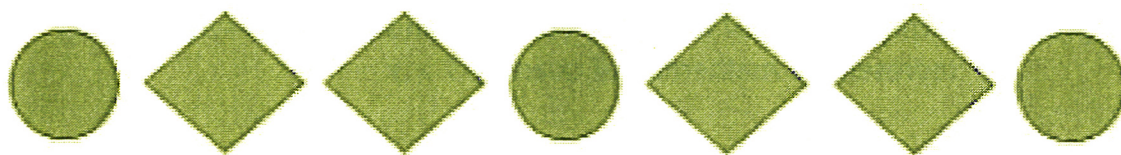# Chapter 7

Patterns and Sequences

5, 9, 13, 17, 21, 25

Study Buddy

Dear Family,

Today my class started the **Patterns and Sequences** chapter. I will be learning to recognize both numeric and nonnumeric patterns. I will also use rules to solve addition, subtraction, multiplication, and division equations. Here are my vocabulary words that I will be using during my lessons.

Love, _____

p.s. Look on the back of this letter to find some quick practice tips that we can do together in the car, along with an activity and books for us to read at home.

Vocabulary

expression: a combination of numbers, variables, and operation symbols that represents a mathematical quantity $3 \times y$

variable: a letter or symbol used to represent an unknown quantity
In $3 \times y = 27$, y is the variable.

parentheses: tells you which operation to perform first
$12 - (7 + 2)$

equation: a mathematical sentence that contains an equals sign, $=$, indicating that the left side of the equals sign has the same value as the right side
$4 + 5 = 9$

pattern: a sequence of numbers, figures, or symbols that follows a rule or design
2, 4, 6, 8

sequence: the ordered arrangement of terms that make up a pattern

term: a number in a pattern or sequence

Important Vocabulary **Test Words**

Nonnumeric Pattern – A pattern that does not have numbers and often uses shapes or symbols

Numeric Pattern – A pattern that uses numbers

Pattern – A sequence of numbers, figures, or symbols that follows a rule or design.

 Ex: 2, 4, 6, 8

Rule – A statement that describes a relationship between numbers or objects.

Sequence – An ordered arrangement of terms that make up a pattern

Term – A number in a pattern or sequence

MATH at HOME

At Home Activity

Place 2 plates next to each other. Think of each plate as one side of an equation.

- Place 1 dime on each plate.
- Add 2 nickels to the left plate.
- Place 1 dime on the right plate.
- Are the values on each plate equal?
- Remove a dime from each plate.
- What are the new values? Are they equal?
- What must you do to the left side so the two sides are equal?

Travel Talk

Look at the car next to your car. How many people would you need to add or subtract to your car to make them have the same number of people? How many people would you have if you multiplied the amount of people in both cars together?

Books to Read

Subtraction Action
by Loreen Leedy

How Many Feet? How Many Tails?
by Marilyn Buns

Mission Addition
by Loreen Leedy

Alice in Pastaland
by Alexandra Wright
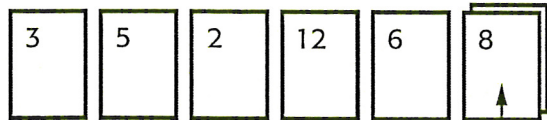
Name _____ Date _____

Game Time

Goal: An Equation Game!

Ready

You will need:
48 index cards
paper and pencil
2 or more players

| 3 | 5 | 2 | 12 | 6 | 8 |

Goal number

Set

Write 1 number on each card as shown at the right. Make 4 sets of each card.

| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |

Shuffle the cards and lay the first 5 cards face up in a row. Lay the rest of the cards at the end of the row in a pile.

Go!

1. Turn the top card on the pile face up. This is the "Goal" card. Each player tries to make the goal number by using any combination of the 5 cards in the row. You can add, subtract, multiply, or divide to reach the goal number. You may use all the cards or just two, but no card may be used twice.

2. When a player comes up with an equation, the player slaps the goal card and says, "Goal!" The player then explains the equation. For example, above a player can explain $3 + 5 = 8$, $12 - 6 + 2 = 8$, or $12 \times 3 \div 6 + 2 = 8$.

3. If the player is correct, he or she keeps the cards that were used in the equation. If the player is incorrect, the other player keeps the cards used in the equation. The other cards are placed at the bottom of the pile.

4. Play continues until all cards are used. When all cards are used, the players add up all the values of their cards. The player with the highest total is the winner.
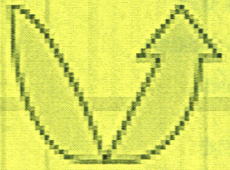
INPUT-OUTPUT TABLES
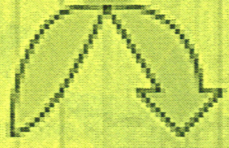
What goes in

What comes out

Input	Output
2	6
4	8
7	11
10	14
12	16

Rule: + 4

What you do to the input

Input

the first number in a table that
you apply a math rule to

example: Input=2 (rule x3 + 1) Output =7

Output

the second number in a table that has
the math rule applied to it

example: Input=2 (rule x3 + 1) Output =7

Input W	1	2	3	4	5	6	10
Output X	0	1	2	3	4	5	9

Rule: Subtract 1

Equation: $W - 1 = X$

$$10 - 1 = \boxed{9}$$

Order of Operations

To solve math problems with more than one operation ($+$, $-$, $\times$, $\div$), remember this sentence for the correct order:

PLEASE EXCUSE MY DEAR AUNT SALLY

PLEASE =	**Parentheses** (or different grouping symbols)
EXCUSE =	**Exponents**
MY DEAR =	**Multiply** and/or **Divide**
AUNT SALLY =	**Add** and/or **Subtract**

Do each operation from left to right.

$$(6-3)+(2\times3)^2\times4+(3+1)$$
$$3 \quad + \quad 6^2 \quad \times 4 + \quad 4 \qquad \text{First, do what's in Parentheses}$$
$$3 \quad + \quad 36 \quad \times 4 + \quad 4 \qquad \text{Then, do the Exponents}$$
$$3 \quad + \quad 144 \quad + \quad 4 \qquad \text{Next, Multiply and/or Divide}$$
$$= 151 \qquad \text{Last, Add and/or Subtract}$$

Continue working the problem to complete all operations.