**Standards addressed by these problems: 3.OA.3, 3.OA.4, and 3.OA.5 (addressed by all problem types)**

* **3.OA.7 – if students use a fluent strategy**
* **3.OA.1 – multiplication problem types**
* **3.OA.2 & 3.OA.6 – division problem types**

Overall purpose of these problem types: *To encourage students to use their understanding of multiplication and division and properties of operations to solve multiplication and division problem types.*

***Teacher Note: Problem types are listed as CGI problem type names/CCSS problem situation names***

***\*According to the CCSSM, the goal in this unit is to have students reason about the meaning of multiplication and division. Furthermore, the standards want students to understand the meaning behind each number within the number sentence. For example: see the following three problem type examples.***

|  |  |  |
| --- | --- | --- |
| **Multiplication** | **Measurement Division** | **Partitive Division** |
| Matthew has 3 packages of markers. Each package has 8 markers. How many markers does he have altogether? | Matthew has 24 markers. He puts 8 markers in each package. How many packages will he need for his markers? | Matthew has 24 markers. He puts his markers in 3 packages. How many markers are in each package? |
| **3 x 8 = 24*** **3 represents the number of groups**
* **8 represents the number in each group**
* **The total (24) is unknown**

**Students may write 8 x 3 = 24 for this story. Although this is mathematically correct (based on the commutative property of multiplication) it is imperative that we have discussions in which we discuss what number sentence/equation goes with the story. Students need to understand what each number represents.** | **24 ÷ 8 = 3*** **24 represents the total**
* **8 represents the number in each group**
* **The number of groups (3) is unknown**
 | **24 ÷ 3 = 8*** **24 represents the total**
* **3 represents the number of groups**
* **The number in each group (8) is unknown**
 |

**\*For standard 3.OA.3 the CCSSM states that students will move through three levels (direct modeling, counting, and using algebraic reasoning) in solving multiplication/division problems within 100. Students are not required to memorize these multiplication/division facts within this unit; students just need to have a valid strategy for solving the problems. This means students can use drawings and/or manipulative to solve these problems.** *The teachers’ role is to help students to connect their strategy to a number sentence. As mentioned in the table above, students need to understand the meaning behind each number within the number sentence. Teachers are encouraged to foster a discussion in the classroom that displays the different strategies used by the students in solving the problems (see Mathematical Practices).* **In unit 2, the students are using these authentic experiences in working with multiplication/division problem types to help move toward fluency.****By the end of the year, 3.OA.7 states that students should be fluent multiplying and dividing within 100.**

**Multiplication and Division Word Problems**

**Additional Resource**

Children’s Mathematics – Cognitively Guided Instruction by Carpenter, Fennema, Franke, Levi, Empson

***\*See page 33-53 in for background knowledge on multiplication and division problem types and information on how students solve these types of problems.***

**Multiplication (Grouping/Partitioning) / Unknown Product (Equal Groups)**

* Cassie has \_\_\_\_ boxes of cookies. Each box has \_\_\_\_ cookies. How many cookies does she have altogether?

(4, 5) (5, 4) (10, 4) (10, 5)

* Maria reads for twenty minutes every night. This week she read for \_\_\_\_ days and each day she read \_\_\_\_ pages. How many pages did Maria read altogether?

(5, 3) (3, 5) (3, 4) (3, 3)

* Jacob loves to play basketball. During his last game, he made \_\_\_\_ three pointers. How many points did Jacob score during his last game?

(2) (4) (5) (10)

**Measurement Division (Grouping/Partitioning) / Number of Groups Unknown (Equal Groups)**

* Haylee’s mom was making hair bows for her little sister. Her mom bought \_\_\_ yards of ribbon. She used \_\_\_ yards of ribbon on each bow. How many bows was Haylee’s mom able to make with the ribbon she bought?

(50, 5) (50, 10) (20, 5) (25, 5)

* Corbin had \_\_\_\_ silly bands. Since he had so many he decided to give some away to his friends. He gave each of his friends \_\_\_\_ silly bands. How many of his friends got silly bands?

(12, 4) (16, 4) (20, 4) (20, 5)

* Kelsey is an awesome basketball player. Every time she gets on the basketball court, the crowd cheers. During the first half of the game last night, she already scored a total of \_\_\_\_ points. Each time she made a basket she scored 3 points. How many baskets did Kelsey make during the first half of the game last night?

(12) (15) (30)

**Partitive Division (Grouping/Partitioning)/ Group Size Unknown (Equal Groups)**

* Megan has \_\_\_ cookies that she shares equally with \_\_\_ friends. How many cookies does each friend get?

(6, 2) (6, 3) (8, 2) (8, 4)

* Veronica has \_\_\_ beads that she strings on \_\_\_ necklaces. If she puts the same number of beads on each necklace, how many beads would she use for each necklace?

(12, 3) (12, 4) (16, 4) (20, 4)

* While camping last weekend, Jaxon’s family decided to roast marshmallows over the campfire. They had \_\_\_ marshmallows that they evenly put onto \_\_\_ sticks. How many marshmallows went onto each stick?

(15, 3) (15, 5) (20, 5) (25, 5)