Grade 4

Solving Complex Problems

Overarching Student Learning Goals In this unit, your child will work to build an understanding of the following:	Resources/Tasks to support your child at home.
Solve multi-step problems involving all four operations • Students use their experiences with addition, subtraction, multiplication, and/or division to solve multi-step problems • Example: ○ *The fourth and fifth grades are going on a field trip to the Holiday Show at the War Memorial Opera House. There are 240 students, 8 teachers and 14 parents riding on school buses to the show. The school ordered 6 buses to take everyone to the show. How many people will need to go on each bus if they are divided up equally? Show how you know.* ○ *When the 6 buses arrive, they find out that only 40 people fit on each bus. The rest will have to go the Holiday Show in cars. If each car holds 4 passengers, how many cars will they need? Show how you know.*	• Florida Student Tutorials: Field Trip Frenzy: ○ Part 1 - https://bit.ly/2IdmlZI ○ Part 2 - https://bit.ly/2G5JlGs ○ Part 3 - https://bit.ly/2U9rx25 ○ Part 4 - https://bit.ly/2Kpa0TT • Khan Academy: Represent Multi-Step Word Problems Using Equation - https://bit.ly/2GgViJB • Khan Academy: Solving Multi-Step Word Problems - https://bit.ly/2X4Paeb
Interpret a remainder (in problems involving division w/ remainders) • A remainder is the part left over after two numbers have been divided if they don't divide evenly. Students need to think about what a question is asking before they decide what a remainder might mean. Here are some examples that show how important the context is, with each situation involving 60 divided by 40. 60 ÷ 40 = 1 with 20 left over. What happens to the 20 that are left? • Examples: ○ *The after school soccer team is taking a bus to their game. Each bus seats 40 students, and 60 students will attend. How many buses are needed?* ○ *The after school soccer team has t-shirts with the school logo. There are 40 students sharing 60 t-shirts. How many t-shirts will each student get?* ○ *After the game, the players eat a snack. There are 60 apples for the 40 players. How many apples will each player get?*	• Khan Academy: Intro to Remainders - https://bit.ly/2IoY6qt • Khan Academy: Understanding Remainders - https://bit.ly/2VBY6r0 • Khan Academy: Interpreting Remainders - https://bit.ly/2KtNvgG

Grade 4

Extend and describe number and shape patterns

- Patterns that grow in a predictable way over a number of steps are called **growth patterns**. We could say that each new figure in this pattern has one additional square on each arm, or that each new figure has four more squares in all. We could also use math terminology to describe the growth using words like "plus four more at each new step."

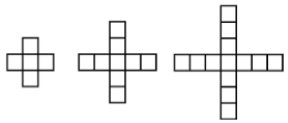
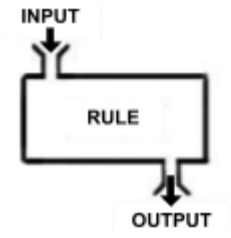


Figure number	Number of squares
1	5
2	9
3	13
4	?
?	?

- A **function** is a special relationship between pairs of numbers. A **number machine** is a way to introduce rules that converts the starting number, or **input**, into the resulting number, or **output**. We can see that each output here is twice as great as the input, so we can say that the rule here is "multiply by two."



Rule: x 2	
Input	Output
1	2
2	4
3	6
4	8
?	?

- LearnZillion: Find the Rule for a Function Machine using a Table - https://bit.ly/2HzGOb7
- Khan Academy: Math Patterns with Tables - https://bit.ly/2VBy8nx
- Khan Academy: Math Patterns with Toothpicks - https://bit.ly/2P6z8xC

Use comparative relational thinking with equations

- Comparative relational thinking calls for students to analyze the relationship of values on both sides of the equal sign, rather than using an operation to solve for the exact value
- For example: Is the equation 3 + 5 = 4 + 6 true? *Without solving, I know it cannot be true because 4 is greater than 3 and 6 is greater than 5 so the value on the right must be greater than the value on the left.*
- Students apply this thinking to determine the value of an unknown as well. Ex: 12 + 18 = 20 + *n*, what is the value of *n*? There are multiple ways to solve this, but a student may think "If I take the 2 from 12, and 18 plus 2 more is equal to 20, then I know there is still 10 more left from the 12. So *n* must be worth 10.

- Comparative Relational Thinking PowerPoints:
  - Addition - https://bit.ly/2P1imje
  - Subtraction - https://bit.ly/2Kr298B
  - Multiplication - https://bit.ly/2D71H9b