GRADE 4 MODULE 1

Place Value, Rounding, and Algorithms for Addition and Subtraction

Topic A: Place Value of Multi-Digit Whole Numbers

- recognize that each sequence of three digits is read as hundreds, tens, and ones followed by the naming of the corresponding base thousand unit (thousand, million, billion).

- 10 hundreds can be composed into 1 thousand and, therefore, 30 hundreds can be composed into 3 thousands because a digit's value is ten times what it would be one place to its right

- Similarly, multiplying by 10 will shift digits one place to the left, and dividing by 10 will shift digits one place to the right.

$$3,000 = 300 \times 10 \qquad\qquad 3,000 \div 10 = 300$$

$10 \times (3\text{ hundreds } 2\text{ tens}) = 3\text{ thousands } 2\text{ hundreds}$
$= 3,200$

thousands	hundreds	tens	ones
3	×10 3	×10 2	
	3	2	

$(4\text{ ten thousands } 2\text{ tens}) \div 10 = 4\text{ thousands } 2\text{ ones}$
$= 4,002$

ten thousands	thousands	hundreds	tens	ones
4 ÷10			2 ÷10	
	4			2

- Standard form: 1,708
- Expanded form: $1,000 + 700 + 8 = 1,708$
- Word form: one thousand, seven hundred eight

Topic B: Comparing Multi-Digit Whole Numbers

- in comparing 12,566 to 19,534, it is evident that 19 thousand is greater than 12 thousand because of the meaning of the digits in the thousands

- For example, it becomes clear that 34,156 is 3 thousand greater than 31,156.
  $$56 > 31,156$$

Topic C: Rounding Multi-Digit Whole Numbers

Step 1:
- Strategically decompose number using multiple units to round to the nearest . . . .
  Example: Round 155 to the nearest hundred.
    Name 155 using as many hundreds as possible. Then name it using as many tens as possible, and then using as many ones as possible. Record you ideas on your place value chart.

| 1 hundred	5 tens	5 ones	●
	15 tens	5 ones	●
		155 ones	●

Step 2:
- Look at the decompositions and decide which one will help you round this number to the nearest . . .
  Example: Round 155 to the nearest hundred.
    The one that shows 1 hundred. I can see that 155 is between 1 hundred and 2 hundreds.
    This helps me see that 155 is between 1 hundred and 2 hundreds on the number line.
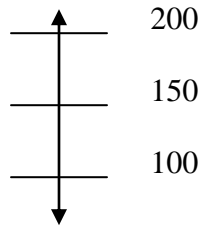   Record that on the number line.

200

100
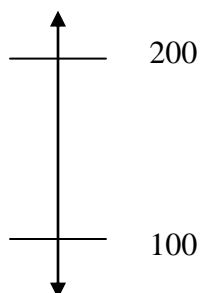
Step 3:

- Determine what the midpoint and mark it on the number line.
  Example:
    The midpoint between 1 hundred and 2 hundreds is 150.

```
  ▲
——┤——   200
  |
——┼——   150
  |
——┤——   100
  |
  ▼
```
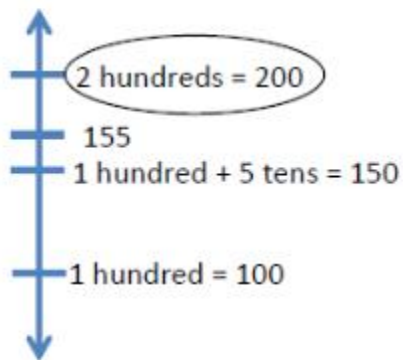
Step 4:

- Then place your number on the number line to determine which number you round to.
  Example:
    155 is past the midpoint, so 155 is closer to 2 hundreds. It rounds up to 200.

```
  ▲
——┤——  (2 hundreds = 200)
 ═══  155
——┤══  1 hundred + 5 tens = 150

——┼──  1 hundred = 100
  |
  ▼
```

Topic D: Multi-Digit Whole Number Addition

- Recording of the regrouping occurs on the line under the addends as shown to the right. For example, in the ones column, students do not record the 0 in the ones column and the 1 above the tens column, instead students record 10, writing the 1 under the tens column and then a 0 in the ones column.

$$755,206$$
$$+ \quad 89,814$$
$$845,020$$

$$3,134$$
$$+2,493$$
$$5,627$$

Topic E: Multi-Digit Whole Number Subtraction

- Moving slowly from smaller to larger minuends, students practice decomposing larger units into smaller units. Students continue to decompose all necessary digits before performing the algorithm, allowing subtraction from left to right.

$$420,061$$
$$- \quad 56,328$$
$$363,733$$

$$4,259$$
$$-2,171$$
$$2,088$$

Topic F: Addition and Subtraction Word Problems

Solve a single-step word problems using how much more.

Sean's school raised $32,587. Leslie's school raised $18,749.
How much more money did Sean's school raise?

$32,587

S [   ]

L [   ]

$18,749   M

$$\begin{array}{r} 2\overset{1}{\cancel{3}}\,\overset{15}{\cancel{2}}\overset{7}{\cancel{5}}\,\overset{17}{\cancel{8}} \\ 32,587 \\ -18,749 \\ \hline 13,838 \end{array}$$

Sean's school raised $13,838
more than Leslie's school.
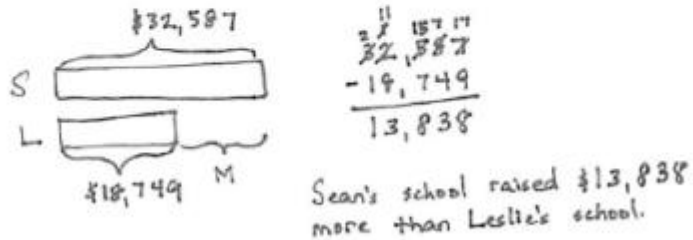
Solve a multi-step word problem, requiring addition and subtraction, using a tape diagram, and checking the reasonableness of the answer using estimation.

In one year, a factory used 11,650 meters of cotton, 4,950 fewer meters of silk than cotton, and 3,500 fewer meters of wool than silk. How many meters in all were used of the three fabrics?

C [11,650 m]

S [   ]

W [ ]   4,950   } ?
                              .
    3,500

$$\begin{array}{r} C\,\overset{0}{1}\overset{16}{1},\cancel{650} \\ -\ 4,950 \\ \hline S\ 6,700 \end{array}$$

$$\begin{array}{r} S6,700 \\ -3,500 \\ \hline W3,200 \end{array}$$

$$\begin{array}{r} 11,650 \\ 6,700 \\ +\ 3,200 \\ \hline 21,550 \end{array}$$

21,550 m of fabric
was used.