

# Mathematics

## Grade 6

### **Use alternative forms of expressing rational numbers**

#### Initial Understanding

Rename equivalent fractions and mixed numbers.

Rename equivalent fractions and mixed numbers as equivalent decimals, and vice versa

#### Developing an Interpretation

Identify alternative forms of expressing whole numbers  $< 100,000$  using expanded notation and regrouping

#### Making Connections

Solve problems involving 100, 1000, 10,000 more or less and 0.1 more or less than a number

### **Use Integers, decimals and fractions to; determine magnitude, compare, order, picture and round**

#### Initial Understanding

Locate points on number lines and scales, including fractions decimals and integers.

Construct pictorial representations of decimals (tenths & hundredths) and mixed numbers

Construct fractions mixed number's, decimals percents to their pictorial representations and vice versa

#### Developing an Interpretation

Order and describe the magnitude of whole numbers and decimals (tenths and hundredths)

Order fractions and mixed number

Describe the magnitude of whole numbers and decimals (tenths and hundredths)

Describe the magnitude of fractions and mixed numbers.

#### Making Connections

Round whole numbers and fractions and decimals in a context

### **Develop estimation strategies**

#### Developing an Interpretation

Identify the best expression. To find an estimate.

Identify whether and why a particular strategy will result in an overestimate or an underestimate.

Identify the best expression to find an estimate

Estimate length, areas and angle measurement

Identify whether and why a particular strategy will result in an overestimate or an underestimate

#### Making Connections

Estimate length, areas and angle measurement

Determine a reasonable estimate and describe the strategy used to make the estimate.

#### Critical Stance

Estimate a reasonable answer to a problem and make and defend decision

### **Use strategies, to add and subtract, multiply, and divide rational numbers.**

#### Initial Understanding

Add and subtract fractions and mixed numbers with reasonable and appropriate denominators

Multiply whole numbers and fractions by fractions and mixed numbers.

Add and subtract 2-, 3-, and 4- digit whole and decimals

Multiply and divide whole numbers by 10, 100 and 1000.

Multiply and divide 2- and 3- digit whole numbers and money amounts by 1- digit numbers and decimals.

#### Developing an Interpretation

Identify the correct placement of the decimal point in multiplication, and division of decimals by one digit numbers.

Identify or write the appropriate operation or # sentence to solve a story problem

### Making Connections

- Solve 1-step problems involving fraction decimals and money
- Solve 2-step problems involving whole number's fractions, decimals mix number's, including averaging
- Solve 2-step problems involving whole numbers, decimal fractions and mixed numbers, with extraneous information.
- Solve 2-step problems and explain how the solution was determined.
- Write story problems from equations involving fractions and decimals.
- Solve problems involving ratios
- Solve extended numerical problems

### **Develop Algebraic Concepts**

#### Initial Understanding

- Solve 1-step algebraic equations
- Evaluate expression and use formulas

#### Developing an Interpretation

- Identify or state rules for given pattern

#### Making Connections

- Extend or complete patterns involving whole number's and attributes,

#### Critical Stance

- State and defend the rule or equation for patterns involving whole numbers. And attributes

### **Use Elementary Statistics and Probability to analyze Data**

#### Initial Understanding

- Create bar and line graphs from data in tables and charts

#### Developing an Interpretation

- Identify correct information from graphs, tables, and charts

#### Making Connections

- Solve extended statistical problems
- Solve problems involving elementary notions of probability. and fairness, include justifying answers
- Draw and justify reasonable conclusions from graphs, tables, and charts
- Solve problems involving means and medians of set of data
- Solve problems involving organization of data including sorting objects by common attributes

### **Apply time, measure length, find area and volume**

#### Initial Understanding

- Measure or determine perimeter and area, volume

#### Developing an Interpretation

- Identify appropriate customary or metric units of measure for a given situation

#### Making Connections

- Solve problems involving the conversion of units of measures including time

### **Develop spatial relationships in Plane Geometry**

#### Initial Understanding

- Draw geometric shapes and figures
- Describe and classify geometric shapes and figures

#### Developing an Interpretation

- Identify and draw lines of symmetry
- Identify geometric transformations
- Identify congruent & similar figures
- Identify points on a grid

#### Making Connections

- Solve extended spatial problems

### Critical Stance

In Mathematics justifying, proving or explaining a conjecture or answer is connected to the learning environment. Students are encouraged and expected to question one another's ideas and to explain and support their own ideas in the face of others' challenges. Each objective in mathematics can be framed to have students defend, support, explain or prove their answer. Educational research offers compelling evidence that students learn mathematics well only when they construct their own mathematical understandings. To understand what they learn, students must enact for themselves verbs that permeate the mathematics curriculum: "examine", "represent", "transform", "solve", "apply", "prove".

# Mathematics

## GRADE 6 EXPAND CORE

Develop number and number relationships with integers, rational and irrational numbers

Use computation and estimation strategies with rational numbers and integers

Use strategies, to solve problems with numbers and variables

Develop Algebraic Concepts

Use Elementary Statistics and Probability to analyze Data

Explore Geometry and measurement in two and three dimensions

# Mathematics

## GRADE 6 EXPANDED CORE

### **Develop number and number relationships with integers, rational and irrational numbers**

#### Initial Understanding

Order whole number's, and decimals.

Round whole numbers decimals.

#### Developing an Interpretation

Identify alternative forms of expressing #'s expanded notation.

Identify alternative forms of expressing #'s, using scientific notation

Relate fractions, decimals, and percents to pictorial presentations & vice versa.

Construct pictorial representations of fractions, decimals, and percents

Rename equivalent fractions & mixed #'s as equivalent decimals & vice versa.

Rename fractions & decimals as equivalent percents & vice versa or state rules for given pattern

Order fractions mixed numbers

Describe magnitude of whole #'s and decimal

Describe magnitude of fractions or mixed number's

Round whole numbers, fractions and decimals in context

#### Making Connections

Describe magnitude whole numbers in context.

Locate points on # lines/scales, including fractions, decimals, & integers.

### **Use computation and estimation strategies with rational numbers and integers**

#### Initial Understanding

Add and -Subtract 2, 3, 4-digit whole #'s, & decimals

Multiply & Divide whole #'s, decimal [10, 100 1000].

Multiply & divide 2, 3-digit whole. #'S, \$, decimal. By 1 digit #'s, & decimal

Add & subtract fraction, mixed #'s with reasonable and appropriate denominators.

#### Developing an Interpretation

Identify best expression to find estimate

Find percents of whole #'s or

Identify whether & why a particular strategy will result in over or underestimate

Find percents of whole #'s or the percent a given # is of another #.

#### Making Connections

Estimate a reasonable answer to a problem

Multiply whole #'s & fractions by fractions and mixed numbers.

Solve 1-step problems involving fractions and mixed #'s.

Solve multi-step problems: whole #'s, decimals, fractions, and mixed #'s including averaging.

Solve problems involving whole #'s, decimal, fractions, mixed #'s with extraneous. Information

Solve multi-step problems; justify solutions.

Solve problems involving ratios

Solve problems involving proportions

Solve problems involving percent

#### Critical Stance

Explain and defend why estimate is or is not reasonable.

Estimate to make or defend a decision.

## **Use strategies, to solve problems with numbers and variables**

### Developing an Interpretation

Identify appropriate operations or # sentences to solve story problems.

### Making Connections

Solve 1-step probe: whole, #'S, decimals, \$.

Solve multi-step problems; justify solution.

Solve multi-step problems involving whole numbers

Solve problems involving: 0.1/0.01 .001 more/less.

Write story problems from equations involving rational numbers, integers and variables

Solve extend numerical problems

## **Develop Algebraic Concepts**

### Initial Understanding

Solve simple 1 -step equations.

Use order of operations

Evaluate expressions & use formulas.

### Developing an Interpretation

Write expressions to represent a given situation.

Identify or extend patterns involving #'s and attributes

Identify or state rules for given patterns, write the formula

Identify points on grids.

### Making Connections

Represent situations with algebra expression.

## **Use Elementary Statistics and Probability to analyze Data**

### Initial Understanding

Organize data.

Create graphs from data: tables and charts.

### Developing an Interpretation

Identify correct information: graphs, tables, and charts.

### Making Connections

Draw reasonable conclusions from graphs, tables, and charts.

Solve problems involving means and medians of sets of data.

Solve extend and statistical problems

Solve problems. Involving organization of data.

Solve problems involving elementary notions of probability, fairness, including justifying answers

Solve problems involving expected outcomes or predictions.

### Critical Stance

Justify reasonable conclusions from graphs, tables, and charts.

## **Explore Geometry and measurement in two and three dimensions**

### Initial Understanding

Draw geometry shapes and figures.

Describe, model, and classify shapes.

Measure and determine perimeter, area, and volume.

### Developing an Interpretation

Estimate lengths, area, and angle measurement.

Identify or draw geometry transformations.

Identify draw and describe lines of symmetry.

Identify appropriate customary or metric measure for a given situation.

Relate 2-dimensional and 3-dimensional. Representations

Identify or describe congruent and similar figures.

Identify points on grids.

### Making Connections

Solve problems involving conversions of units of measure, including time.

Solve extend spatial problems

### Critical Stance

In Mathematics justifying, proving or explaining a conjecture or answer is connected to the learning environment. Students are encouraged and expected to question one another's ideas and to explain and support their own ideas in the face of others' challenges. Each objective in mathematics can be framed to have students defend, support, explain or prove their answer. Educational research offers compelling evidence that students learn mathematics well only when they construct their own mathematical understandings. To understand what they learn, students must enact for themselves verbs that permeate the mathematics curriculum: "examine", "represent", "transform", "solve", "apply", "prove".