

## Catholic Identity Standards

### 7.0 The student understands and integrates the content of what is learned into their faith and daily life.

- 7.0A recognize that every human life is sacred because each person is created and loved by God
- 7.0B describe ways to take part in/be responsible to the community by discerning and using our God-given gifts
- 7.0C recognize and oppose unjust social structures and work toward justice for all
- 7.0D see God at work in all things and as expressed in the sacraments
- 7.0E connect scripture, tradition, and the models of Mary and the saints to guide, grow, and deepen faith

## Mathematical Process Standards

### 7.1 The student uses mathematical processes to acquire and demonstrate mathematical understanding.

- 7.1A apply mathematics to problems arising in everyday life, society, and the workplace
- 7.1B use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution
- 7.1C select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems
- 7.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
- 7.1E create and use representations to organize, record, and communicate mathematical ideas
- 7.1F analyze mathematical relationships to connect and communicate mathematical ideas
- 7.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication
- 7.GS1\* demonstrate the mental habits of precise, determined, careful, and accurate questioning, inquiry, and reasoning in the pursuit of transcendent truths
- 7.GS2\* develop lines of inquiry to understand why things are true and why they are false
- 7.GS3\* have faith in the glory and dignity of human reason as both a gift from God and a reflection of Him in whose image and likeness we are made
- 7.GS4\* explain how mathematics in its reflection of the good, true, and beautiful reveals qualities of being and the presence of God
- 7.DS8\* exhibit humility at knowing that as a human being man can only grasp a portion of the truths of the universe
- 7.DS9\* advance an understanding of the ability of the human intellect to know and the desire of the will to want to know more

## Number and Operations

### 7.2 The student applies mathematical process standards to represent and use rational numbers in a variety of forms.

- 7.2A extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers

## Number and Operations

### 7.3 The student applies mathematical process standards to add, subtract, multiply, and divide while solving problems and justifying solutions.

- 7.DS5\* Exhibit habits of thinking quantitatively and in an orderly manner, especially through immersion in mathematical observations found within creation
- 7.3A add, subtract, multiply, and divide rational numbers fluently
- 7.3B apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers

## Proportionality

### 7.4 The student applies mathematical process standards to represent and solve problems involving proportional relationships.

- 7.4A represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including  $d = rt$
- 7.4B calculate unit rates from rates in mathematical and real-world problems
- 7.4C determine the constant of proportionality ( $k = y/x$ ) within mathematical and real-world problems
- 7.4D solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems
- 7.4E convert between measurement systems, including the use of proportions and the use of unit rates

## Proportionality

### 7.5 The student applies mathematical process standards to use geometry to describe or solve problems involving proportional relationships.

- 7.5A generalize the critical attributes of similarity, including ratios within and between similar shapes
- 7.5B describe  $\pi$  as the ratio of the circumference of a circle to its diameter
- 7.5C solve mathematical and real-world problems involving similar shape and scale drawings
- 7.IS7\* explain man's limitations of understanding and uncovering all mathematical knowledge

## Proportionality

### 7.6 The student applies mathematical process standards to use probability and statistics to describe or solve problems involving proportional relationships.

- 7.IS2\* Demonstrate how sound logical arguments and other processes of mathematics are foundational to its discipline
- 7.IS3\* Recognize how mathematical arguments and processes can be extrapolated to other areas of study, including theology and philosophy
- 7.IS5\* Recognize personal bias in inquiry and articulate why inquiry should be undertaken in a fair and independent manner

|      |                                                                                                                                                         |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.6A | represent sample spaces for simple and compound events using lists and tree diagrams                                                                    |
| 7.6B | select and use different simulations to represent simple and compound events with and without technology                                                |
| 7.6C | make predictions and determine solutions using experimental data for simple and compound events                                                         |
| 7.6D | make predictions and determine solutions using theoretical probability for simple and compound events                                                   |
| 7.6E | find the probabilities of a simple event and its complement and describe the relationship between the two                                               |
| 7.6F | use data from a random sample to make inferences about a population                                                                                     |
| 7.6G | solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents |
| 7.6H | solve problems using qualitative and quantitative predictions and comparisons from simple experiments                                                   |
| 7.6I | determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces                                 |

## Expressions, Equations, and Relationships

**7.7 The student applies mathematical process standards to represent linear relationships using multiple representations.**

7.7A represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form  $y = mx + b$

## Expressions, Equations, and Relationships

**7.8 The student applies mathematical process standards to develop geometric relationships with volume.**

|        |                                                                                                                                                                                                              |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.8A   | model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas                             |
| 7.8B   | explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas   |
| 7.8C   | use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas                                                                    |
| 7.IS1* | explain the nature of rational discourse and argument and the desirability of precision and deductive certainty which mathematics makes possible and is not possible to the same degree in other disciplines |

## Expressions, Equations, and Relationships

**7.9 The student applies mathematical process standards to solve geometric problems.**

|      |                                                                                                                                                                                              |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.9A | solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids                                                                  |
| 7.9B | determine the circumference and area of circles                                                                                                                                              |
| 7.9C | determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles                              |
| 7.9D | solve problems involving the lateral and total surface area of a rectangular prism, rectangular pyramid, triangular prism, and triangular pyramid by determining the area of the shape's net |

## Expressions, Equations, and Relationships

**7.10 The student applies mathematical process standards to use one-variable equations and inequalities to represent situations.**

|       |                                                                                                                |
|-------|----------------------------------------------------------------------------------------------------------------|
| 7.10A | write one-variable, two-step equations and inequalities to represent constraints or conditions within problems |
| 7.10B | represent solutions for one-variable, two-step equations and inequalities on number lines                      |
| 7.10C | write a corresponding real-world problem given a one-variable, two-step equation or inequality                 |

## Expressions, Equations, and Relationships

**7.11 The student applies mathematical process standards to solve one-variable equations and inequalities.**

|       |                                                                                                                           |
|-------|---------------------------------------------------------------------------------------------------------------------------|
| 7.11A | model and solve one-variable, two-step equations and inequalities                                                         |
| 7.11B | determine if the given value(s) make(s) one-variable, two-step equations and inequalities true                            |
| 7.11C | write and solve equations using geometry concepts, including the sum of the angles in a triangle, and angle relationships |

## Measurement and Data

**7.12 The student applies mathematical process standards to use statistical representations to analyze data.**

|       |                                                                                                                                                                         |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.12A | compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads                                             |
| 7.12B | use data from a random sample to make inferences about a population                                                                                                     |
| 7.12C | compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations |

## Personal Financial Literacy

**7.13 The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor.**

|       |                                                                                                                                                                                                                                             |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.13A | calculate the sales tax for a given purchase and calculate income tax for earned wages                                                                                                                                                      |
| 7.13B | identify the components of a personal budget, including income; planned savings for college, retirement, and emergencies; taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget |
| 7.13C | create and organize a financial assets and liabilities record and construct a net worth statement                                                                                                                                           |
| 7.13D | use a family budget estimator to determine the minimum household budget and average hourly wage needed for a family to meet its basic needs in the                                                                                          |

# Standards – Grade 7 Mathematics

student's city or another large city nearby

7.13E calculate and compare simple interest and compound interest earnings

7.13F analyze and compare monetary incentives, including sales, rebates, and coupons