**Metric Measurement Mania!**

*Be sure your students’ skills measure up with this monstrously fun measurement activity!*

**Purpose:** To estimate and measure metric units of length

**Students will do the following:**
- estimate to the nearest millimeter and centimeter
- measure to the nearest millimeter and centimeter
- calculate the difference between estimates and actual measurements

**Materials for each student:**
- copy of page 6
- pencil
- metric ruler

**Vocabulary to review:**
- centimeters (cm)
- millimeters (mm)
- estimate
- actual
- length

**Extension activities to use after the reproducible:**
- Gauge students’ understanding of various metric units of length with this simple drawing activity. Tell students a specific measurement, such as 10 mm. On blank paper, have them draw lines that they estimate are 10 mm. Then have them use their rulers to check the actual length of the lines. Repeat this exercise for other measurements. To vary the activity, call out a measurement and have students search the classroom for an object that they estimate is that length.

- Take time for some math journal writing with this writing prompt: If you didn’t have a ruler, what would you use to measure a millimeter? What would you use to measure a centimeter?
Metric Measurement Mania!

More than anything, Monty Monster wants to be on the game show *Metric Measurement Mania!* On the show, contestants estimate the size of objects in centimeters and millimeters; then they measure them. The contestant whose estimates are closest wins! Help Monty practice by estimating the length in millimeters of the objects shown below. Then use your metric ruler to measure them.

My estimate _____ mm  
Actual size _____ mm

My estimate _____ mm  
Actual size _____ mm

Monty needs practice working with centimeters, too. Estimate the length of these objects in centimeters; then measure them.

My estimate _____ cm  
Actual size _____ cm

My estimate _____ cm  
Actual size _____ cm

Monty wants to practice some more. To help him, estimate the length of each classroom item listed in the chart below. Some estimates will be in millimeters and others in centimeters. Then measure the actual items. Finally, calculate the difference between the 2 measurements to find out how close your estimate was to the actual length.

<table>
<thead>
<tr>
<th>Object</th>
<th>Estimate</th>
<th>Actual</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>your pencil (cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>crayon (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>teacher’s desk (cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>math book (cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>your little finger (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chalk (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Bonus Box:** Using your measurements in the chart above, change the millimeter measurements to centimeters. Change the centimeter measurements to millimeters. Write these new numbers beside your original numbers. If necessary, round the measurements to the nearest whole number.
All Abuzz About Measurement

Give your busy bees a chance to build their customary measurement skills!

**Purpose:** To measure customary units of length

**Students will do the following:**
- draw lines measured by the inch and half inch
- follow directions to create a picture of a house

**Materials for each student:**
- copy of page 8
- pencil
- ruler
- 12” x 18” construction paper or other large-size paper
- crayons or colored pencils

**Vocabulary to review:**
- inch
- half inch

**Extension activities to use after the reproducible:**
- Strengthen students’ customary measurement skills with this simple trade-a-card activity. Create a supply of index cards with horizontal, vertical, and diagonal lines drawn to various inch and half-inch lengths. Give each student a card, a pencil, a ruler, and paper. Have students measure the lines on their cards and write the measurements on the paper. Then have students switch cards and check one another’s results. Repeat with new cards.

- Here’s an easy-to-make game that can help students get ahead with their measurement skills. Create a supply of index cards with a measurement from one-half inch to two inches written on each card. Give pairs of students two colored pencils, a ruler, and paper. To play the game, called The Great Paper Chase, one child chooses a card. Using the ruler, he starts at one edge of the paper and draws a line of the length indicated. The next student chooses a card. Starting at the opposite edge of the paper, she draws a line of the length indicated. Students continue choosing cards and drawing lines of different colors in a race to see whose line reaches the other side of the paper first.
All Abuzz About Measurement

The Busy Bee Building Company has buzzed into town to build a new house on your street. The bees need some help in figuring out exactly how the house should look, so they have hired you to be their chief architect. Follow the directions below to draw a 2-story house on a separate piece of paper. Use your ruler to measure the parts of the house carefully.

1. Make the house 10 inches high. This does not include the roof. Add a roof of any shape.
2. Make the house 8 inches wide.
3. Draw 2 windows on the first floor. Make each window 2 inches high and 2 inches wide.
4. Draw 3 windows on the second floor. Make 2 of the windows 1 \(\frac{1}{2}\) inches wide and 2 inches high. Make the third window any size you’d like.
5. Add a door that’s 3 inches high and 1 \(\frac{1}{2}\) inches wide.
6. Put flowerboxes under the 3 second-floor windows. Make each flowerbox \(\frac{1}{2}\) inch tall and 2 \(\frac{1}{2}\) inches wide.
7. Draw a doorknob 1 \(\frac{1}{2}\) inches from the top of the door.
8. Add a chimney to the roof. Make the chimney 1 inch wide and as tall as you’d like.
9. Add curtains, trees, bushes, a sidewalk, flowers, a fence, and any other details you’d like. If desired, color your house.

Bonus Box: On the back of your paper, draw a square garage. Make each side 3 \(\frac{1}{2}\) inches. Add a garage door and window. Draw a car beside it.
A Whale of an Assignment

Let students spout off their knowledge of changing customary units of length with this terrific assignment!

**Purpose:** To change customary units of length

**Students will do the following:**
- change inches to feet and feet to inches
- change feet to yards and yards to feet

**Materials for each student:**
- copy of page 10
- pencil
- calculator (optional)

**Vocabulary to review:**
- inches
- feet
- yards

**Extension activities to use after the reproducible:**
- Review changing customary units of length with a tic-tac-toe game that stresses mental math skills. First, have each student make a large tic-tac-toe grid on a sheet of paper. Next, call out nine measurements (see the list below), directing each student to randomly write one per grid box. To play, call out an equivalent measurement for each measurement that students have written. Jot down a key for easy checking. Direct each student to find and circle the measurement in his grid that is equivalent to the one you called out. The first student who correctly circles three measurements in a row is the winner.

<table>
<thead>
<tr>
<th>Inches</th>
<th>Feet</th>
<th>Yards</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 in. = 2 ft.</td>
<td>2 yd. = 72 in.</td>
<td>16 in. = 1 ft. 4 in.</td>
</tr>
<tr>
<td>3 ft. = 1 yd.</td>
<td>4 ft. = 48 in.</td>
<td>1 ft. 8 in. = 20 in.</td>
</tr>
<tr>
<td>9 ft. = 3 yd.</td>
<td>60 in. = 5 ft.</td>
<td>3 yd. 1 ft. = 10 ft.</td>
</tr>
</tbody>
</table>

- Give students more practice with customary units of length with an estimation activity that has them scrutinizing classroom objects. On a sheet of chart paper, write the following column headings: “inches,” “feet,” and “yards.” Have students brainstorm items in the classroom that would be measured using each unit. List each one in the appropriate column on the chart paper; then call on a volunteer to estimate its length. After you’ve listed about five or six items in each column, divide students into pairs. Assign each pair an object from the chart to measure. Which estimates were the most accurate?
A Whale of an Assignment

Willy the Whale is studying marine biology. And look where his research has led him—to his own species! Use the data that Willy has collected to complete the measurement tasks below.

**Remember:**

<table>
<thead>
<tr>
<th>12 in. = 1 ft.</th>
<th>3 ft. = 1 yd.</th>
<th>36 in. = 1 yd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To change a large unit to a smaller unit, <strong>multiply.</strong></td>
<td></td>
<td>To change a small unit to a larger unit, <strong>divide.</strong></td>
</tr>
<tr>
<td>5 ft. = <em><strong>?</strong></em> in.</td>
<td></td>
<td>69 ft. = <em><strong>?</strong></em> yd.</td>
</tr>
<tr>
<td>1 ft. = 12 in.</td>
<td></td>
<td>3 ft. = 1 yd.</td>
</tr>
<tr>
<td>5 x 12 = 60</td>
<td></td>
<td>69 ÷ 3 = 23</td>
</tr>
<tr>
<td>5 ft. = 60 in.</td>
<td></td>
<td>69 ft. = 23 yd.</td>
</tr>
</tbody>
</table>

**Directions:** Each whale’s length is given in 1 unit. Change each length to the other 2 units. The humpback whale’s measurements have been done for you.

**Blue whale:** 100 ft.

\[
\begin{align*}
\text{in.} & \quad \text{yd.} & \quad \text{ft.} \\
\hline
\text{720} & \quad \text{20} & \quad 62 \\
\end{align*}
\]

**Beluga:** 5 yd.

\[
\begin{align*}
\text{in.} & \quad \text{ft.} \\
\hline
\text{60} & \quad 5 \\
\end{align*}
\]

**Sperm whale:** 55 ft.

\[
\begin{align*}
\text{in.} & \quad \text{yd.} & \quad \text{ft.} \\
\hline
\text{660} & \quad 20 & \quad 55 \\
\end{align*}
\]

**Minke whale:** 396 in.

\[
\begin{align*}
\text{ft.} & \quad \text{yd.} \\
\hline
\text{33} & \quad 11 \\
\end{align*}
\]

**Humpback whale:** 62 ft.

\[
\begin{align*}
\text{in.} & \quad \text{yd.} & \quad \text{ft.} \\
\hline
\text{744} & \quad 20 & \quad 62 \\
\end{align*}
\]

**Pilot whale:** 252 in.

\[
\begin{align*}
\text{ft.} & \quad \text{yd.} \\
\hline
\text{21} & \quad 7 \\
\end{align*}
\]

**Gray whale:** 504 in.

\[
\begin{align*}
\text{ft.} & \quad \text{yd.} \\
\hline
\text{42} & \quad 14 \\
\end{align*}
\]

**Killer whale:** 10 yd.

\[
\begin{align*}
\text{in.} & \quad \text{ft.} \\
\hline
\text{120} & \quad 10 \\
\end{align*}
\]

**Sei whale:** 60 ft.

\[
\begin{align*}
\text{in.} & \quad \text{yd.} \\
\hline
\text{720} & \quad 20 \\
\end{align*}
\]

**Bonus Box:** Order the 9 whales above from shortest to longest.