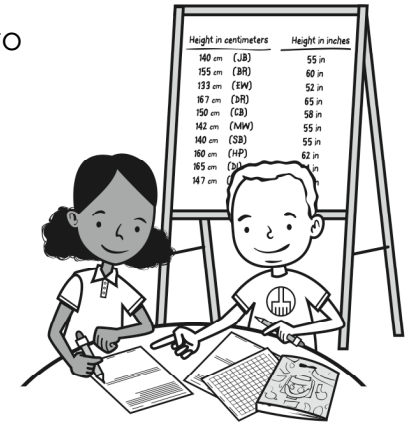
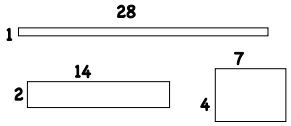
Grade 5, Unit One: Connecting Mathematical Topics

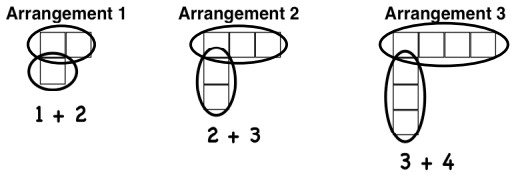
In this unit your child will:

- recall multiplication and division facts through 12's to solve problems
- identify all the factors of a number, write it as a product of prime numbers (prime factorization), and identify it as prime or composite
- apply the standard order of operations to complete a series of calculations
- identify and extend numerical patterns
- read, construct, and interpret graphs
- find the range, mean, mode, and median in data sets



Your child will learn and practice these skills by solving problems like those shown below. Keep this sheet for reference when you're helping with homework.

Problem	Comments
Sketch and label all the rectangles that have an area of 28 square units.  List all the factors of 28.  Is 28 a prime or composite number? Explain how you know. **It is composite because it has more than 2 factors.**	When you multiply the lengths of a rectangle's sides, you get the total area of the rectangle. This makes rectangles a useful way to show ideas related to multiplication. In this example, students sketch all the rectangles (with sides that are whole numbers) that have an area of 28 square units. This shows in picture form all the factors of 28 (a factor is a number that goes into another evenly). A **composite** number, like 28 in this example, has more than two factors. A **prime** number has only two factors: itself and 1. For example, 7 is a prime number because its only factors are 1 and 7. If it is possible to draw only one rectangle with a given area, that number is prime.
Evaluate this expression using the standard order of operations. (3 + 7) ÷ 2 + 3 x 8 – 12 10 ÷ 2 + 3 x 8 – 12 5 + 24 – 12 29 – 12 17	We don't just perform calculations from left to right. The standard order of operations is: 1. Anything in parentheses 2. Multiply or divide from left to right 3. Add or subtract from left to right Students will need to apply the order of operations when studying more advanced mathematics in middle school, high school, and college.

Ramona works in a bakery. She can fit 9 cupcakes in a box. If a customer gets 18 vanilla cupcakes and 24 chocolate cupcakes, how many boxes will Ramona use? **18 + 24 = 42 cupcakes** **42 ÷ 9 = 4 r6** **36 cupcakes fit in 4 boxes but Ramona still needs a box for the 6 cupcakes that are left. So she needs 5 boxes.**	Problems like this one require students to recall their basic facts and make sense of their calculations in the context of the story problem. It is important for students not only to master the facts, but also to apply them when solving story problems with multiple steps and remainders.
 How many tile would it take to build the 20th arrangement in this sequence? Show all your work. **It's always the arrangement number plus 1 more than the arrangement number. I showed that on the picture. For the 20th one, it's 20 + 21. That's 41 tile.** Write an expression to show how many tile it would take to build the *n*th arrangement. **n + (n + 1)**	To figure out how many tile are in the 20th arrangement, students must find a relationship between the arrangement number and the number of tile. There are many ways to think about that relationship, but only one correct number of tile in the 20th arrangement. The second part of this problem invites students to express the relationship between the arrangement number (*n*) and the number of tile using algebraic notation. In this example, the student used the notation to show the relationship he described in the first part of the problem. You might also see that the expression could be written in simplest form as $2n + 1$. A student who sees two groups of tile equal to the arrangement number plus 1 more might express that relationship symbolically as $2n + 1$.

Frequently Asked Questions about Unit One

Q: What is the connection between the different topics in this unit?
A: We start the year by addressing a variety of topics—including multiplication, division, data analysis, and algebraic thinking—in order to emphasize the connections between them. We also want students to think about the process of mathematical thinking, which involves observation, description, conjecture, experimentation, and generalization. These ways of thinking can be applied to all topics in mathematics. The other units this year address fewer topics at a time to help build discrete skills, while also continuing to make the connections between topics explicit.

Q: Some of these problems look similar to what my child did in fourth grade. What's new and how will my child be challenged in this unit?
A: The instruction in this unit picks up where fourth grade left off and takes each topic to a new level. For example, students identified factors of numbers in fourth grade: in this unit they also learn to find the prime factorization of a number (that number expressed as the product of only prime numbers). They analyzed patterns last year, and this year they use algebraic notation to represent those patterns. You'll also see challenge problems integrated into nearly all of the homework assignments.