Pearson

Explorations in Mathematics

Semester A Summary:

This is the first of two courses that comprise Explorations in Mathematics. This course is designed to provide the student with a solid mathematics foundation. The student will explore properties of rational numbers including divisibility patterns, prime factorization, greatest common factor, and least common multiple. The student will add, subtract, multiply, and divide rational numbers. Then, the student will identify and solve expressions and equations using variables. Finally, the student will use properties, including the Associative Property, Commutative Property, and Distributive Property, to solve and simplify equations.

Semester A Outline

1. **Working with Rational Numbers**
    1. Divisibility Patterns
        - Learn what divisible means
        - Understand how to determine whether or not a number is divisible
        - Practice using divisibility patterns
    2. Divisibility Patterns Activity
    3. Prime Factorization
        - Identify the prime numbers and composite numbers
        - Examine factor trees
        - Learn to do the prime factorization of a number using repeated division
    4. Prime Factorization Activity
    5. Greatest Common Factor
        - Understand what common factors are
        - Learn how to determine the Greatest Common Factor of two or more whole numbers
        - Practice finding the Greatest Common Factor of two whole numbers
    6. Greatest Common Factor Activity
    7. Rational Numbers and Reducing
        - Learn to recognize rational numbers
        - Rewrite rational numbers as the ratio of two integers
        - Understand how to simplify the ratio of two integers when necessary
    8. Rational Numbers and Reducing Activity
    9. Add/Subtract Rationals with Like Denominators
        - Learn to add and subtract rational numbers with like denominators
        - Understand what a remainder is
        - Examine how to reduce an improper fraction to its simplest form
    10. Add/Subtract Rationals with Like Denominators Activity
    11. Least Common Multiple
        - Understand what the least common multiple of two numbers is
        - Practice finding the least common multiple of two numbers

- Review what common factors are and how to find the greatest common factor

12. Least Common Multiple Activity
13. Add/Subtract Rationals with Unlike Denominators
    - Add and subtract rational numbers with unlike denominators
    - Learn to add and subtract with improper fractions
    - Understand how to add and subtract with mixed fractions
14. Add/Subtract Rationals with Unlike Denom. Activity
15. More Subtracting Rationals with Unlike Denominator
    - Learn how to subtract rational numbers with unlike denominators by rewriting one or both of the rational numbers
    - Understand how to reduce to the simplest form
16. More Subtracting Rationals Activity
17. Multiplying Rational Numbers
    - Understand how to multiply rational numbers
    - Learn to write rational numbers in simplest form
18. Multiplying Rational Numbers Activity
19. Dividing Rational Numbers
    - Learn to divide rational numbers
    - Understand how to write the quotient in simplest form
20. Dividing Rational Numbers Activity

2. **Variables, Equations, and Properties**
    1. Variables, Expressions, and Equations
        - Recognize variables, expressions, and equations
        - Understand how to use variables, expressions, and equations
    2. Variables, Expressions, and Equations Activity
    3. Associative Property of Addition/Multiplication
        - Identify the Associative Property of Addition and Multiplication
        - Learn how to use Associative Property to solve your mathematical equations
        - Understand the advantages to using Associative Property
    4. Associative Prop. of Multiplication/Addition Activity
    5. Commutative Property of Addition/Multiplication
        - Identify the Commutative Property of Addition and Multiplication
        - Learn to use the Commutative Property of Addition and Multiplication
        - Understand why you would use the Commutative Property of Addition and Multiplication
    6. Commutative Prop. of Addition/Multiplication Activity
    7. Order of Operations
        - Understand the order of operations
        - Use the order of operations to evaluate an expression
        - Look at bases and exponents
    8. Order of Operations Activity
    9. Additive and Multiplicative Identity Property
        - Identify the Additive Identity Property
        - Use the Additive Identity Property
        - Learn what the Multiplicative Identity Property is
        - Practice using the Multiplicative Identity Property
    10. Additive/Multiplicative Identity Property Activity
    11. Additive Inverse Property
        - Identify additive inverse
        - Practice using the additive inverse
    12. Additive Inverse Property Activity

13. Multiplicative Inverse Property
    - Understand what multiplicative inverse is
    - Practice using the multiplicative inverse
14. Multiplicative Inverse Property Activity
15. Distributive Property
    - Learn what the Distributive Property is
    - Understand how to use the Distributive Property to evaluate an expression
16. Distributive Property Activity
17. Using the Distributive Property
    - Learn what the Distributive Property is
    - Use the Distributive Property to collect like terms in an expression
18. Using the Distributive Property Activity
19. Using Properties to Simplify Expressions
    - Review the properties studied in this unit
    - Determine the properties used to simplify an expression
20. Using Properties to Simplify Expressions Activity

3. **Explorations of Mathematics A Final**
    1. Explorations of Mathematics A Final Review
    2. Explorations of Mathematics A Final

Semester B Summary:

This is the second of two courses that comprise Explorations in Mathematics. This course is designed to provide the student with a solid mathematics foundation. The student will be introduced to the properties of equality to solve one-step and multi-step equations. Then, the student will explore absolute value and how to compare values using absolute value. The student will examine the applications of one-step and multiple step equations. Finally, the student will be introduced to probability and statistics concepts including direct and inverse variation, mean, median, mode, counting principle, permutations, and combinations.

Semester B Outline

1. **Integers and Solving Equations**
    1. Addition and Subtraction Property of Equality
        - Learn how to use the Addition and Subtraction Property of Equality
        - Practice solving simple equations using the Addition and Subtraction Property of Equality
    2. Addition/Subtraction Property of Equality Activity
    3. Multiplication and Division Property of Equality
        - Use the Multiplication and Division Property of Equality to solve simple equations
        - Understand the importance of using the Multiplication and Division Property of Equality
    4. Multiplication/Division Prop. of Equality Activity
    5. Integers: Absolute Value and Comparison
        - Understand what the absolute value of an integer is
        - Compare two or more integers
    6. Integers: Absolute Value and Comparison Activity
    7. Adding and Subtracting Integers
        - Learn to add and subtract integers
        - Practice adding and subtracting integers
    8. Adding and Subtracting Integers Activity

9. Multiplying and Dividing Integers
    - Learn to multiply integers
    - Understand how to divide integers
    - Practice multiplying and dividing integers
10. Multiplying and Dividing Integers Activity
11. Reflexive, Symmetric, Transitive, and Substitution
    - Learn how to use the reflexive, symmetric, transitive, and substitution property of equality to solve simple equations
    - Practice using the reflexive, symmetric, transitive, and substitution property of equality to solve simple equations
12. Reflexive/Symmetric/Transitive/Substitution Activity
13. Solving One-Step Equations
    - Use the Addition, Subtraction, Multiplication, or Division Property of Equality to solve one-step equations
14. Solving One-Step Equations Activity
15. Applications of One-Step Equations
    - Learn the applications of one-step equations
    - Use one-step equations to solve application problems
16. Applications of One-Step Equations Activity
17. Solving Multiple-Step Equations
    - Learn how to solve multi-step equations
    - Practice solving multiple-step equations
18. Solving Multiple-Step Equations Activity
19. Applications of Multiple-Step Equations
20. Applications of Multiple-Step Equations Activity

2. **Probability and Statistics**
    1. Direct Variation
        - Understand constant of variation
        - Use constant of variation to solve problems involving direct variation
    2. Direct Variation Activity
    3. Inverse Variation
        - Discover what inverse variation means
        - Use inverse variation to solve equations
    4. Inverse Variation Activity
    5. Mean and Mode
        - Learn the definitions of the mean and mode of a data set
        - Find the mean and mode of a data set
    6. Mean and Mode Activity
    7. Median and Quartiles
        - Discover the median of a set of ordered data
        - Understand what the quartiles are
    8. Median and Quartiles Activity
    9. Box and Whisker Plots
        - Learn what box-and-whisker plots are
        - Draw the box-and-whisker plot of a data set
    10. Box and Whisker Plots Activity
    11. Counting Principle
        - Understand what the counting principle is
        - Find the total number of possible outcomes in multiple events
    12. Counting Principle Activity
    13. Permutations
        - Gain an understanding of permutations

- Find the total number of permutations of n objects
- Look at the factorial of a number

14. Permutations Activity
15. Combinations
    - Learn the meaning of combinations
    - Find the number of combinations of list of objects
16. Combinations Activity
17. Probability
    - Understand how to find the probability of simple events
    - Practice finding the probability of simple events
18. Probability Activity
19. Application of Probability
    - Use the counting principle to calculate probability
    - Work with permutations to calculate probability
    - Look at combinations used to calculate probability
20. Application of Probability Activity

3. **Explorations in Mathematics B Final**
    1. Explorations in Mathematics B Final Review
    2. Explorations in Mathematics B Final

