Meter Sticks and Expanded Decimals

Using Your Meter Paper:
- Find an object in the room that is longer than 0.1 m, but shorter than 1 m.
- Use your paper meter strip to measure it. First find how many full tenths fit within the length. Next find how many extra hundredths there are.
- Select the decimal card that has the number of tenths.
- Select the decimal card that has the number of extra hundredths.
- Layer the tenths card on top of the hundredths card to see the standard decimal form.
- Show the tenths, hundredths, and standard decimal form using a number bond.
- Record the name of the object, the tenths, the hundredths, and the standard decimal form below.
- Repeat for 3 more objects.

Object 1 Name: _________________________________
_________ + ___________ = ___________
tenths       hundredths       standard decimal form

Object 2 Name: _________________________________
_________ + ___________ = ___________
tenths       hundredths       standard decimal form

Object 3 Name: _________________________________
_________ + ___________ = ___________
tenths       hundredths       standard decimal form

Object 4 Name: _________________________________
_________ + ___________ = ___________
tenths       hundredths       standard decimal form
Using A Meter Stick:
• Find an object in the room that is longer than 0.1 m, but shorter than 1 m.
• Use your meter stick to measure it. First find how many full tenths fit within the length. Next find how many extra hundredths will fit. Finally, read how many extra thousandths there are.
• Select the decimal cards that match the number of tenths, hundredths, and thousandths.
• Layer the three cards to see the standard decimal form.
• Record the name of the object, the tenths, the hundredths, the thousandths, and the standard decimal form below.
• Show the tenths, hundredths, thousandths, and standard decimal form using a number bond.
• Repeat for 3 more objects.

Object 5 Name: _________________________________

_________  +  ____________ +  ____________  =  ____________
tenths             hundredths              thousandths      standard decimal form

Object 6 Name: _________________________________

_________  +  ____________ +  ____________  =  ____________
tenths             hundredths              thousandths      standard decimal form

Object 7 Name: _________________________________

_________  +  ____________ +  ____________  =  ____________
tenths             hundredths              thousandths      standard decimal form

Object 8 Name: _________________________________

_________  +  ____________ +  ____________  =  ____________
tenths             hundredths              thousandths      standard decimal form
Estimating to the Nearest Hundredth:

Object 9 Name: _________________________________

__________ + ___________ = ___________

tenths     hundredths     standard decimal form

Object 10 Name: _________________________________

__________ + ___________ = ___________

tenths     hundredths     standard decimal form

Estimating to the Nearest Thousandth:

Object 11 Name: _________________________________

__________ + ___________ + ___________ = ___________

tenths     hundredths     thousandths     standard decimal form

Object 12 Name: _________________________________

__________ + ___________ + ___________ = ___________

tenths     hundredths     thousandths     standard decimal form

Bonus:
Which object did you estimate best? Show your estimate and the measured value below. Use any method you can to find how far apart your estimate was from the measured value.
Teacher Directions: Meter Sticks and Expanded Decimals

Materials:
- Meter Strips of Paper, marked from Building a Meter Stick lesson.
- Decimal Place Value Cards (at least 1 set per group, preferably 1 per pair)
- Index Cards, cut to 10 cm long with 1 cm marks (at least 1 per pair of students)
- Meter Sticks (at least 1 per group, preferably 1 per pair)

Objective:
Students will write and understand the expanded form of a decimal to the hundredths or thousandths place through the use of a meter stick and layered decimal cards.

BIG IDEA:
To help students make sense of place value, we build numbers beginning with tenths, then add additional hundredths, and then add additional thousandths. We match it to the actual measurement, layer the Place Value Cards, and use number bonds to REALLY understand what a number is, which is crucial for operations with decimals.

Directions:
The first four objects will be measured just using the meter strip of paper and will be measured to the nearest hundredth of a meter. Use the pen on page four as a shared first object to measure. Walk through the directions with the class that are on page one and make sure all students can see and agree about the length of the picture of the pen. Have a student demonstrate in front of the class how to layer the decimal cards.

Object 1 Name: Black Pen

\[
\begin{align*}
0.2 + 0.04 &= 0.24 \\
\text{tenths} &+ \text{hundredths} = \text{standard decimal form}
\end{align*}
\]

\[
\begin{array}{c|c|c}
0 & .2 & 4 \\
\end{array}
\]

Give students time to find three more objects with lengths between 0.1 meter and 1 meter to measure. As most teams are finishing, have each team present one object, let the class estimate its measure, then have the team say how long it was.
Have students put away their meter strips of paper and switch to using meter sticks to measure objects 5 to 8. Repeat the process of having teams present an object, letting the class estimate its length, and then hearing the measured length.

If there is time, you may select up to 4 objects for students to write estimates for. These can be written on page 3. After all estimates are complete you may collect the papers or have them trade with other teams before measuring the objects and seeing who was closest.