# Greenwich-Stow Creek Partnership Schools

## Third Grade

## Math Curriculum



**Approved by the Board of Education**

**Stow Creek Board of Education: 8-22-2024**

**Greenwich Board of Education: 8-21-2024**

# Mathematics » Grade 3 » Introduction

In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

- 1. Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.
- 2. Students develop an understanding of fractions, beginning with unit fractions. Students view fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. For example, 1/2 of the paint in a small bucket could be less paint than 1/3 of the paint in a larger bucket, but 1/3 of a ribbon is longer than 1/5 of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.
- 3. Students recognize area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.
- 4. Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

## Grade 3 Overview:

- **Operations and Algebraic Thinking**
  - o Represent and solve problems involving multiplication and division.

- o Understand properties of multiplication and the relationship between multiplication and division.
- o Multiply and divide within 100.
- o Solve problems involving the four operations and identify and explain patterns in arithmetic.

- **Number and Operations in Base Ten**
  - o Use place value understanding and properties of operations to perform multi-digit arithmetic.

- **Number and Operations—Fractions**
  - o Develop understanding of fractions as numbers.

- **Measurement**
  - o Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

  - o Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

  - o Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

- **Data Literacy**
  - ○ Understand data-based questions and data collection.
  - ○ Represent and interpret data.

- **Geometry**
  - o Reason with shapes and their attributes.

- **Mathematical Practices**
    - 1. Make sense of problems and persevere in solving them.
    - 2. Reason abstractly and quantitatively.
    - 3. Construct viable arguments and critique the reasoning of others.
    - 4. Model with mathematics.
    - 5. Use appropriate tools strategically.
    - 6. Attend to precision.
    - 7. Look for and make use of structure.
    - 8. Look for and express regularity in repeated reasoning.

# Grade 3 2023 NJSLS-Math

## A. Represent and solve problems involving multiplication and division

1. Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as $5 \times 7$.

2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.

3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1] 🌱

4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = ? \div 3$, $6 \times 6 = ?$.

## B. Understand properties of multiplication and the relationship between multiplication and division

5. Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find $8 \times 7$ as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.) {Clarification: Students need not use formal terms for these properties).

6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

## C. Multiply and divide within 100

7. With accuracy and efficiency, multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

## D. Solve problems involving the four operations, and identify and explain patterns in arithmetic

8. Solve two-step word problems, including problems involving money, using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (Clarification: This standard is limited to problems posed with whole numbers and having whole number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order) (Order of Operations) 🌱

9. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

Number and Operations in Base Ten                                                        3.NBT

A. Use place value understanding and properties of operations to perform multi-digit arithmetic

Clarification: A range of algorithms may be used

1. Use place value understanding to round whole numbers to the nearest 10 or 100.

2. With accuracy and efficiency, add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., $9 \times 80$, $5 \times 60$) using strategies based on place value and properties of operations.

Number and Operations - Fractions[2]                                                     3.NF

A. Develop understanding of fractions as numbers

1. Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into $b$ equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by $a$ parts of size $\frac{1}{b}$. For example: If a rectangle (i.e. the whole) is partitioned into 3 equal parts, each part is $\frac{1}{3}$. Two of those parts would be $\frac{2}{3}$.

2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.

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[2] Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8. Visual fraction models include tape diagrams, number lines, and area models.

a. Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into $b$ equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line. For example, partition the number line from 0 to 1 into 3 equal parts, represent $\frac{1}{3}$ on the number line and show that each part has a size $\frac{1}{3}$.

b. Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off $a$ lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.

3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

   a. Understand two fractions as equivalent (equal) if they are the same size. Understand two fractions as equivalent if they are located at the same point on a number line.

   b. Recognize and generate simple equivalent fractions by reasoning about their size, (e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$). Explain why the fractions are equivalent with the support of a visual fraction model.

   c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3 = \frac{3}{1}$; recognize that $\frac{6}{1} = 6$; locate $\frac{4}{4}$ and 1 at the same point on a number line diagram.

   d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions with the support of a visual fraction model.

A. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects

1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Clarification: "Measure and estimate liquid volumes and masses" excludes compound units such as $cm^3$ and finding the geometric volume of a container. "Multiplying to solve one-step word problems" excludes multiplicative comparison problems (problems involving "times as much"; See Glossary, Tables 2a-2d))

B. Geometric measurement: understand concepts of area and relate area to multiplication and to addition

3. Recognize area as an attribute of plane figures and understand concepts of area measurement.

   a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.

   b. A plane figure which can be covered without gaps or overlaps by $n$ unit squares is said to have an area of $n$ square units.

4. Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units).

5. Relate area to the operations of multiplication and addition.

   a. Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths.

   b. Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

   c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths $a$ and $b+c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.

   d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

C. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures

6. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. 🌱

Data Literacy                                                                                            3.DL

A. Understand data-based questions and data collection.

1. Develop data-based questions and decide what data will answer the question. (e.g. "What size shoe does a 3rd grader wear?", "How many books does a 3rd grader read?")

2. Collect student-centered data (e.g. collect data on students' favorite ice cream flavor) or use existing data to answer data-based questions.

B. Represent and interpret data

3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

5. Geometry      3.G

A. Reason with shapes and their attributes

1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.

**Ongoing Standards**
1. 3.OA.1.Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as $5 \times 7$.

2. 3.OA.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.

3. 3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. **Students may make sense of the idea that climate change affects the health of plants, animals and people. During an investigation they would record and represent weather and climate data which can be used as the basis for multiplication and division word problems. )**🌿

4. 3.OA.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \_ \div 3$, $6 \times 6 = ?$

| 3<sup>rd</sup> Grade Math Unit 1 | |
|---|---|
| **Domain: Operations & Algebraic Thinking** | **Marking Periods: 1,2, and Ongoing** |
| **Cluster Heading:** Represent and solve problems involving multiplication and division. Understand properties of multiplication and the relationship between multiplication and division. Multiply and divide within 100. Solve problems involving the four operations and identify and explain patterns in arithmetic. | |
| **Learning Targets—Modules and Standards** | |

## Unit 1 Understand Multiplication and Area

Module 1- Understand Multiplication

Lesson 1.1 Count Equal Groups
■ Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each.

Lesson 1.2 Relate Addition and Multiplication
■ Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each.

Lesson 1.3 Represent Multiplication with Arrays
■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Lesson 1.4 Understand the Commutative Property of Multiplication
■ Apply properties of operations as strategies to multiply and divide.

Lesson 1.5 Represent Multiplication with Number Lines
■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Lesson 1.6 Represent Multiplication with Bar Models
■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Module 2: Relate Multiplication and Area

Lesson 2.1 Understand Area by Counting Unit Squares
■ Recognize area as an attribute of plane figures and understand concepts of area measurement.
■ A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
Lesson 2.2 Measure Area by Counting Unit Squares
■ A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
■ Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
Lesson 2.3 Relate Area to Addition and Multiplication
■ Relate area to the operations of multiplication and addition.
■ Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
Lesson 2.4 Solve Problems with Area
■ Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
Lesson 2.5 Find the Area of Combined Rectangles
■ Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.
■ Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

# Operations and Algebraic Thinking                                3.OA

## A. Represent and solve problems involving multiplication and division

1. Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as $5 \times 7$.

2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.

3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[3]

4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = ? \div 3$, $6 \times 6 = ?$.

| Essential Questions | Enduring Understandings |
|---|---|
|  | ● Why are you able to multiply to find the area of each rectangle? |
| ● How did you decide what the number of objects in each group should be? |  |

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[3]

| | |
|---|---|
| <ul><li>How can you count equal groups to find the total?</li><li>How do you know which is the number of groups and which is the number of objects in each group for the problem?</li><li>How can you represent the problem with a multiplication equation?</li><li>How do you know how many spaces to jump in each jump?</li><li>What does the number of unit squares in a figure represent?</li><li>How would you describe the shape of this figure?</li><li>Why is it important to include the label with your number?</li><li>Why is repeated addition useful when finding the area of a rectangle?</li></ul> | <ul><li>Into what kinds of shapes could you break apart the figure?</li></ul><br>1.Use concrete and visual models to represent and solve problems when you know the number of equal groups and the number of objects in each group.<br>2. Use concrete and visual models or drawings to write related addition and multiplication equations.<br>3. Use an array model to represent a multiplication problem. Write a multiplication equation for an array.<br>4. Use the Commutative Property of Multiplication to find products and to write related multiplication equations.<br>5. Count equal groups on a number line to find how many.<br> 6. Use a bar model to represent an unknown in a multiplication problem. |

## Evidence of Learning

**Formative Assessment:**
- **Mid-Chapter Checkpoints**

**Summative Assessment:**
- **Chapter Review/Tests**

**Differentiation/Customizing Learning (strategies):**
- **Small group instruction with teacher**
- **Grab-and-Go Centers**
- **Differentiated manipulatives to model problems**
- **Computer based programs/Learning Games (Sumdog, Aleks, Epic learning videos…)**

**Materials:**
- **Counters**
- **Cubes**
- **White Boards**
- **Number Lines**
- **Square Tiles**
- **1-Centimeter Grid Paper**
- **Inch Rulers**
- **Geoboards with rubber bands**

**Vocabulary:**
 **factors, multiply, product, array, Commutative Property of Multiplication, area, square unit, unit square**

**Learning Plan:**
**Into Math**
**Module 1 Lessons 1-6**
**Module 2 Lessons 1-5**

**Accommodations for ELL:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary

- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Assistance from ESL teacher in a small group setting
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- INTOMATH Resources: online Spanish resources and other RTI activities/procedures for differentiated learning.
- Computer Programs/learning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for Special Education:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting
  INTOMATH Resources: online resources and other RTI activities/procedures for differentiated learning.
- Refer to student IEP
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for At-Risk Students:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting
- INTOMATH Resources: online resources and other RTI activities/procedures for differentiated learning.
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for Enrichment (G&T):**
- Extension activities
- Independent practice in small groups
- Internet activities
- INTOMATH: Each lesson offers Advanced activities for Differentiated instruction
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

| Interdisciplinary Connections |
|---|

- SCI.3.PS2.B [Disciplinary Core Idea] - Types of Interactions
- SCI.3.ESS2.D [*Disciplinary Core Idea*] - Weather and Climate
- SL.PI.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
- W.AW.3.1. Write opinion texts to present an idea with reasons and information.

- L.KL.3.1. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases.

- 6.1.5.CivicsPR.1: Compare procedures for making decisions in a variety of settings including classroom, school, government, and /or society.

**Integration of 21st Century Skills:  Career Readiness, Life Literacy, and Key Skills**

☐**9.1  Personal Financial Literacy**
Financial Health:  *Financial Psychology, Civic Financial Responsibility*
Financial Landscape:  *Financial Institutions, Economic & Government Influences*
Money Management:  *Planning & Budgeting, Risk Management & Insurance, Credit and Debit Management, Credit Profile*

☐**9.2  Career Awareness and Planning**

☐**9.4  Life Literacies and Key Skills**
Creativity and Innovation
Critical Thinking and Problem Solving
Global and Cultural Awareness

**Effective Integration of Technology: Computer Science and Design Thinking &  Life Literacies and Key Skills**

☐**8.1  Computer Science**
☒**8.2  Design Thinking**

☐**9.4  Life Literacies and Key Skills**
Digital Citizenship
Information and Media Literacy
Technology Literacy

**Effective Integration of Media Arts: Visual and Performing Arts Performance Standards**

☒**1.2 Media Arts**
Creating - Conceive, Develop, and/or Construct
Performing - Integrate, Practice, and/or Present
Responding - Perceive, Evaluate, and/or Interpret
Connecting - Synthesize and/or Relate

| 3rd Grade Unit 2 | |
| --- | --- |
| **Domain:** Operations and Algebraic Thinking (Multiplication and Division) | **Marking Period: 1, 2, and Ongoing** |

**Cluster Heading:** Represent and solve problems involving multiplication and division. Understand properties of multiplication and the relationship between multiplication and division. Multiply and divide within 100. Solve problems involving the four operations and identify and explain patterns in arithmetic.

**Overview of Unit:** To Understand the properties of multiplication and the relationship between multiplication and division.

## Learning Targets—Modules and Standards

# Unit 2 Multiplication and Division

Module 3: Understand Multiplication Strategies

Lesson 3.1 Multiply with 2 and 4

■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Lesson 3.2 Multiply with 5 and 10

■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Lesson 3.3 Multiply with 3 and 6

■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Module 4: Apply Multiplication Properties as Strategies

Lesson 4.1 Understand the Identity and Zero Properties of Multiplication

■ Apply properties of operations as strategies to multiply and divide.

Lesson 4.2 Understand the Distributive Property

■ Apply properties of operations as strategies to multiply and divide.

Lesson 4.3 Understand the Associative Property of Multiplication

■ Apply properties of operations as strategies to multiply and divide.

■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Lesson 4.4 Multiply with 7

■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

■ Apply properties of operations as strategies to multiply and divide.

Lesson 4.5 Multiply with 8

■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

■ Apply properties of operations as strategies to multiply and divide.

Lesson 4.6 Multiply with 9

■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

■ Apply properties of operations as strategies to multiply and divide.

Lesson 4.7 Identify Number Patterns on the Multiplication Table

■ Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

■ Apply properties of operations as strategies to multiply and divide.

Module 5: Multiplication with Multiples of 10

Lesson 5.1 Use the Distributive Property

● Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

■ Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.

Lesson 5.2 Use the Associative Property of Multiplication

● Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

■ Apply properties of operations as strategies to multiply and divide.

Lesson 5.3 Use Place-Value Strategies to Multiply with Multiples of 10

● Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

■ Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.

Lesson 5.4 Multiply Multiples of 10 by 1-Digit Numbers

● Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

## Module 6: Understand Division

Lesson 6.1 Represent Division ■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Lesson 6.2 Separate Objects into Equal Groups

■ Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

Lesson 6.3 Find the Number of Equal Groups

■ Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

Lesson 6.4 Relate Subtraction and Division

■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Lesson 6.5 Represent Division with Arrays

■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Lesson 6.6 Represent Division with Bar Models

■ Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

Lesson 6.7 Apply Division Rules for 1 and 0

■ Apply properties of operations as strategies to multiply and divide.

Domain: Understand Multiplication and Area

## Module 7: Relate Multiplication and Division

Lesson 7.1 Relate Multiplication and Division

■ Understand division as an unknown-factor problem. 1 day

Lesson 7.2 Write Related Facts

■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Lesson 7.3 Multiply and Divide with 2, 4, and 8

■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
Lesson 7.4 Multiply and Divide with 5 and 10
■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
 Lesson 7.5 Multiply and Divide with 3 and 6
■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
Lesson 7.6 Multiply and Divide with 7 and 9
■ Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
■ Apply properties of operations as strategies to multiply and divide.
Lesson 7.7 Build Fluency with Multiplication and Division
■ Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Module 8: Apply Multiplication and Division
Lesson 8.1 Identify and Extend Patterns
 ■ Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
Lesson 8.2 Find Unknown Factors and Numbers
■ Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
■ Understand division as an unknown-factor problem.
Lesson 8.3 Use Multiplication and Division to Solve Problem Situations
■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
■ Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
Lesson 8.4 Solve Two-Step Problems
■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
■ Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
Lesson 8.5 Practice with One- and Two- Step Problems
■ Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
■ Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

A. Represent and solve problems involving multiplication and division

1. Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as $5 \times 7$.

2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.

3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[4] 🌱

4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = ? \div 3$, $6 \times 6 = ?$.

B. Understand properties of multiplication and the relationship between multiplication and division

7. Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that 8 × 5= 40 and 8 × 2= 16, one can find 8 × 7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.) {Clarification: Students need not use formal terms for these properties).

8. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

C. Multiply and divide within 100

8. With accuracy and efficiency, multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

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[4]

D. Solve problems involving the four operations, and identify and explain patterns in arithmetic

10. Solve two-step word problems, including problems involving money, using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (Clarification: This standard is limited to problems posed with whole numbers and having whole number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order) (Order of Operations) 🌱

11. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

| Essential Ideas | Enduring Understandings |
|---|---|
| <ul><li>How could you use a tool to solve this problem?</li><li>How could you check to see if your answer is reasonable?</li><li>Why do you need to make 3 jumps on the number line?</li><li>In this problem, what is a group? What is the number of objects in each group?</li><li>How did you decide the number of jumps to make?</li><li>How did you decide how many spaces to jump on the number line?</li><li>What are some ways you have learned to represent equal groups?</li><li>How can you use doubles to find the product?</li><li>What other tools could you use to solve the problem?</li><li>How could you break apart the factor 4 or 5 into two numbers that are easier to multiply?</li><li>How would you break apart an array to make two smaller arrays with those numbers as factors?</li><li>Is there another type of group in this problem? How do you know?</li><li>How can you use multiplication properties to help you find products?</li><li>How will you decide which multiplication strategy to use?</li></ul> | 1. Achieve fluency with 2s and 4s multiplication facts.<br>2. Achieve fluency with 5s and 10s multiplication facts.<br>3. Achieve fluency with 3s and 6s multiplication facts.<br>4. Use the Identity and Zero Properties of Multiplication and patterns to write multiplication equations with the factors 1 and 0.<br>5. Use the Distributive Property as a strategy to find products by breaking apart a factor.<br>6. Use the Associative Property of Multiplication as a strategy to multiply with three factors.<br>7. Apply the Distributive Property or the Commutative Property of Multiplication, or use known facts to multiply with the factor 7.<br>8. Apply properties and use strategies to multiply with the factor 8.<br>9. Use patterns with 9s facts and the Distributive Property with addition or subtraction to find products with the factor 9.<br>10. Identify and explain patterns on the multiplication table by using properties of operations. |

- What type of visual model works best for problems about equal measurement quantities?
- What even and odd pattern do you notice about the products in the row for the factor 2 (4,5,)?
- How can you break apart this number to make multiplication easier?
- What would happen if you multiplied the numbers in a different order?
- How can you use parentheses to help organize the information in the problem?
- How do you know the number of tens in 30?
- How do you know there will be a 0 in the ones place?
- Describe your representation. How did you show equal groups?
- Which operations relate to equal groups?
- What information does the picture show?
- What do the counters represent?
- How can you use multiplication to make sure your answer is correct?
- What information is given in the problem? What do you need to find?
- How will you draw the arrangement?
- How do you know to stop placing tiles?
- What is the unknown in this problem?
- How can you use an array to write a multiplication equation?
- Given a set of numbers such as 5,6,and 30, how can you write a set of related facts?
- How can you use a table to find different patterns?
- How can you use your drawing to find the unknown?

11. Use the Distributive Property to break apart factors and find products in which one factor is a multiple of 10.
12. Use the Associative Property of Multiplication to break apart factors and find products in which one factor is a multiple of 10.
13. Use place value to break apart factors and find products in which one factor is a multiple of 10.
14. Use place value, regrouping, and visual and concrete models to find products of multiples of 10.
15. Represent and solve division problems.
16. Use concrete or visual models to separate objects into equal groups.
17. Use concrete or visual models to find the number of equal groups.
18. Use repeated subtraction and number lines to relate subtraction and division.
19. Use arrays to represent division.
20. Use bar models to represent division.
21. Identify and apply rules for dividing with 1 and 0.
22. Relate multiplication and division as inverse operations using concrete and visual models.
23. Write related multiplication and division facts.
24. Multiply and divide with 2,4,and 8 as factors and divisors.
25. Multiply and divide with 5 and 10 as factors and divisors.
26. Multiply and divide with 3 and 6 as factors and divisors.
27. Multiply and divide with 7 and 9 as factors and divisors.
28. Multiply and divide within 100 fluently.
29. Identify and extend arithmetic patterns to solve problems.
30. Determine the unknown number in a multiplication or division equation.
31. Model and solve equations that represent multiplication and division situations.
32. Develop strategies and use reasoning to represent and solve two-step word problems.
33. Solve one- and two-step problems that involve all four operations and a letter to represent the unknown.

| Evidence of Learning |
| --- |

Formative Assessment-
- Chapter Checkpoints

Summative Assessment:
- Chapter Review/Tests

Differentiation/Customizing Learning (strategies):
- Work with teacher in small group using intervention activities
- Use grab-and-go centers
- Use different manipulatives to model problems
- Computer based programs/learning games (Sumdog, Aleks, Epic learning videos…)

| Materials and Learning Plan |
| --- |

**Materials:**
**Two-color counters, square tiles, play money (nickels, pennies, dimes), connecting cubes, 1-inch grid paper, number lines, base ten blocks**
**Vocabulary:**
**doubles, multiple,Identify Property of Multiplication, Zero Property of Multiplication, Distributive Property, Associative Property of Multiplication, place value, multiple, regroup, divide, dividend, divisor, quotient, array, inverse operations, related facts, growing pattern, rule.**
**Learning Plan:**
**Into Math**
**Module 3 Lessons 1-3**
**Module 4 Lessons 1-7**
**Module 5 Lessons 1-4**
**Module 6 Lessons 1-7**
**Module 7 Lessons 1-7**
**Module 8 Lessons 1-5**

**Accommodations for Special Education:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting
- INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.
- Refer to student IEP
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for At-Risk Students:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting

- INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for Enrichment (G&T):**
- Extension activities
- Independent practice in small groups
- Internet activities
- INTOMATH: Each lesson offers Advanced activities for Differentiated instruction
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

## Interdisciplinary Connections

SCI.3.ESS2.D [*Disciplinary Core Idea*] - Weather and Climate

SL.PI.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

W.AW.3.1. Write opinion texts to present an idea with reasons and information.

L.KL.3.1. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

  A. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases.

RI.IT.3.3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

6.1.5. CivicsPR.1: Compare procedures for making decisions in a variety of settings including classroom, school, government, and /or society.

## Integration of 21st Century Skills:  Career Readiness, Life Literacy, and Key Skills

  ☐**9.1  Personal Financial Literacy**
    Financial Health:  *Financial Psychology, Civic Financial Responsibility*
    Financial Landscape:  *Financial Institutions, Economic & Government Influences*
    Money Management:  *Planning & Budgeting, Risk Management & Insurance, Credit and Debit Management, Credit Profile*

  ☒**9.2  Career Awareness and Planning**

  ☒**9.4  Life Literacies and Key Skills**
    Creativity and Innovation
    Critical Thinking and Problem Solving
    Global and Cultural Awareness

## Effective Integration of Technology: Computer Science and Design Thinking &  Life Literacies and Key Skills

  ☐**8.1  Computer Science**

⊠**8.2  Design Thinking**

☐**9.4  Life Literacies and Key Skills**
Digital Citizenship
Information and Media Literacy
Technology Literacy

**Effective Integration of Media Arts: [Visual and Performing Arts Performance Standards](#)**

⊠**1.2 Media Arts**
<mark>Creating - Conceive, Develop, and/or Construct</mark>
<mark>Performing - Integrate, Practice, and/or Present</mark>
<mark>Responding - Perceive, Evaluate, and/or Interpret</mark>
<mark>Connecting - Synthesize and/or Relate</mark>

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| 3rd Grade Unit 3 | |
|---|---|
| **Domain:** Number and Operations in Base Ten | **Marking Period: 2 and ongoing** |

**Cluster Heading:** Use place value understanding and properties of operations to perform multi-digit arithmetic.

**Learning Targets—Modules and Standards**

# Unit 3 Addition and Subtraction Strategies and Applications

**Module 9: Addition and Subtraction Strategies**

Lesson 9.1 Identify Number Patterns on
the Addition Table
■ Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

Lesson 9.2 Use Mental Math Strategies for Addition and Subtraction
● Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 9.3 Use Properties to Add
 ● Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 9.4 Use Mental Math to Assess Reasonableness
■ Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Lesson 9.5 Round to the Nearest Ten or Hundred
● Use place value understanding to round whole numbers to the nearest 10 or 100.

Lesson 9.6 Use Estimation with Sums and Differences
● Use place value understanding to round whole numbers to the nearest 10 or 100.

Module 10: Addition and Subtraction Within 1,000

Lesson 10.1 Use Expanded Form to Add
 ● Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 10.2 Use Place Value to Add

● Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 10.3 Combine Place Values to Subtract
● Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 10.4 Use Place Value to Subtract
● Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 10.5 Choose a Strategy to Add or Subtract
● Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 10.6 Model and Solve Two-Step Problems
■ Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Module 11: Understand Perimeter

Lesson 11.1 Describe Perimeter
● Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Lesson 11.2 Find Perimeter
● Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Lesson 11.3 Find Unknown Side Lengths
● Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Lesson 11.4 Represent Rectangles with the Same Area and Different Perimeters
● Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Lesson 11.5 Represent Rectangles with the Same Perimeter and Different Areas
● Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Module 12: Time Measurement and Intervals

Lesson 12.1 Tell and Write Time to the Minute
■ Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Lesson 12.2 Use a.m. and p.m. to Describe Time
■ Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Lesson 12.3 Measure Time Intervals
■ Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Lesson 12.4 Find Start and End Times
■ Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Lesson 12.5 Solve Time Interval Problems

■ Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

## Number and Operations in Base Ten 3.NBT

### A. Use place value understanding and properties of operations to perform multi-digit arithmetic

Clarification: A range of algorithms may be used

4. Use place value understanding to round whole numbers to the nearest 10 or 100.

5. With accuracy and efficiency, add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

6. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., $9 \times 80$, $5 \times 60$) using strategies based on place value and properties of operations.

| Essential Ideas | Enduring Understandings |
|---|---|
| <ul><li>How can you use the addition table to find a pattern?</li><li>What pattern can you find when adding even and odd numbers?</li><li>Why is 320 called a friendly number?</li><li>Why might adding 54 + 56 be easier than adding 54 + 89? What should you do after adding the first two numbers to find the total?</li><li>Why can you use friendly numbers to find a reasonable answer?</li><li>What operation should you use in the equation to solve the problem?</li><li>How do you know this question will have more than one correct answer?</li><li>Between which two numbers will the possible answers be?</li><li>What information from the map do you need to use to write a word problem?</li><li>Which tool could you use to solve the problem? Why is this tool more strategic?</li><li>How can you estimate your answer?</li><li>Which two operations can you use to solve the problem?</li><li>Should you use the sides of the pen or the entire space the pen covers to find how far it is around the pen?</li><li>How can you use a visual model to help you solve the problem?</li><li>How can you arrange the tiles?</li></ul> | 1. Identify and explain number patterns on the addition table by applying the Commutative and Identify Properties of Addition and by describing sums as even or odd.<br>2. Use mental math strategies to find sums and differences.<br>3. Use the Commutative and Associative Properties of Addition to add more than two addends.<br>4. Use mental math strategies to assess reasonableness of sums and differences.<br>5. Round whole numbers to the nearest ten or hundred.<br>6. Use rounding and compatible numbers to estimate sums and differences.<br>7. Use expanded form and partial sums to add 2- and 3- digit numbers.<br>8. Use place value strategies to add 2- and 3-digit numbers.<br>9. Use flexible grouping to combine place values to subtract 2- and 3- digit numbers.<br>10. Use place value strategies to subtract 2- and 3- digit numbers.<br>11. Choose a strategy to add or subtract to solve a problem.<br>12. Model and solve two-step problems.<br>13. Explore and find perimeter of polygons using grid paper or dot paper. |

- How many sides does the figure have?
- What label is important to include with your number?
- What do you know about the sides of rectangles?
- How could you find the perimeter of a rectangle?
- How many sides does this polygon have?
- What type of equation can you use to model the problem?
- How can you find the area of a rectangle you make with tiles?
- How do you know you can count by fives from 12 counterclockwise to 11?
- How is the day arranged on the number line?
- Why might the start time be located at the left end of the number line?
- Which numbers might be easier to count by?
- How is finding elapsed time on a clock like using a number line?

14. Estimate and measure perimeter of polygons using inch and centimeter rulers.
15. Find the unknown side length of a polygon when the perimeter and one side length is known.
16. Understand that rectangles with the same area can have different perimeters.
17. Understand that rectangles with the same perimeter can have different areas.
18. Read, write, and tell time on analog and digital clocks to the nearest minute.
19. Decide when to use a.m. and p.m. when telling time to the nearest minute.
20. Use an analog clock or a number line to measure time intervals in minutes.
21. Use a number line or an analog clock to add or subtract time intervals to find start or end times.
22. Apply strategies to solve word problems involving addition and subtraction of time intervals.

## Evidence of Learning

Formative Assessment:
- ▪ Mid- Chapter Checkpoints

Summative Assessment:
- ▪ Chapter Review/Tests

Differentiation/Customizing Learning (strategies):
- ●Work with teacher in small group using intervention activities
- ●Use grab-and-go centers
- ●Use different manipulatives to model problems
- ●Computer Programs/Learning Games  (Sumdog, Aleks, Epic learning videos…)

## Materials and Learning Plan

**Materials:**
- **square tiles, connecting cubes, Addition Table, Place-Value Chart, number lines, base-ten blocks, 1-inch square tiles, inch ruler, grid paper, Large Analog Clock, open number lines**

**Vocabulary:**
- **Commutative Property of Addition, Identify Property of Addition, Associative Property of Addition, round, estimate, compatible numbers, expanded form, regroup, perimeter, area, minute, a.m., p.m., midnight, noon, elapsed time**

**Learning Plan:**
**Into Math**
**Module 9 Lessons 1-6**
**Module 10 Lessons 1-6**
**Module 11 Lessons 1-5**
**Module 12 Lessons 1-5**

**Accommodations for ELL:**

- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Assistance from ESL teacher in a small group setting
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- INTOMath Resources: online Spanish resources and other RTI activities/procedures for differentiated learning.
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for Special Education:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting
- INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.
- Refer to student IEP
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for At-Risk Students:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting
- INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for Enrichment (G&T):**
- Extension activities
- Independent practice in small groups
- Internet activities
- INTOMATH: Each lesson offers Advanced activities for Differentiated instruction
- Computer programs/learning games (Sumdog, Aleks, Epic learning videos…)

SCI.3.ESS2.D [*Disciplinary Core Idea*] - Weather and Climate

SL.PI.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

L.KL.3.1. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

    A.  Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases.

6.1.5.EconET.1: Identify positive and negative incentives that influence the decisions people make

**Integration of 21st Century Skills: Career Readiness, Life Literacy, and Key Skills**

☒**9.1 Personal Financial Literacy**
Financial Health: *Financial Psychology, Civic Financial Responsibility*
Financial Landscape: *Financial Institutions, Economic & Government Influences*
Money Management: *Planning & Budgeting, Risk Management & Insurance, Credit and Debit Management, Credit Profile*

☒**9.2 Career Awareness and Planning**

9☐.4 **Life Literacies and Key Skills**
Creativity and Innovation
Critical Thinking and Problem Solving
Global and Cultural Awareness

**Effective Integration of Technology: Computer Science and Design Thinking & Life Literacies and Key Skills**

☐**8.1 Computer Science**
☐**8.2 Design Thinking**

☐**9.4 Life Literacies and Key Skills**
Digital Citizenship
Information and Media Literacy
Technology Literacy

**Effective Integration of Media Arts: Visual and Performing Arts Performance Standards**

☒**1.2 Media Arts**
Creating - Conceive, Develop, and/or Construct
Performing - Integrate, Practice, and/or Present
Responding - Perceive, Evaluate, and/or Interpret
Connecting - Synthesize and/or Relate

**3rd Grade Unit 4**

| **Domain:** Number and Operations-Fractions | **Marking Period: 3** |
|---|---|

**Cluster Heading:** Develop understanding of fractions as numbers.

**Overview of Unit:** Understand Fractions as Numbers, Relate Shapes, Fractions, and Area, Compare Fractions, Understand Equivalent Fractions

## Learning Targets—Modules and Standards

# Unit 4 Fractions
## Module 13: Understand Fractions as Numbers
Lesson 13.1 Describe Equal Parts of a Whole
■ Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.
■ Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.
Lesson 13.2 Represent and Name Unit Fractions
■ Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.
■ Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.
Lesson 13.3 Represent and Name Fractions of a Whole
■ Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by parts of size 1/b.
Lesson 13.4 Represent and Name Fractions on a Number Line
■ Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
■ Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
Lesson 13.5 Express Whole Numbers as Fractions
■ Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
■ Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers.
Lesson 13.6 Represent and Name Fractions Greater Than 1
■ Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a part of size 1/b.
■ Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
Lesson 13.7 Use Fractions to Measure Lengths
■ Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.
## Module 14: Relate Shapes, Fractions, and Area
Lesson 14.1 Relate Fractions and Area
 ■ Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.
Lesson 14.2 Partition Shapes into Equal Areas
■ Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.
Lesson 14.3 Use Unit Fractions to Describe Area
■ Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.
## Module 15: Compare Fractions
Lesson 15.1 Compare Fractions Using Concrete and Visual Models
■ Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

■ Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.
Lesson 15.2 Compare Fractions with the Same Denominator
■ Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
Lesson 15.3 Compare Fractions with the Same Numerator
■ Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
Lesson 15.4 Use Reasoning Strategies to Compare Fractions
■ Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
Module 16: Understand Equivalent Fractions
Lesson 16.1 Represent Equivalent Fractions with Smaller Parts
■ Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
■ Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.
Lesson 16.2 Represent Equivalent Fractions with Larger Parts
■ Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
■ Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.
Lesson 16.3 Recognize and Generate Equivalent Fractions
■ Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
■ Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

# Number and Operations - Fractions[5] 3.NF

## A. Develop understanding of fractions as numbers

4.  Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into $b$ equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by $a$ parts of size $\frac{1}{b}$. For example: If a rectangle (i.e. the whole) is partitioned into 3 equal parts, each part is $\frac{1}{3}$. Two of those parts would be $\frac{2}{3}$.

5.  Understand a fraction as a number on the number line; represent fractions on a number line diagram.

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[5] Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8. Visual fraction models include tape diagrams, number lines, and area models.

c. Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into $b$ equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line. For example, partition the number line from 0 to 1 into 3 equal parts, represent $\frac{1}{3}$ on the number line and show that each part has a size $\frac{1}{3}$.

d. Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off $a$ lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.

6. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

a. Understand two fractions as equivalent (equal) if they are the same size. Understand two fractions as equivalent if they are located at the same point on a number line.

b. Recognize and generate simple equivalent fractions by reasoning about their size, (e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$). Explain why the fractions are equivalent with the support of a visual fraction model.

c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3 = \frac{3}{1}$; recognize that $\frac{6}{1} = 6$; locate $\frac{4}{4}$ and 1 at the same point on a number line diagram.

d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions with the support of a visual fraction model.

| Enduring Understandings | Essential Ideas |
|---|---|
| • What shapes are the flags? How do their sizes compare to each other?<br>• What other tool can you use to solve the problem?<br>• What information is given in the problem?<br>• What does the picture show us? | 1. Use visual models of whole shapes partitioned into equal-sized parts to identify and represent halves, thirds, fourths, sixths, and eighths.<br>2. Represent and identify one equal part of a whole as a unit fractions, and use fraction notation to name unit fractions |

- What do we know about the number of parts in the design?
- How is finding a fraction of a group the same as finding the fraction of a whole?
- What do you notice about the numerator in each fraction?What do you notice about the denominator in each fraction? Why?
- What fraction names how the number line is divided? What information did you use to find this?
- How can you find the number of whole cartons?
- How do you determine the denominator in a fraction part of the mixed number?
- How are marks on a ruler like a number line?
- How do you know which mark shows one-half inch?
- How can you tell what each of the smaller marks represent?
- What is a unit square?
- What is the area of one unit square?
- How can you use unit squares to find the area of a shape drawn on grid paper?
- What does the rectangle show?
- What do you know about the areas of equal parts?
- How could you draw to show 2 equal parts?
- How do you know which number to use for the denominator?
- How do you know which number to use for the numerator?
- How can you compare ⅙ and ⅛ of the same object?
- How does the placement of ⅛ on a number line showing eighths compare with the placement of ⅓ on a number line showing thirds?
- What information helps you compare 2/8 and ⅔?
- How will you decide the number of ⅛-sized parts to use?
- How do you know this is correct?

that correspond to a part of  whole or a single item in a group of items.
3. Use visual models to represent and identify fractional parts of a whole or group that are composed of one or more unit fractions.
4. Identify, describe, and represent fractions on a number line, and relate fractions on a number line to parts of a whole and group fraction models.
5. Relate fractions and whole numbers by expressing whole numbers as fractions and recognizing fractions that are equivalent to whole numbers.
6. Identify, name, and represent fractions greater than 1, and wrote a fraction greater than 1  as a mixed number.
7. Measure lengths using a ruler that is marked off in fractional units to the nearest half or fourth of an inch.
8. Explore and identify equal areas of whole shapes.
9. Partition shapes into parts with equal areas.
10. Identify the unit fraction that names the area of each part of a shape partitioned into equal areas.
11. Use concrete and visual models to compare two fractions.
12. Use concrete or visual models and reasoning strategies to compare two fractions with the same denominator.
13. Use concrete or visual models and reasoning strategies to compare two fractions with the same numerator.
14. Use strategies to compare two fractions by reasoning with the same-sized pieces or the same number of pieces.
15. Use concrete or visual models to recognize and generate equivalent fractions in which the same whole is divided into a greater number of smaller equal parts.
16. Use concrete or visual models to recognize and generate equivalent fractions in which the same whole is divided into a smaller number of larger equal parts.
17. Recognize and generate equivalent fractions using visual models in which the same whole is divided into a

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|---|---|
| | smaller number of larger equal parts or a greater number of smaller equal parts. |

## Evidence of Learning

Formative Assessment:
- Mid- Chapter Checkpoints

Summative Assessment:
- Chapter Review/Tests

Differentiation/Customizing Learning (strategies):
- Work with teacher in small group using intervention activities
- Use grab-and-go centers
- Use different manipulatives to model problems
- Computer Programs/Learning Games  (Sumdog, Aleks, Epic learning videos…)

## Materials and Learning Plan

**Materials:**
**grid paper, square tiles, fraction circles, fraction strips, number lines, colored paper, inch ruler, 1-Centimeter grid paper, pattern blocks, fraction number lines**
**Vocabulary:**
**eighths, equal parts, fourths, halves, sixths, thirds, whole, fraction, unit fraction, denominator, numerator, fraction greater than 1, mixed number, equivalent fractions**
**Learning Plan:**
**Into Math**
**Module 13 lessons 1-7**
**Module 14 Lessons 1-3**
**Module 15 Lessons 1-4**
**Module 16 Lessons 1-3**
**Accommodations for ELL:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Assistance from ESL teacher in a small group setting
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- INTOMath Resources: online Spanish resources and other RTI activities/procedures for differentiated learning.
- Computer programs/learning games

**Accommodations for Special Education:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting

- INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.
- Refer to student IEP
- Computer programs/learning games

**Accommodations for At-Risk Students:**
- Frequent pauses for understanding and focus
- Develop an understanding of key vocabulary
- Use of drawings, maps and graphs
- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting
- INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.
- Computer programs/learning games

**Accommodations for Enrichment (G&T):**
- Extension activities
- Independent practice in small groups
- Internet activities
- INTOMATH: Each lesson offers Advanced activities for Differentiated instruction
- Computer programs/learning games

| Interdisciplinary Connections |
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SCI.3.ESS2.D [*Disciplinary Core Idea*] - Weather and Climate

SL.PI.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

L.KL.3.1. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

   A. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases.

6.1.5.EconET.1: Identify positive and negative incentives that influence the decisions people make

| Integration of 21st Century Skills:  Career Readiness, Life Literacy, and Key Skills |
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☐**9.1 Personal Financial Literacy**
Financial Health: *Financial Psychology, Civic Financial Responsibility*
Financial Landscape: *Financial Institutions, Economic & Government Influences*
Money Management: *Planning & Budgeting, Risk Management & Insurance, Credit and Debit Management, Credit Profile*

☐**9.2 Career Awareness and Planning**

**Effective Integration of Technology: Computer Science and Design Thinking & Life Literacies and Key Skills**

☐**8.1  Computer Science**
☐**8.2  Design Thinking**

☐**9.4  Life Literacies and Key Skills**
　　Digital Citizenship
　　Information and Media Literacy
　　Technology Literacy

**Effective Integration of Media Arts: Visual and Performing Arts Performance Standards**

☒**1.2 Media Arts**
　　Creating - Conceive, Develop, and/or Construct
　　Performing - Integrate, Practice, and/or Present
　　Responding - Perceive, Evaluate, and/or Interpret
　　Connecting - Synthesize and/or Relate

| 3rd Grade Unit 5 |
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| **Domain:** Measurement/Data Literacy | **Marking Periods: 3, 4** |
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**Cluster Heading:** Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

**Overview of Unit: Liquid Volume and Mass/Represent and Interpret Data**

| Learning Targets—Modules and Standards |
|---|

# Unit 5 Measurement and Data
# Measurement
Module 17: Liquid Volume and Mass
Lesson 17.1 Estimate and Measure Liquid Volume
■ Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes

that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

Lesson 17.2 Estimate and Measure Mass

■ Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

Lesson 17.3 Solve Problems About Liquid Volume and Mass

■ Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as
a beaker with a measurement scale) to represent the problem.

# Data Literacy

Module 18: Represent and Interpret Data

Lesson 18.1 Use Picture Graphs

■ Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.
■ Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Lesson 18.2 Make Picture Graphs

■ Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Lesson 18.3 Use Bar Graphs

■ Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Lesson 18.4 Make Bar Graphs

■ Draw a scaled picture graph and a scaled bar graph to represent a dataset with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Lesson 18.5 Use Line Plots to Display Measurement Data

■ Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

Lesson 18.6 Make Line Plots to Display Measurement Data

■ Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

Lesson 18.7 Solve One- and Two-Step Problems Using Data

■ Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

## Measurement 3.M

A. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects

7. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

8. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a

measurement scale) to represent the problem. (Clarification: "Measure and estimate liquid volumes and masses" excludes compound units such as cm$^3$ and finding the geometric volume of a container. "Multiplying to solve one-step word problems" excludes multiplicative comparison problems (problems involving "times as much"; See Glossary, Tables 2a-2d))

## B. Geometric measurement: understand concepts of area and relate area to multiplication and to addition

9. Recognize area as an attribute of plane figures and understand concepts of area measurement.

   c. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.

   d. A plane figure which can be covered without gaps or overlaps by $n$ unit squares is said to have an area of $n$ square units.

10. Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units).

11. Relate area to the operations of multiplication and addition.

   e. Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths.

   f. Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.

   g. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths $a$ and $b+c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.

   h. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

## C. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures

12. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

| Essential Ideas | Enduring Understandings |
|---|---|
| • Which of the containers is completely filled with liquid? <br> • Into which of the containers do you think you could pour more liquid? How do you know? <br> • Which tool could you use to solve the problem? Why is this tool more strategic? | 1. Use reasoning and benchmarks to estimate, and use tools to measure liquid volume in liters. <br> 2. Use reasoning and benchmarks to estimate, and use tools to measure mass in grams and kilograms. |

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| <ul><li>How do the liquids in each container compare?</li><li>What does it mean when the pans are balanced, or even?</li><li>How can you compare the four objects based on the pan balance results?</li><li>What amounts of water are represented by each part of the bar? How do you know?</li><li>What does each part of the bar model represent?</li><li>How do the parts of the bar model relate to each other?</li><li>What does the whole bar represent?</li><li>Why is multiplication an appropriate operation to use in your equation?</li><li>How do you know what each symbol represents?</li><li>Which tool could you use to solve the problem? Why is this more strategic?</li><li>How can you use the picture and description to give the graph a title?</li><li>What do the symbols represent?</li><li>Which operations can you use to find the number? Explain.</li><li>What does the table tell you about the categories you should use in our picture graph?</li><li>What do the labels on the left side of the graph show?</li><li>How can you use each bar in the graph to tell the number of votes?</li><li>Which tool could you use to solve the problem?</li><li>How is a bar graph like a picture graph? How is it different?</li><li>How will you record the answers to your survey question?</li><li>Into how many equal parts is each inch divided?</li><li>What labels could you put on the marks between 1 and 2?</li><li>What do the Xs represent?</li><li>How can you check your work?</li><li>What information should you include in the title?</li><li>How can you display the data?</li></ul> | <ol start="3"><li>Use representations and the four operations to solve one-step word problems involving liquid volume and mass.</li><li>Use information in a picture graph to solve one-step comparison problems.</li><li>Represent data in picture graphs and use the information to solve one-step comparison problems.</li><li>Use information in a bar graph to solve one-step comparison problems.</li><li>Represent data in scaled bar graphs and use the information to solve one-step comparison problems.</li><li>Read and interpret line plots involving data with fractional units of length.</li><li>Plot fractional data of standard units of length on a line plot.</li><li>Represent data in picture graphs, bar graphs, and line plots and use the information to solve one- and two-step comparison problems.</li></ol> |

## Evidence of Learning

Formative Assessment:
- Mid- Chapter Checkpoints

Summative Assessment:

- ▪ Chapter Review/Tests

Differentiation/Customizing Learning (strategies):
- ● Work with teacher in small group using intervention activities
- ● Use grab-and-go centers
- ● Use different manipulatives to model problems
- ● Computer Programs/Learning Games  (Sumdog, Aleks, Epic learning videos…)

## Materials and Learning Plan

**Materials:**
**Various-sized containers, 1-liter measuring cup, water, pan balance, various classroom objects, paper clip (1 gram), book (1 kilogram), gram masses, kilogram masses, two-color counters, connecting cubes, base-ten blocks, square tiles, ruler with ¼ inches, number line**

**Vocabulary:**
**liquid volume, liter (L), mass, gram (g), kilogram (kg), key, picture graph, bar graph, horizontal bar graph, scale, vertical bar graph, line plot**

**Learning Plan:**
**Into Math**
**Module 17 Lessons 1-3**
**Module 18 Lessons 1-7**
**Accommodations for ELL:**
- ● Frequent pauses for understanding and focus
- ● Develop an understanding of key vocabulary
- ● Use of drawings, maps and graphs
- ● Engaging dialogue and discussion
- ● Assistance from ESL teacher in a small group setting
- ● Use of manipulatives
- ● Tools (rulers, measuring cups, etc.)
- ● Multi-leveled cooperative learning groups
- ● INTOMath Resources: online Spanish resources and other RTI activities/procedures for differentiated learning.
- ● Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for Special Education:**
- ● Frequent pauses for understanding and focus
- ● Develop an understanding of key vocabulary
- ● Use of drawings, maps and graphs
- ● Engaging dialogue and discussion
- ● Use of manipulatives
- ● Tools (rulers, measuring cups, etc.)
- ● Multi-leveled cooperative learning groups
- ● Assistance from Special Education teacher in a small group setting
- ● INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.
- ● Refer to student IEP
- ● Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for At-Risk Students:**
- ● Frequent pauses for understanding and focus
- ● Develop an understanding of key vocabulary
- ● Use of drawings, maps and graphs

- Engaging dialogue and discussion
- Use of manipulatives
- Tools (rulers, measuring cups, etc.)
- Multi-leveled cooperative learning groups
- Assistance from Special Education teacher in a small group setting
- INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.
- Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…)

**Accommodations for Enrichment (G&T):**
- Extension activities
- Independent practice in small groups
- Internet activities
- INTOMATH: Each lesson offers Advanced activities for Differentiated instruction
- Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…)

## Interdisciplinary Connections

SCI.3-ESS2-1 [*Performance Expectation*] - Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

SL.PI.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. 🌱

W.AW.3.1. Write opinion texts to present an idea with reasons and information. 🌱

L.KL.3.1. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

    A. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases.

RI.IT.3.3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

6.1.5.CivicsPR.1: Compare procedures for making decisions in a variety of settings including classroom, school, government, and /or society.

6.1.5.EconET.1: Identify positive and negative incentives that influence the decisions people make

## Integration of 21st Century Skills:  Career Readiness, Life Literacy, and Key Skills

    ☒**9.1  Personal Financial Literacy**
        Financial Health:  *Financial Psychology, Civic Financial Responsibility*
        Financial Landscape:  *Financial Institutions, Economic & Government Influences*
        Money Management:  *Planning & Budgeting, Risk Management & Insurance, Credit and Debit Management, Credit Profile*

    ☒**9.2  Career Awareness and Planning**

| ☒**9.4 Life Literacies and Key Skills** |
|---|
| Creativity and Innovation |
| Critical Thinking and Problem Solving |
| Global and Cultural Awareness |

**Effective Integration of Technology: Computer Science and Design Thinking & Life Literacies and Key Skills**

| ☐**8.1 Computer Science** |
|---|
| ☐**8.2 Design Thinking** |
| |
| ☒**9.4 Life Literacies and Key Skills** |
| Digital Citizenship |
| Information and Media Literacy |
| Technology Literacy |

**Effective Integration of Media Arts: Visual and Performing Arts Performance Standards**

| ☒**1.2 Media Arts** |
|---|
| Creating - Conceive, Develop, and/or Construct |
| Performing - Integrate, Practice, and/or Present |
| Responding - Perceive, Evaluate, and/or Interpret |
| Connecting - Synthesize and/or Relate |

| **3rd Grade Unit 6** | |
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| **Domain:** Geometry | **Marking Period: 4** |
| **Cluster Heading:** Reason with shapes and their attributes. | |
| **Overview of Unit: Define Two-Dimensional Shapes/Categorize Two-Dimensional Shapes** | |
| **Learning Targets—Modules and Standards** | |

# Unit 6 GEOMETRY

**Module 19: Define Two-Dimensional Shapes**

Lesson 19.1 Describe Shapes
■ Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson 19.2 Describe Angles in Shapes
■ Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson 19.3 Describe Sides of Shapes

■ Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson 19.4 Define Quadrilaterals

■ Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Module 20: Categorize Two-Dimensional Shapes

Lesson 20.1 Draw Quadrilaterals

■ Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson 20.2 Categorize Quadrilaterals

■ Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson 20.3 Categorize Plane Shapes

■ Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Geometry      3.G

A. Reason with shapes and their attributes

3.  Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

4.  Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

    For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.

| Essential Ideas | Enduring Understandings |
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| <ul><li>What is the shape of the entire gate?</li><li>How can you describe shapes?</li><li>How can you draw a polygon to show the problem?</li><li>What is the difference between a side and an angle?</li><li>Which tool could you use to solve the problem? Why is this tool more strategic?</li><li>Trace a corner of a square piece of paper. What kind of angle did you draw?</li></ul> | 1. Describe open and closed shapes in terms of their sides, angles, and other attributes.<br>2. Describe the angles of polygons and define and identify right angles.<br>3. Describe and compare the sides of polygons as equal in length and as parallel.<br>4. Identify attributes of quadrilaterals and use the attributes to name those quadrilaterals. |

- How can you tell if 2 sides drawn on dot paper are equal in length?
- How can you tell if 2 sides drawn on dot paper are the same distance apart at all points?
- What is the length of each blue side in Plan B?
- What would happen if you extend the red line segments of shape D?
- How many right angles should the sign have?
- How can you describe the other angles that are not right angles?
- What is the difference between a rectangle and a square?
- Which quadrilaterals have 2 pairs of parallel sides?
- Which of those quadrilaterals do not have to have right angles?
- Is it possible for a rhombus to have 2 sides that are different in length? Why?
- What is the difference between the words exactly 1 pair and at least 1 pair?
- Why do you think a shape can be in more than one category of shapes?
- How would you describe the number of sides of the quadrilaterals?
- What name would you give to the center part of the Venn diagram where the circles overlap?
- If a shape does not belong in either circle, what can you say about the shape?

5. Identify and draw quadrilaterals that may or may not belong to the same subcategory, such as square, rectangle, or rhombus.
6. Categorize quadrilaterals with respect to the number of parallel sides, sides of equal length, and right angles they have.
7. Categorize quadrilaterals with respect to the number of parallel sides, sides of equal length, and right angles.

## Evidence of Learning

Formative Assessment:
- Mid- Chapter Checkpoints

Summative Assessment:
- Chapter Review/Tests

Differentiation/Customizing Learning (strategies):
- Work with teacher in small group using intervention activities
- Use grab-and-go centers
- Use different manipulatives to model problems
- Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…)

## Materials and Learning Plan

**Materials:**
**rulers, pattern blocks, Dot Paper, Geoboards, bands, rulers, colored paper, straightedge, Venn Diagram, Tally Table,**

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| **Vocabulary:**<br>**angle, closed shape, line segment, open shape, plane shape, polygon, side, vertex, right angle, parallel lines, parallelogram, rhombus, trapezoid, quadrilateral**<br><br>**Learning Plan:**<br>**IntoMath**<br>**Module 19 Lessons 1-4**<br>**Module 20 Lessons 1-3** |
| **Accommodations for ELL:**<br>● Frequent pauses for understanding and focus<br>● Develop an understanding of key vocabulary<br>● Use of drawings, maps and graphs<br>● Engaging dialogue and discussion<br>● Assistance from ESL teacher in a small group setting<br>● Use of manipulatives<br>● Tools (rulers, measuring cups, etc.)<br>● Multi-leveled cooperative learning groups<br>● INTOMath Resources: online Spanish resources and other RTI activities/procedures for differentiated learning.<br>● Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…) |
| **Accommodations for Special Education:**<br>● Frequent pauses for understanding and focus<br>● Develop an understanding of key vocabulary<br>● Use of drawings, maps and graphs<br>● Engaging dialogue and discussion<br>● Use of manipulatives<br>● Tools (rulers, measuring cups, etc.)<br>● Multi-leveled cooperative learning groups<br>● Assistance from Special Education teacher in a small group setting<br>● INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.<br>● Refer to student IEP<br>● Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…) |
| **Accommodations for At-Risk Students:**<br>● Frequent pauses for understanding and focus<br>● Develop an understanding of key vocabulary<br>● Use of drawings, maps and graphs<br>● Engaging dialogue and discussion<br>● Use of manipulatives<br>● Tools (rulers, measuring cups, etc.)<br>● Multi-leveled cooperative learning groups<br>● Assistance from Special Education teacher in a small group setting<br>● INTOMath Resources: online resources and other RTI activities/procedures for differentiated learning.<br>● Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…) |
| **Accommodations for Enrichment (G&T):**<br>● Extension activities<br>● Independent practice in small groups<br>● Internet activities |

- INTOMATH: Each lesson offers Advanced activities for Differentiated instruction
- Computer programs/leaning games (Sumdog, Aleks, Epic learning videos…)

| Interdisciplinary Connections |
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SL.PI.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

W.AW.3.1. Write opinion texts to present an idea with reasons and information.

L.KL.3.1. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

    A. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases.

6.1.5.EconET.1: Identify positive and negative incentives that influence the decisions people make

| Integration of 21st Century Skills:  Career Readiness, Life Literacy, and Key Skills |
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☐ **9.1  Personal Financial Literacy**
    Financial Health:  *Financial Psychology, Civic Financial Responsibility*
    Financial Landscape:  *Financial Institutions, Economic & Government Influences*
    Money Management:  *Planning & Budgeting, Risk Management & Insurance, Credit and Debit Management, Credit Profile*

☒ **9.2  Career Awareness and Planning**

☒ **9.4  Life Literacies and Key Skills**
    Creativity and Innovation
    Critical Thinking and Problem Solving
    Global and Cultural Awareness

| Effective Integration of Technology: Computer Science and Design Thinking & Life Literacies and Key Skills |
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☐ **8.1  Computer Science**
☒ **8.2  Design Thinking**

☐ **9.4  Life Literacies and Key Skills**
    Digital Citizenship
    Information and Media Literacy
    Technology Literacy

| Effective Integration of Media Arts: Visual and Performing Arts Performance Standards |
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☒ **1.2 Media Arts**
    Creating - Conceive, Develop, and/or Construct
    Performing - Integrate, Practice, and/or Present
    Responding - Perceive, Evaluate, and/or Interpret
    Connecting - Synthesize and/or Relate