Ounces and pounds are customary units of weight. How does the size of a pound compare to the size of an ounce?

**Activity**

**Materials** color pencils

The number line below shows the relationship between pounds and ounces.

<table>
<thead>
<tr>
<th>Pounds</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ounces</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

**STEP 1** Use a color pencil to shade 1 pound on the number line.

**STEP 2** Use a different color pencil to shade 1 ounce on the number line.

**STEP 3** Compare the size of 1 pound to the size of 1 ounce.

You need _____ ounces to make _____ pound.

So, 1 pound is _____ times as heavy as 1 ounce.

- **Math Talk**
  - **Mathematical Practice** Explain how the number line helped you to compare the sizes of the units.

- **Mathematical Practices**
  - MP1, MP6, MP7

- **Attention to Precision** How can you compare the size of 9 pounds to the size of 9 ounces?
Example  Compare measures.

Nancy needs 5 pounds of flour to bake pies for a festival. She has 90 ounces of flour. How can she determine if she has enough flour to bake the pies?

**STEP 1** Make a table that relates pounds and ounces.

<table>
<thead>
<tr>
<th>Pounds</th>
<th>Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Think:

1 pound \times 16 = 16 ounces

2 pounds \times 16 = ____________

3 pounds \times ____ = ____________

4 pounds \times ____ = ____________

5 pounds \times ____ = ____________

**STEP 2** Compare 90 ounces and 5 pounds.

90 ounces

5 pounds

Think: Write each measure in ounces and compare using <, >, or =.

Nancy has 90 ounces of flour. She needs 5 pounds of flour.

90 ounces is _________ than 5 pounds.

So, Nancy _____ enough flour to make the pies.

**Try This!**  There are 2,000 pounds in 1 ton.

Make a table that relates tons and pounds.

<table>
<thead>
<tr>
<th>Tons</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

1 ton is __________ times as heavy as 1 pound.
Share and Show

1. 4 tons = ________ pounds
   
   Think: $4 \text{ tons} \times ________ = ________

Complete.

2. 5 tons = ________ pounds
3. 6 pounds = ________ ounces

On Your Own

Complete.

4. 7 pounds = ________ ounces
5. 6 tons = ________ pounds

Use Symbols Algebra Compare using $>$, $<$, or $=$.

6. 1 pound $\circ$ 15 ounces
7. 2 tons $\circ$ 2 pounds

Problem Solving • Applications

8. A landscaping company ordered 8 tons of gravel. It sells the gravel in 50-pound bags. How many pounds of gravel did the company order?

9. THINK SMARTER If you could draw a number line that shows the relationship between tons and pounds, what would it look like? Explain.

10. THINK SMARTER Write the symbol that compares the weights correctly.

<table>
<thead>
<tr>
<th>160 ounces $\quad$</th>
<th>10 pounds $\quad$</th>
<th>600 pounds $\quad$</th>
<th>3 tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>$&lt;$</td>
<td>$=$</td>
<td>$&gt;$</td>
<td></td>
</tr>
</tbody>
</table>
11. **Go Deeper** Alexis bought \( \frac{1}{2} \) pound of grapes. How many ounces of grapes did she buy?

Dan drew the number line below to solve the problem. He says his model shows that there are 5 ounces in \( \frac{1}{2} \) pound. What is his error?

![Number line]

**Look at the way Dan solved the problem.**

Find and describe his error.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
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<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ounces</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

So, Alexis bought ____ ounces of grapes.

- **Mathematical Practice** Look back at the number line you drew. How many ounces are in \( \frac{1}{4} \) pound? **Explain.**

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Name ________________________________

Customary Units of Weight

Complete.

1. 5 pounds = _______ ounces
   Think: 1 pound = 16 ounces, so
   5 pounds = 5 × 16 ounces, or 80 ounces

2. 7 tons = ____________ pounds

3. 2 pounds = ____________ ounces

4. 3 tons = ____________ pounds

5. 10 pounds = ____________ ounces

Compare using <, >, or =.

6. 8 pounds ___ 80 ounces

7. 1 ton ___ 100 pounds

8. 3 pounds ___ 50 ounces

9. 5 tons ___ 1,000 pounds

10. A company that makes steel girders can produce 6 tons of girders in one day. How many pounds is this?

11. Larry’s baby sister weighed 6 pounds at birth. How many ounces did the baby weigh?

12. Write a problem that can be solved by comparing pounds and ounces using a model. Include a solution. Explain why you are changing from a larger unit to a smaller unit.

   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
Lesson Check (4.MD.A.1)

1. Ann bought 2 pounds of cheese to make lasagna. The recipe gives the amount of cheese needed in ounces. How many ounces of cheese did she buy?

2. A school bus weighs 7 tons. The weight limit for a bridge is given in pounds. What is this weight of the bus in pounds?

Spiral Review (4.NF.B.4c, 4.MD.A.1, 4.MD.C.7, 4.G.A.3)

3. What is the measure of \( \angle EHG \)?

4. How many lines of symmetry does the square below have?

5. To make dough, Reba needs \( 2 \frac{1}{2} \) cups of flour. How much flour does she need to make 5 batches of dough?

6. Judi’s father is 6 feet tall. The minimum height to ride a rollercoaster is given in inches. How many inches tall is Judi’s father?