Patterning and Algebra

Activity 10 Assessment

Consolidating Variables and Equations

Variables and Equations			
Evaluates a numerical expression using the order of operations $2 \times (30 + 18) - 3 = 2 \times 48 - 3$ $= 96 - 3$ $= 93$ "I have to do the operation in brackets first, then the multiplication, and then the subtraction."	Writes an algebraic expression to describe an unknown value Subtract five from a number, then multiply by two $(n - 5) \times 2$ "I let n represent the number. I used brackets so 5 would be subtracted first."	Evaluates an algebraic expression using substitution $(n - 5) \times 2$ "To find the value of the expression when n equals 12, I substitute 12 for n." $(n - 5) \times 2 = (12 - 5) \times 2$ $= 7 \times 2$ $= 14$	Solves equations involving one operation using different strategies $23 = e + 15$ $23 - 15 = e + 15 - 15$ $8 = e$ "I used the inverse operation, subtracting 15 from each side."
Observations/Documentation			

Activity 10 Assessment
Consolidating Variables and Equations

Variables and Equations (cont'd)

Solves equations involving two operations using different strategies	Verifies the solution to an equation	Solves problems using equations involving one or two operations	Flexibly works with equations to solve problems using a variety of strategies
$29 = 3z + 2$ $29 - 2 = 3z + 2 - 2$ $27 = 3z$ $\frac{27}{3} = \frac{3z}{3}$ $9 = z$ "I performed the order of operations in the reverse order to isolate the variable. I subtracted 2 from each side, then divided each side by 3."	$29 = 3z + 2$ "To verify, substitute $z = 9$. Left side = 29 Right side = $3(9) + 2$ $= 27 + 2$ $= 29$ Since the left side equals the right side, my solution is correct."	Kairis sold 16 tickets. That is twice as many tickets as Grace sold. How many tickets did Grace sell? Let t represent the number of tickets Grace sold. $2t = 16$ $\frac{2t}{2} = \frac{16}{2}$ $t = 8$ "So, Grace sold 8 tickets."	At the grocery store, there are 5 lines of people at the checkouts. There are the same number of people in each line. The manager counts to determine the total number of people at the checkouts, including 6 employees (including the manager). They counted 51 people. How many people are in each line? Let n represent the number of people in each line. $5n + 6 = 51$ $5n + 6 - 6 = 51 - 6$ $5n = 45$ $n = 9$ "I know $5 \times 9 = 45$, so $n = 9$. There are 9 people in each line."

Observations/Documentation

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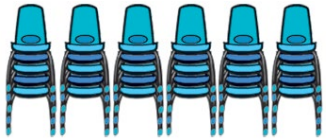
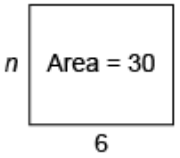
Using Variables to Represent a Problem as an Equation			
Interprets word problems/pictures and identifies the unknown part Our class needs to set up rows of 6 chairs for a presentation. There are 30 chairs altogether. How many rows do we need?  "The unknown is the number of rows of 6 chairs needed to make an array of 30 chairs."	Translates word problems into equations using variables, operations, and numbers  "The unknown, n, is the number of rows. I know there are 6 chairs in each row and a total of 30 chairs. So, $6n = 30$."	Describes equivalent relationships using more than one equation (including formulas)  "I know the area of a rectangle is base multiplied by height, which is 30. If the base is 6, then the height must be n. I could write the equation $30 = 6n$ or $30 \div 6 = n$."	Flexibly writes algebraic equations using a variety of strategies $6n = 30$ $30 \div n = 6$ "I can use the inverse operation to rewrite the equation."
Observations/Documentation			