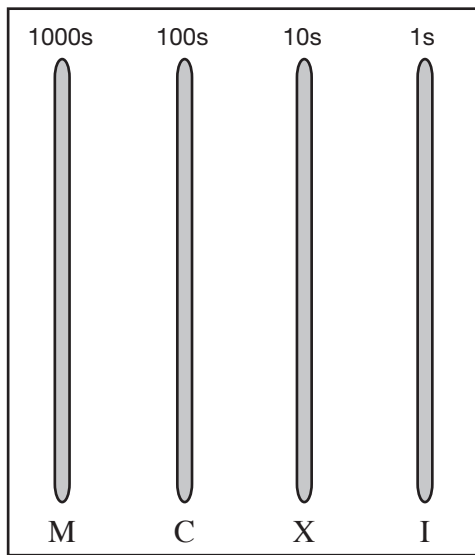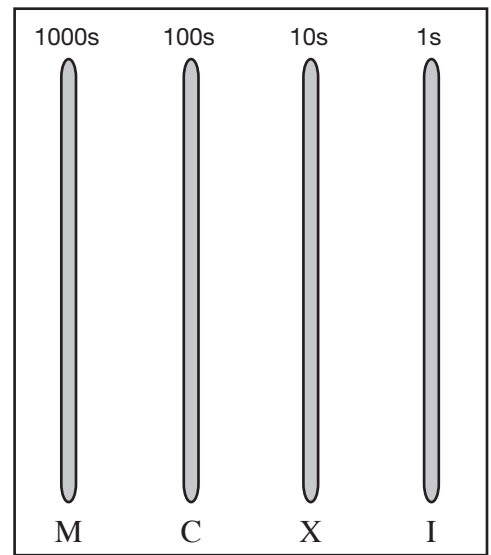# Helping Leonardo the Traveler Solve Problems

In the beginning of the story, Leonardo learned to use the abacus. Use the pictures below to show numbers the way Leonardo's father taught him.

1. **A.** Draw pebbles on the abacus to show 680.

1000s	100s	10s	1s
M	C	X	I

B. Draw pebbles on the abacus to show 1905.

1000s	100s	10s	1s
M	C	X	I

C. Use base-ten shorthand to show each of these numbers. Use the Fewest Pieces Rule.

680

1905

Name _____ Date _____

Complete the questions. Use the *Addition Strategies Menu* and the *Subtraction Strategies Menu* in the Referece section when needed.

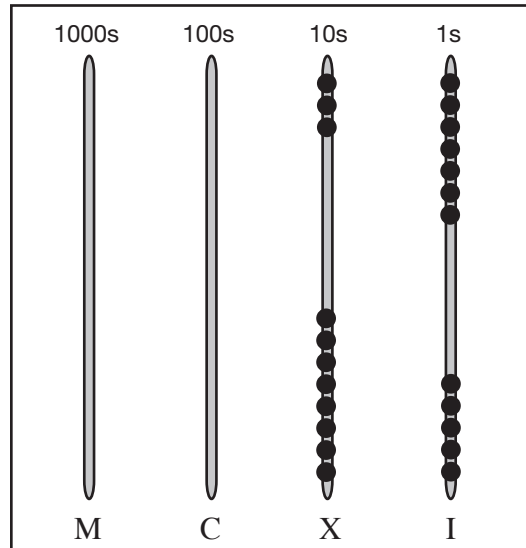**2. A.** What two numbers are shown on the abacus?
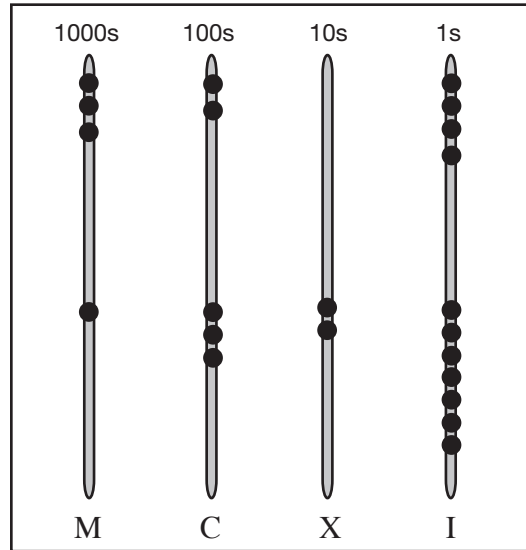
B. Add these two numbers together using the compact method.

```
1000s    100s    10s    1s

  M        C       X      I
```

3. The Arab teacher, Ali, showed Leonardo how to combine the two numbers shown on the abacus.

A. What number is shown on the top part of the abacus?

B. What number is shown on the bottom part of the abacus?

```
1000s    100s    10s    1s

  M        C       X      I
```

C. Show Leonardo how to add the numbers shown on the abacus using expanded form and a number line.

4. A. The problem that Ali showed Leonardo is below. Help Leonardo finish the problem.

$$
\begin{array}{r}
\overset{1}{3}7 \\
+\ 85 \\
\hline
2
\end{array}
$$

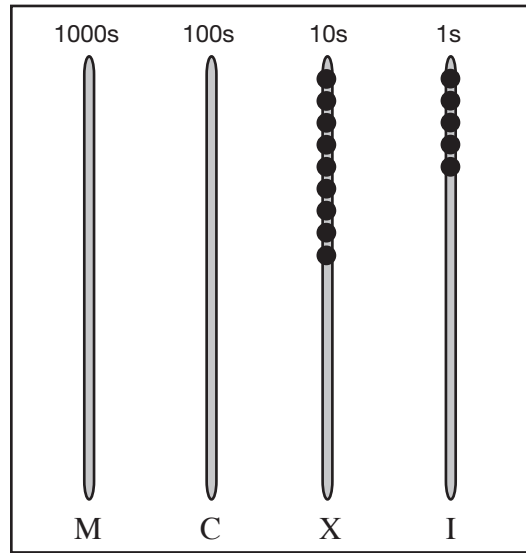**B.** What does the little one above the 3 stand for?

5. Help Leonardo solve the problem using the compact method. Think of base-ten pieces and show your trades.

$$
\begin{array}{r}
95 \\
-\ 37 \\
\hline
\end{array}
$$

6. Look at the abacus that Leonardo used to show 95 in the problem 95 – 37.

1000s	100s	10s	1s
M	C	X	I

A. How many tens and how many ones does the abacus show?

B. Write a number sentence for what the abacus shows.

7. Look at the way Leonardo made trades on the abacus.

1000s	100s	10s	1s
M	C	X	I

A. How many tens and how many ones does the abacus show now?

B. Does the abacus still show a number that is equal to 95? Tell how you know.
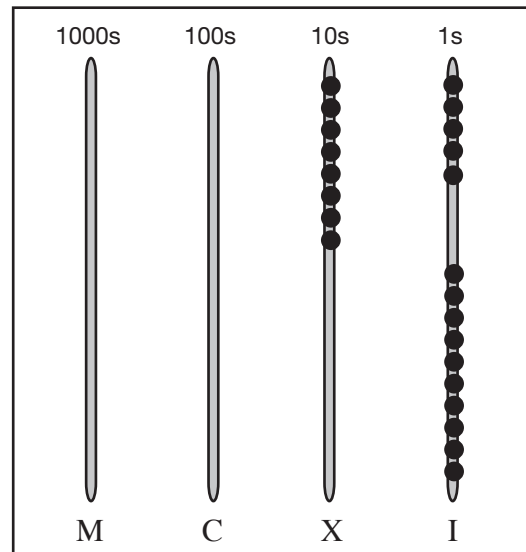
C. Write a number sentence for what the abacus shows.

D. Show Leonardo how to use counting up to solve 95 – 37.

8. Leonardo and Omar solved this problem.

   A. What does the 7 above the 8 stand for?

$$\begin{array}{r} {\overset{7}{\cancel{8}}\overset{14}{\cancel{4}}} \\ -\ 25 \\ \hline 59 \end{array}$$

   B. What does the 14 above the 4 stand for?

   C. Complete the number sentence below
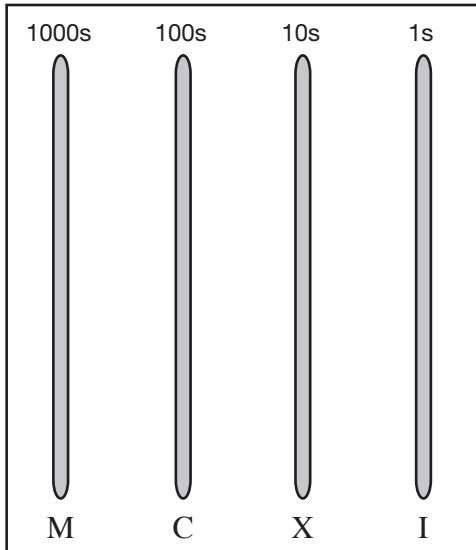   to show 84 after trades are made.

   70 + _____ = 84

   D. Omar wrote the number sentence 7 + 14 = 84.

   Do you agree with Omar? Why or why not?

   E. Show Leonardo how to use expanded form to solve 84 – 25.

9. Show Leonardo how to solve 275 – 196 = _____ using counting back
   on a number line.

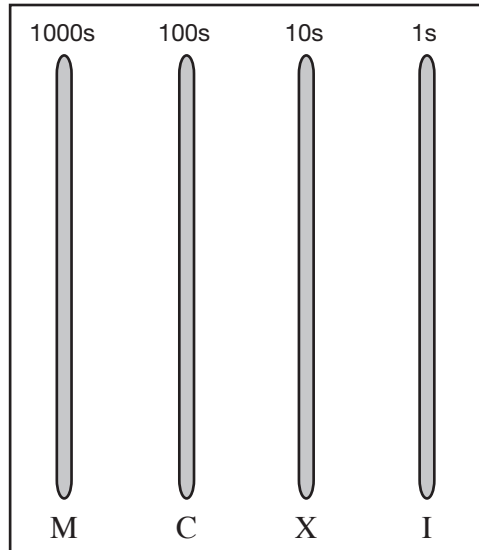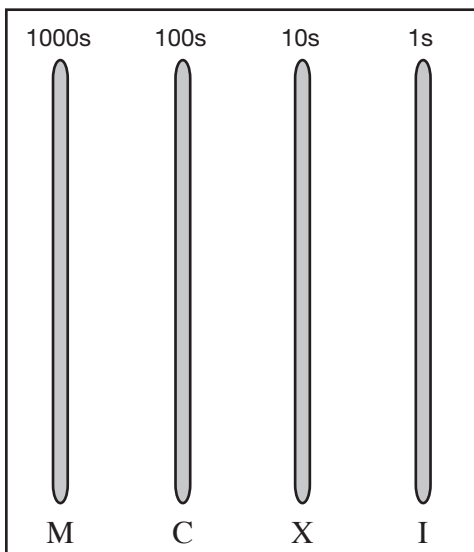**10. A.** Draw pebbles on the abacus to show 42.

1000s	100s	10s	1s
M	C	X	I

Number sentence:

_____

B. Draw pebbles on the abacus to show 42 another way.

1000s	100s	10s	1s
M	C	X	I

Number sentence:

_____

C. Use the abacus to show 42 – 17.

1000s	100s	10s	1s
M	C	X	I

Number sentence:

_____

D. Solve 42 – 17 using expanded form.

E. Compare the abacus strategy to the expanded form. How are they similar?

Name _____ Date _____

Helping Leonardo the Traveler Solve Problems Feedback Box	Expectation	Check In	Comments
Apply place value concepts to make connections among representations of numbers to the thousands using base-ten pieces and number lines. (Q# 1–10)	E8		
Represent and solve subtraction problems using base-ten pieces and number lines. (Q# 5, 6, 9)	E2		
Subtract multidigit numbers using mental math strategies (e.g., composing and decomposing numbers and counting up). (Q# 7, 9)	E3		
Subtract multidigit numbers using paper-and-pencil methods (e.g., expanded form, and compact). (Q# 5, 8, 10)	E4		