

Table 1: Addition and subtraction situations

|                                 | Result Unknown  | Change Unknown  | Start Unknown   |
|---------------------------------|---|---|---|
| <b>Add To</b>                   | <p><i>A</i> bunnies sat on the grass. <i>B</i> more bunnies hopped there. How many bunnies are on the grass now?</p> $A + B = \square$  | <p><i>A</i> bunnies were sitting on the grass. Some more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies hopped over to the first <i>A</i> bunnies?</p> $A + \square = C$  | <p>Some bunnies were sitting on the grass. <i>B</i> more bunnies hopped there. Then there were <i>C</i> bunnies. How many bunnies were on the grass before?</p> $\square + B = C$   |
| <b>Take From</b>                | <p><i>C</i> apples were on the table. I ate <i>B</i> apples. How many apples are on the table now?</p> $C - B = \square$  | <p><i>C</i> apples were on the table. I ate some apples. Then there were <i>A</i> apples. How many apples did I eat?</p> $C - \square = A$  | <p>Some apples were on the table. I ate <i>B</i> apples. Then there were <i>A</i> apples. How many apples were on the table before?</p> $\square - B = A$   |
|                                 | Total Unknown   | Both Addends Unknown <sup>1</sup>   | Addend Unknown <sup>2</sup>   |
| <b>Put Together /Take Apart</b> | <p><i>A</i> red apples and <i>B</i> green apples are on the table. How many apples are on the table?</p> $A + B = \square$  | <p>Grandma has <i>C</i> flowers. How many can she put in her red vase and how many in her blue vase?</p> $C = \square + \square$  | <p><i>C</i> apples are on the table. <i>A</i> are red and the rest are green. How many apples are green?</p> $A + \square = C$ $C - A = \square$  |
|                                 | Difference Unknown  | Bigger Unknown  | Smaller Unknown   |
| <b>Compare</b>                  | <p><i>"How many more?"</i> version. Lucy has <i>A</i> apples. Julie has <i>C</i> apples. How many more apples does Julie have than Lucy?</p> <p><i>"How many fewer?"</i> version. Lucy has <i>A</i> apples. Julie has <i>C</i> apples. How many fewer apples does Lucy have than Julie?</p> $A + \square = C$ $C - A = \square$ | <p><i>"More"</i> version suggests operation. Julie has <i>B</i> more apples than Lucy. Lucy has <i>A</i> apples. How many apples does Julie have?</p> <p><i>"Fewer"</i> version suggests wrong operation. Lucy has <i>B</i> fewer apples than Julie. Lucy has <i>A</i> apples. How many apples does Julie have?</p> $A + B = \square$ | <p><i>"Fewer"</i> version suggests operation. Lucy has <i>B</i> fewer apples than Julie. Julie has <i>C</i> apples. How many apples does Lucy have?</p> <p><i>"More"</i> suggests wrong operation. Julie has <i>B</i> more apples than Lucy. Julie has <i>C</i> apples. How many apples does Lucy have?</p> $C - B = \square$ $\square + B = C$ |

In each type (shown as a row), any one of the three quantities in the situation can be unknown, leading to the subtypes shown in each cell of the table. The table also shows some important language variants which, while mathematically the same, require separate attention. Other descriptions of the situations may use somewhat different names. Adapted from CCSS, p. 88, which is based on *Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity*, National Research Council, 2009, pp. 32–33.

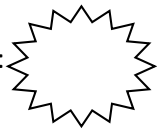
<sup>1</sup> This can be used to show all decompositions of a given number, especially important for numbers within 10. Equations with totals on the left help children understand that = does not always mean "makes" or "results in" but always means "is the same number as." Such problems are not a problem subtype with one unknown, as is the Addend Unknown subtype to the right. These problems are a productive variation with two unknowns that give experience with finding all of the decompositions of a number and reflecting on the patterns involved.

<sup>2</sup> Either addend can be unknown; both variations should be included.

|          |         |         |         |         |         |         |         |         |         |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| $1 + 0$  | $1 + 1$ | $1 + 2$ | $1 + 3$ | $1 + 4$ | $1 + 5$ | $1 + 6$ | $1 + 7$ | $1 + 8$ | $1 + 9$ |
| $2 + 0$  | $2 + 1$ | $2 + 2$ | $2 + 3$ | $2 + 4$ | $2 + 5$ | $2 + 6$ | $2 + 7$ | $2 + 8$ |         |
| $3 + 0$  | $3 + 1$ | $3 + 2$ | $3 + 3$ | $3 + 4$ | $3 + 5$ | $3 + 6$ | $3 + 7$ |         |         |
| $4 + 0$  | $4 + 1$ | $4 + 2$ | $4 + 3$ | $4 + 4$ | $4 + 5$ | $4 + 6$ |         |         |         |
| $5 + 0$  | $5 + 1$ | $5 + 2$ | $5 + 3$ | $5 + 4$ | $5 + 5$ |         |         |         |         |
| $6 + 0$  | $6 + 1$ | $6 + 2$ | $6 + 3$ | $6 + 4$ |         |         |         |         |         |
| $7 + 0$  | $7 + 1$ | $7 + 2$ | $7 + 3$ |         |         |         |         |         |         |
| $8 + 0$  | $8 + 1$ | $8 + 2$ |         |         |         |         |         |         |         |
| $9 + 0$  | $9 + 1$ |         |         |         |         |         |         |         |         |
| $10 + 0$ |         |         |         |         |         |         |         |         |         |

A

Number correct:



Name \_\_\_\_\_

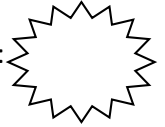
Date \_\_\_\_\_

\*Write the missing number from each subtraction sentence. Pay attention to the + and - signs.

|    |                     |  |    |                    |  |
|----|---------------------|--|----|--------------------|--|
| 1  | $9 + 1 = \square$   |  | 16 | $10 - 7 = \square$ |  |
| 2  | $1 + 9 = \square$   |  | 17 | $10 = 7 + \square$ |  |
| 3  | $10 - 1 = \square$  |  | 18 | $10 = 3 + \square$ |  |
| 4  | $10 - 9 = \square$  |  | 19 | $10 = 6 + \square$ |  |
| 5  | $10 + 0 = \square$  |  | 20 | $10 = 4 + \square$ |  |
| 6  | $0 + 10 = \square$  |  | 21 | $10 = 5 + \square$ |  |
| 7  | $10 - 0 = \square$  |  | 22 | $10 - \square = 5$ |  |
| 8  | $10 - 10 = \square$ |  | 23 | $5 = 10 - \square$ |  |
| 9  | $8 + 2 = \square$   |  | 24 | $6 = 10 - \square$ |  |
| 10 | $2 + 8 = \square$   |  | 25 | $7 = 10 - \square$ |  |
| 11 | $10 - 2 = \square$  |  | 26 | $7 = \square - 3$  |  |
| 12 | $10 - 8 = \square$  |  | 27 | $4 = 10 - \square$ |  |
| 13 | $7 + 3 = \square$   |  | 28 | $5 = \square - 5$  |  |
| 14 | $3 + 7 = \square$   |  | 29 | $6 = 10 - \square$ |  |
| 15 | $10 - 3 = \square$  |  | 30 | $7 = \square - 3$  |  |

**B**

Number correct:



Name \_\_\_\_\_

Date \_\_\_\_\_

\*Write the missing number from each number sentence. Pay attention to the + and - signs.

|    |                     |  |    |                    |  |
|----|---------------------|--|----|--------------------|--|
| 1  | $8 + 2 = \square$   |  | 16 | $10 - 6 = \square$ |  |
| 2  | $2 + 8 = \square$   |  | 17 | $10 = 8 + \square$ |  |
| 3  | $10 - 2 = \square$  |  | 18 | $10 = 7 + \square$ |  |
| 4  | $10 - 8 = \square$  |  | 19 | $10 = 3 + \square$ |  |
| 5  | $9 + 1 = \square$   |  | 20 | $10 = 4 + \square$ |  |
| 6  | $1 + 9 = \square$   |  | 21 | $10 = 5 + \square$ |  |
| 7  | $10 - 1 = \square$  |  | 22 | $10 - \square = 5$ |  |
| 8  | $10 - 9 = \square$  |  | 23 | $6 = 10 - \square$ |  |
| 9  | $10 + 0 = \square$  |  | 24 | $7 = 10 - \square$ |  |
| 10 | $0 + 10 = \square$  |  | 25 | $8 = 10 - \square$ |  |
| 11 | $10 - 0 = \square$  |  | 26 | $7 = \square - 3$  |  |
| 12 | $10 - 10 = \square$ |  | 27 | $2 = 10 - \square$ |  |
| 13 | $6 + 4 = \square$   |  | 28 | $4 = \square - 6$  |  |
| 14 | $4 + 6 = \square$   |  | 29 | $3 = 10 - \square$ |  |
| 15 | $10 - 4 = \square$  |  | 30 | $7 = \square - 3$  |  |

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Solve each problem with a written strategy such as a tape diagram, a number bond, the arrow way, the vertical method, or chips on a place value chart.

|  |  |  |
|--|--|--|
| <p>a.</p> $460 + 200 = \underline{\hspace{2cm}}$ | <p>b.</p> $\underline{\hspace{2cm}} = 865 - 300$ | <p>c.</p> $\underline{\hspace{2cm}} + 400 = 598$ |
| <p>d.</p> $240 - 190 = \underline{\hspace{2cm}}$ | <p>e.</p> $\underline{\hspace{2cm}} = 760 - 280$ | <p>f.</p> $330 - 170 = \underline{\hspace{2cm}}$ |

2. Use the arrow way to complete the number sentences. Use place value drawings if that will help you.

|  |  |   |
|--|--|---|
| <p>a.</p> $\begin{array}{ccc} & -400 & +10 \\ 630 & \rightarrow & \underline{\hspace{1cm}} \rightarrow \underline{\hspace{1cm}} \end{array}$ $630 - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$ | <p>b.</p> $\begin{array}{ccc} & -\underline{\hspace{1cm}} & +\underline{\hspace{1cm}} \\ 570 & \rightarrow & 270 \rightarrow 290 \end{array}$ $570 - \underline{\hspace{2cm}} = 290$ | <p>c.</p> $\begin{array}{ccc} & -400 & -40 \\ \underline{\hspace{1cm}} & \rightarrow & \underline{\hspace{1cm}} \rightarrow 518 \end{array}$ $\underline{\hspace{2cm}} - 440 = 518$ |
|--|--|---|