choose the one you think makes the most newsworthy statement
Environmental Test Results

| Monitoring Well 16' BGS | Groundwater Objectives | Quality PALs | Units | Baseline 1/2/2008 |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|------------------------|--------------|-------|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                         |                        |              |       | Result Limit      |  | Result Limit | Result Limit | Result Limit | Result Limit | Result Limit | Result Limit | Result Limit | Result Limit | Result Limit | Result Limit | Result Limit |
|                         |                        |              |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Vinyl Chloride          | 2                      | 1            | ug/L  | 530               |  | 25 | 100          | 1.0           | 100          | 5.0           | 16            | 10            |  |  |  |  |
| 1,1-Dichloroethene      | 7                      | 3.5          | ug/L  | <                 |  | 25 | 1.1          | 1.0           | <            | 5.0           | <             | 10            |  |  |  |  |
| trans-1,2-Dichloroethene| 100                    | 50           | ug/L  | 70                |  | 25 | 20           | 1.0           | <            | 5.0           | 19            | 10            |  |  |  |  |
| cis-1,2-Dichloroethene  | 70                     | 35           | ug/L  | 6,800             |  | 25 | 2,100        | 1.0           | 160          | 5.0           | 2,300         | 100           |  |  |  |  |
| Trichloroethene         | 5                      | 2.5          | ug/L  | 1,200             |  | 25 | 2,500        | 1.0           | 82           | 5.0           | 2,300         | 100           |  |  |  |  |
| Tetrachloroethene       | 5                      | 2.5          | ug/L  | 1,800             |  | 25 | 4,100        | 1.0           | 330          | 5.0           | 2,900         | 100           |  |  |  |  |

This is one page of groundwater test results from a site near a closed textile mill. The company knows the site is contaminated and is trying to clean it up. These data are from one groundwater monitoring well, tested for six contaminants, on four different dates.

In this table, the “Groundwater Objectives” are the state standards for groundwater. “Quality PALs” are the Preventive Action Limits, limits set at half of the state standards.

The “Limit” shown for each testing date is the detection limit used in that particular test.

“<” means the contaminant was not detected in that particular test.
Environmental Test Results

Sample Newsworthy Facts

Tetrachloroethene has been as high as 820 times its groundwater objective.

The lowest reading for trichloroethene, in July, was still 16 times the objective.

Even though the July numbers were much lower, the October trichloroethene levels were still 92% of the April levels – or – Even though the July numbers were much lower, the October trichloroethene levels were only 8% lower than the April levels.

No 1,1-Dichloroethene was detected in January, but the detection limit was more than 7 times the PAL... so the levels could have been 7 times the PAL, but we wouldn’t know, because the equipment used couldn’t detect it.

The detection limits for trans-1,2-Dichloroethene were set poorly in January. They were only 50% of the PAL. In April, the detection limits were set more conservatively, at 2% of the PAL.

The levels of tetrachloroethene in October were over 60% higher than they had been in January.

In January, the levels of trans-1,2-Dichloroethene were 20 µg/L above the Quality PALs, but were still 30 µg/L below the Groundwater Objectives.

Even if the trichloroethene returned to its July levels, we would still need to see a 94% reduction in order to meet the groundwater objectives.

The levels have since come down, but the first time they tested for cis-1,2-Dichloroethene, levels were over the groundwater objectives by two orders of magnitude.

<table>
<thead>
<tr>
<th>Monitoring Well 16' BGS</th>
<th>Groundwater Objectives</th>
<th>Quality PALs</th>
<th>Units</th>
<th>Baseline 1/2/2008 Result Limit</th>
<th>Baseline 04/01/2008 Result Limit</th>
<th>Baseline 07/07/2008 Result Limit</th>
<th>Baseline 10/01/2008 Result Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinyl Chloride</td>
<td>2</td>
<td>1</td>
<td>ug/L</td>
<td>530 (25) 100 (1.0) 100 (5.0)</td>
<td>16 (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,1-Dichloroethene</td>
<td>7</td>
<td>3.5</td>
<td>ug/L</td>
<td>&lt; (25) 1.1 (1.0) &lt; (5.0) &lt; (10)</td>
<td>&lt; (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>trans-1,2-Dichloroethene</td>
<td>100</td>
<td>50</td>
<td>ug/L</td>
<td>70 (25) 20 (1.0) &lt; (5.0) 19 (10)</td>
<td>&lt; (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cis-1,2-Dichloroethene</td>
<td>70</td>
<td>35</td>
<td>ug/L</td>
<td>6,800 (25) 2,100 (1.0) 160 (5.0)</td>
<td>2,300 (100)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trichloroethene</td>
<td>5</td>
<td>2.5</td>
<td>ug/L</td>
<td>1,200 (25) 2,500 (1.0) 82 (5.0)</td>
<td>2,300 (100)</td>
<td></td>
<td></td>
</tr>
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<td>Tetrachloroethene</td>
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<td></td>
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Strategies for Reading Public Health Data

1. Find something striking

For any public health data, look for:
- the highest rates (incidence or prevalence) compared to the average (state or national)
- a disease needing a significant reduction in rates to be brought down to the average
- a disease whose rates are striking compared to those of another disease’s rates

Changes through time - For data from one location over time, also look for:
- an alarming increase, or suspicious decrease in rates
- really varied rates (i.e., high, to low, then back to high again)
- rates not going down quickly enough following an alleged resolution of a problem

Changes across location - For data for one disease across many locations, also look for:
- much higher results in one place than another
- very high results in a location where vulnerable people might be exposed (a school, home, garden, senior center, etc.)

2. Try saying it different ways

All of the newsworthy items above involve comparing one number to another. When comparing two rates “A” and “B”, you can say things like:
- A is ___ more than B / less than B [using units like “___ new cases per 100,000 people”]
- A is ___%, the same as ___ out of 100, ___ in 10, one in __, or ___ in ___
- A is ___ times B
- A is ___% of B
- A is ___% lower than B / higher than B.
- To get from A to B would require a ___% reduction / increase
- A is bigger / smaller than B by ___ order(s) of magnitude
- A is [double, triple, a quarter of, half of, a fifth of, two-thirds of] B
- [Draw a graph or infographic comparing A to B]

3. Choose the one you think makes most newsworthy statement
Public Health Data

Thyroid Cancer Incidence in the United States, 1999-2009

- Women
- Men

New Thyroid Cancer Cases per 100,000 people

- 1999: 9.9, 3.7
- 2000: 11, 3.9
- 2001: 11.4, 4
- 2002: 12.2, 4.3
- 2003: 12.9, 4.4
- 2004: 14, 4.7
- 2005: 15.1, 5.2
- 2006: 16.1, 5.4
- 2007: 17.3, 5.9
- 2008: 18.7, 6.3
- 2009: 19.3, 6.6
Public Health Data

Sample Newsworthy Facts

Women's thyroid cancer rates in the U.S. have almost doubled in ten years.

In 1999, one in every 10,000 women in the U.S. was diagnosed with thyroid cancer. By 2009, it was one in every 5,000.

Every year from 1999 to 2009, the incidence of thyroid cancer in women increased, by anywhere from 3.6% to 10% per year.

In 2009, men’s thyroid cancer rates were just 34% of women's.

In 2009, men’s thyroid cancer rates were 66% lower than women's.

In 1999, women's thyroid cancer rates were 167% higher than men's. By 2009, they were 192% higher than men's.
Strategies for Reading Solid Waste Data

1. Find something striking

For any solid waste data, look for:
- the grand totals, the maximums
- a minimum that might still be considered very high
- an alarming increase or unrealistic decrease
- fluctuating or unusual numbers (i.e., high, to low, then back to high again)
- how the waste will move around: number of trucks involved, associated exhaust and road damage, etc.

2. Try saying it different ways

Most of the newsworthy items above involve comparing one number to another. When comparing two numbers “A” and “B”, you can say things like:
- A is ___ more than B / less than B [in units like tons or truck trips]
- A compared to B is the same as ___ to 100, ___ to 10, one to __, or __ to __
- A is ___ times B
- A is ___ % of B
- A is ___ % lower than B / higher than B
- To get from A to B would require a ___% reduction / increase
- A is bigger / smaller than B by ___ order(s) of magnitude
- A is [double, triple, a quarter of, half of, a fifth of, two-thirds of] B
- [Draw a graph or infographic comparing A to B]

3. Choose the one you think makes the most newsworthy statement
Solid Waste

The data below are from a company that accepts municipal solid waste (MSW). One one site, there is a landfill, and a processing facility that sorts the waste. The company is proposing a big expansion. The community is concerned about the size of the landfill, and about the number of garbage trucks going in and out of the site.

Note that some MSW goes straight into the landfill. Some goes to the processing facility first, and then into the landfill. Some goes to the processing facility, and is then trucked offsite again. The top table shows the tonnages the company is currently permitted to take in. The bottom table shows the proposed tonnages.

### CURRENT

<table>
<thead>
<tr>
<th></th>
<th>Tons Per Year</th>
<th>Tons per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Into the Landfill</strong></td>
<td></td>
<td>6 days/week</td>
</tr>
<tr>
<td>MSW directly into Landfill</td>
<td>24,960</td>
<td>80</td>
</tr>
<tr>
<td>MSW from Processing Facility to Landfill</td>
<td>156,000</td>
<td>500</td>
</tr>
<tr>
<td>Total MSW to Landfill</td>
<td>180,960</td>
<td>580</td>
</tr>
<tr>
<td><strong>Processing Facility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSW to Processing Facility, going to Landfill (same as above)</td>
<td>156,000</td>
<td>500</td>
</tr>
<tr>
<td>MSW to Processing Facility, trucked offsite again</td>
<td>78,000</td>
<td>250</td>
</tr>
<tr>
<td>Total MSW to Processing Facility</td>
<td>234,000</td>
<td>750</td>
</tr>
<tr>
<td><strong>Total to Landfill and Processing Facility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total tonnage going to Landfill (from MSW and Processing)</td>
<td>180,960</td>
<td>580</td>
</tr>
<tr>
<td>Tonnage to Processing Facility not being Landfilled</td>
<td>78,000</td>
<td>250</td>
</tr>
<tr>
<td>Total tonnage going to site (both Landfill and Processing Facility)</td>
<td>258,960</td>
<td>830</td>
</tr>
</tbody>
</table>

### PROPOSED

<table>
<thead>
<tr>
<th></th>
<th>Tons Per Year</th>
<th>Tons per Day</th>
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</thead>
<tbody>
<tr>
<td>MSW into landfill and from Processing Facility</td>
<td>405,600</td>
<td>1,300</td>
</tr>
<tr>
<td>MSW into Processing Facility that is trucked offsite again</td>
<td>93,600</td>
<td>300</td>
</tr>
<tr>
<td>Total MSW to site (Landfill and Processing Facility)</td>
<td>499,200</td>
<td>1,600</td>
</tr>
</tbody>
</table>
Solid Waste Data

<table>
<thead>
<tr>
<th>CURRENT PERMITS</th>
<th>Tons Per Year</th>
<th>Tons per Day</th>
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</thead>
<tbody>
<tr>
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<td></td>
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<table>
<thead>
<tr>
<th>PERMITS REQUESTED</th>
<th>Tons Per Year</th>
<th>Tons per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSW into landfill and from Processing Facility</td>
<td>405,600</td>
<td>1,300</td>
</tr>
<tr>
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</table>

Sample Newsworthy Facts

There’s already 830 tons of garbage going into the site every day. That’s enough.

They’re proposing to bring half a million tons of trash into the site every year.

The proposal would nearly double the total waste going into the site.

The proposal would increase the waste going into the landfill by 125%.

They proposing to put two and a quarter times as much the garbage into the landfill.
Strategies for Reading Data about Pesticides on Food

1. Find something striking
   It could be a fruit or vegetable with the highest or lowest rates of pesticide residue, or one that you and your family eat frequently.

2. Try saying it different ways
   The data for that food is in percents. Try expressing the percent in at least three of the ways below:
   • ___ %
   • ___ out of 100
   • ___ in 10
   • One in ___
   • ___ in ___ (other numbers)
   • A fraction word: a quarter, half, a fifth, two-thirds, etc.

Write down your statements. Circle the statement that seems the strongest.

3. Repeat for a few other foods.
   Did you circle the same phrasing for all the foods, or did it change?

4. Compare foods to each other
   If you’re feeling confident, compare the data from one food to another. If you want to compare the pesticide rates of fruit “A” to the rates in vegetable “B”:
   • A is ___ times B
   • A is ___ % of B
   • A is ___ % lower than B / higher than B
   • A is [double, triple, a quarter of, half of, a fifth of, two-thirds of] B
   • [Draw your own graph or infographic comparing A to B]

5. Choose the one you think makes the most newsworthy statement

Note: Fruits and vegetables are still very good for you! To reduce or avoid pesticides, wash or peel them, buy organic, or grow your own.
Pesticides on Food

An environmental organization (ewg.org) tested many fruits and vegetables in stores for pesticide residue. The graph shows what percent of fruits and vegetables still had pesticides.

Note: Fruits and vegetables are still very good for you! To reduce or avoid pesticides, wash or peel them, buy organic, or grow your own.