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| **GRADE 1: COMMON ADDITION AND SUBTRACTION PROBLEM TYPES** | | |
| Join  (Result Unknown) | Join  (Change Unknown) | Join  (Start Unknown) |
| Sue had 9 pencils. Alex gave her 5 more pencils. How many pencils does Sue have all together? | Sue had 9 pencils. Alex gave her some more pencils. Now Sue has 14 pencils. How many did Alex give her? | Sue had some pencils. Alex gave her 5 more. Now Sue has 14 pencils. How many pencils did Sue have to start with? |
| Separate  (Result Unknown) | Separate  (Change Unknown) | Separate  (Start Unknown) |
| Brooke had 10 cookies. She gave 6 cookies to Joe. How many cookies does Brooke have now? | Brooke had 10 cookies. She gave some to Joe. She has 4 cookies left. How many cookies did Brooke give to Joe? | Brooke had some cookies. She gave 6 to Joe. Now she has 4 cookies left. How many cookies did Brooke start with? |
| Part-Part-Whole  (Whole Unknown) | Part-Part-Whole  (One Part Unknown) | Part-Part-Whole  (Both Parts Unknown) |
| Lisa has 4 red markers and 8 blue markers. How many markers does she have? | Lisa has 12 markers. Four of the markers are red, and the rest are blue. How many blue markers does Lisa have? | Lisa has a pack of red and blue markers. She has 12 markers in all. How many markers could be red? How many could be blue? |
| Compare  (Difference Unknown) | Compare  (Bigger Unknown) | Compare  (Smaller Unknown) |
| Ryan has 7 books and Chris has 2 books. How many more books does Ryan have than Chris?  Ryan has 7 books. Chris has 2 books. How many fewer books does Chris have than Ryan? | Chris has 2 books. Ryan has 5 more books than Chris. How many books does Ryan have?  Chris has 5 fewer books than Ryan. Chris has 2 books. How many books does Ryan have? | Ryan has 2 more books than Chris. Ryan has 7 books. How many books does Chris have?  Chris has 5 fewer books than Ryan. Ryan has 7 books. How many books does Chris have? |

**EXPLORING TYPES OF PROBLEM STRUCTURES**

Extensive research has been undertaken over the last several decades regarding different problem types. Many of these studies have been published in professional mathematics education publications using different labels and terminology to describe the varied problem types.

A variety of contexts and problem types allow students opportunities to develop an understanding of the meanings of the operations. Encouraging students to use pictures, words and numbers to show their thinking about problems not only provides them a means to refining or clarifying their thinking, it also provides teachers with a window into their level of understanding.

**Task:**

* Model the problem types (Join, Separate, Part-part-whole, and Compare)
* Work alone or with a partner
* Match the numbers in each problem with the components of the problem structure (i.e., which number in each problem is the start, which is the result, which is the change)
* Using the materials at your table, model and solve the problems as a first grader
* Represent the problem you modeled with an addition or subtraction equation

**Sharing and Reflection:**

* Share and compare your work with others
* Rank order the problem types according to the problems from least difficult to most difficult (for primary students)
* Share strategies for promoting a variety of problem types

Task adapted from: Van de Walle, J.A., Karp, K.S., Lovin, L.H. & Bay-Williams, J.M. (2014, pp 129-131). *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades K-2* (2nd ed.). (Vol. II). Pearson Education Inc.