

Unit 10 – Patterns

Study Guide

Vocabulary

Literacy Link

In algebra, $5 \times r$ is written as $5r$.
It is read as “five r .”

relationship

- a pattern formed by two sets of numbers

variable

- a letter that represents an unknown number
- for example, x , A , n

expression

- any single number or variable, or a combination of operations ($+$, $-$, $\times$, $\div$) involving numbers and variables
- for example, 5 , r , $8t$, $x + 9$, $2y - 7$

value

- a known or calculated amount

constant

- a number that does not change
- increases or decreases the value of an expression

numerical coefficient

- a number that multiplies the variable

Literacy Link

Choosing Variables

You can choose any letter as a variable. It can be helpful to choose a meaningful variable. For example, C for cost, d for distance, and t for time.

10.1

Key Ideas

- Patterns come in many forms, including numbers and shapes.
- You can use a pattern to predict what comes next.
- To describe a pattern, say how to get the next item.
- You can write repeating decimal numbers as fractions.

10.2

Key Ideas

- An expression gives you a simple, quick way to describe a pattern.

$3f$ $n + 1$

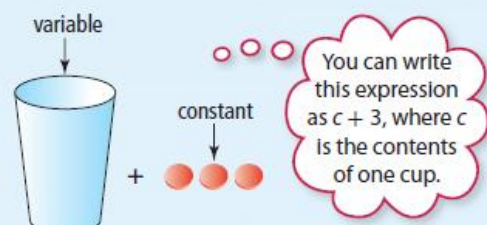
numerical coefficient variables constant

- Any letter can be used as a variable to represent a number or amount.
- To write a pattern as an expression,
 - choose a variable and tell what it represents
 - describe the pattern using the variable, numbers, and operations

10.3

Key Ideas

- You can model expressions using cups and counters.
- Evaluate an expression by substituting a number for the variable in the expression.
- You can make a table of values for an expression.



10.4

Key Ideas

- Patterns can be shown by listing ordered pairs in a table of values or by plotting the ordered pairs on a graph.

x	0	1	2	3	4
y	0	1	2	3	4

- Patterns can be described in several ways:

Words

The pattern forms a straight line, starting at $(0, 0)$.
Each y -coordinate is the same as its x -coordinate.

Horizontal and Vertical Distances

The points increase by 1 unit to the right, then
1 unit up, starting at $(0, 0)$.

Relationship

The coordinates of the points are (x, y) .

The relationship is linear and can be expressed as (x, x) or $y = x$.

- You can use patterns in graphs to solve problems.

