# **Applied Studies Curriculum Map (Accessible)**

# **Domain: Mathematics**

Note: The use of a calculator is permitted for all math activities

## Competency and Definition: Time, Task, and Resource Management (MATH-TTRM)

Workplace Readiness Skills: 1, 15, 16

### Level 1: Recognize and Recall

1. Identify numbers 1-60, days of the week, months of the year
2. Respond to timer-based systems during daily activities

### Level 2: Identify and Comprehend

1. Find a specified date on a calendar
2. Access and follow a personalized daily schedule (e.g. visual, auditory)
3. Identify the time using digital and/or analog clocks (hours, half hours, minutes)
4. Calculate elapsed time using digital or analog clocks

### Level 3: Interpret and Understand

1. Prioritize activities, from a given set, to develop a personal daily, weekly, and/or monthly schedule
2. Use digital and analog clocks at all intervals (hour, half-hour, minute) to comment on the time, estimate time needs, and solve real-life problems
3. Demonstrate knowledge of equivalent units of time (i.e., 1 hour = 60 minutes; 1 day = 24 hours)
4. Predict the length of time a given event will take

### Level 4: Apply and Generalize

1. Utilize a calendar to plan for and participate in a variety of activities
2. Use a calendar to coordinate events or activities with others
3. Create a schedule to plan for, participate in and follow academic, work-related, and leisure activities (daily, weekly and monthly)
4. Use clocks and watches or other electronics to understand time, predict, and prepare for events

## Competency and Definition: Data Sense (MATH-DATA)

The student demonstrates ability to collect and use data to make informed decisions

Workplace Readiness Skills: 16

### Level 1: Recognize and Recall

1. Gather data by counting and tallying
2. With information provided, sort necessary from unnecessary data
3. Recognize that a graph provides information

### Level 2: Identify and Comprehend

1. Identify various forms of data collection (reflective of daily activities), using graphs
2. Categorize data to put in usable format
3. Insert data into a pre-constructed template
4. Use graph data to answer questions
5. Compare two sets of data within a single data display

### Level 3: Interpret and Understand

1. Collect and organize data, using surveys, observations, measurements, or experiments
2. Determine most appropriate form of data representation
3. Given a model, interpret data on a graph in order to explain the information it provides
4. Interpret and explain information displayed in a graph, using the vocabulary *more, less, fewer, greater than, less than,* and *equal to*
5. Calculate and describe the mean, median, mode, and range of a set of data

### Level 4: Apply and Generalize

1. Given a problem situation, collect, organize, display, and draw conclusions from the data
2. Compile data to construct a simple graph and explain the data
3. Use data to make hypotheses about the information
4. Summarize data distributions on a graph or table
5. Analyze data from a variety of graphs to answer questions
6. Use calculations and descriptions of the mean, median, mode, and range of a set of data to solve real life problems

## Competency and Definition: Mathematical Reasoning (MATH-MR)

The student uses mathematical principles and reasoning to accomplish tasks.

Workplace Readiness Skills:16

### Level 1: Recognize and Recall

1. Count by twos, fives and tens
2. Recognize wholes, halves, and one-quarters
3. Discriminate between equal and unequal groups of objects
4. Sort like and unlike items
5. Locate a number on a number line
6. Recognize the place value of a digit within a number
7. Identify numbers 1-100 in numerals
8. Transpose numbers in written or typed format into a calculator
9. Transpose numbers in written or typed format into a software programs
10. Recall, repeat and protect identifying numbers (i.e., phone number, parent’s phone number, address, and birthday)
11. Recognize use of software programs for mathematical use

### Level 2: Identify and Comprehend

1. Solve real world division problems with equal and unequal groups of countable objects. Numbers used in the problems should be within 1000 without remainders
2. Partition sets or groups into equal shares
3. Describe the shares using fraction language
4. Identify when two amounts have equivalent values, including whole and rational numbers
5. Comprehends math directional words
6. Recognize different types of patterns (shape, color, number)
7. Classify different types of patterns (i.e., A, B, A; A, B, B, A.; A, B, C)
8. Represent fractions as a number on a number line including mixed numbers
9. Recognize and identify multiple representations of a number
10. Build whole numbers using multiple representations
11. Identify place value of decimals
12. Sequence 1-100
13. Count to 100 with one-to-one correspondence
14. Use a variety of calculators to solve basic mathematical functions
15. Identify personal or descriptive variables in multiple number formats, (i.e., Birthday = July 19 or 7/19, it is May 15, 2016 or 5/15/2016 or 5/15/16, or Phone: (804)555-5555 or 804-555-5555 or 555-5555)
16. Define math vocabulary (i.e., more than, less than, solve, estimate)

### Level 3: Interpret and Understand

1. Understand inverse operations
2. Build decimals using multiple representations
3. Given a division problem, solve for the whole or a part
4. Describe lengths on a number line using fractions
5. Solve equivalence problems and determine if each person received an equal amount
6. Identify the output when given the input and a given function
7. Interpret and extend patterns
8. Compare two fractions (the fractions could be equivalent) by creating common denominators, or by comparing to a benchmark fraction (0, ½, 1, etc.)
9. Compare values of numbers 1-100,000
10. Add and subtract numbers between 1 and 100
11. Use a calculator to compute sums and differences when given mathematical problems
12. Use a software program to compute problems and order lists of numbers
13. Identify what mathematical whole number skills and prerequisites are necessary to achieve post-secondary goals (i.e., community college, vocation)

### Level 4: Apply and Generalize

1. Use whole numbers and decimals to solve multiplicative comparison problems that describe a proportion in a real world application
2. Solve ratio problems in a real world application using fractions where the ratio describes a part-part relationship
3. Generate equivalent fractions, decimals, and percentages
4. Compare fractions, decimals, and percentages by using equivalencies or by comparing to a benchmark
5. Analyze the general form of a pattern and apply it/make predictions
6. Demonstrate problem solving that includes part-whole and ordering relationships
7. Solve real world problems using decimals
8. Recognize, order, and compare numbers through 100,000,000
9. Multiply and divide whole numbers up to the thousandths place
10. Demonstrate understanding of how to use a calculator (which functions to choose) to solve mathematical problems requiring division and multiplication
11. Use a software program to analyze data
12. Complete practice activities specific to post-secondary goals (i.e., Take the whole number math portions of practice tests for college entrance exams or word problems related to vocation)

## Competency and Definition: Geometric and Spatial Reasoning (MATH-GSR)

The student uses geometric properties to solve real-world problems.

Workplace Readiness Skills: 16

### Level 1: Recognize and Recall

1. Sort 2-dimensional plane figures by a variety of basic properties (size, shape, angles, name)
2. Determine inside, outside, and edge of a given shape
3. Distinguish between a shorter or longer distance
4. Recognize when two figures are congruent by matching congruent sides and/or angles

### Level 2: Identify and Comprehend

1. Identify plane figures with more than four vertices
2. Find the area and perimeter of plane figures
3. Compare the steepness of two or more lines
4. Compare distances, lengths, areas and volumes on comparable items
5. Find the midpoint of a given line
6. Calculate slope (i.e., rise/run) by counting blocks on a coordinate plane
7. Identify the number of sides and angles on a plane figure
8. Identify the concept of middle for a variety of figures

### Level 3: Interpret and Understand

1. Determine whether to use perimeter or area based on a given real-life situation
2. Construct a variety of figures that have similar area or perimeter
3. Measure a given line to determine length/distance (i.e., scale on a map)
4. Interpret a given problem to determine whether to calculate slope, midpoint, and distance

### Level 4: Apply and Generalize

1. Describe attributes of plane figures and apply those attributes to draw basic conclusions (i.e., I know this is a square so the angles must be 90°)
2. Apply formulas for perimeter and area of a given shape to solve for unknown real-world values
3. Find the slope, midpoint, and distance to solve real-life problems in a variety of ways
4. Demonstrate understanding of spatial planning and reasoning

## Competency and Definition: Measurement (MATH-MEAS)

The student uses different system of measurement to solve real-world problems

Workplace Readiness Skills: 16

### Level 1: Recognize and Recall

1. Determine how objects compare to one another based on length and height
2. Recognize tools used to measure mass/weight
3. Compare two items based on relative weight
4. Compare which container can hold more or less of a given substance
5. Recognize tools used to measure temperature
6. Compare the relative temperature with the terms cold, warm, or hot
7. Recognize multiple ways to measure various items or elements such as weight, height, volume, temperature, etc.
8. Recognize tools used to measure liquid, solid, temperature and other physical attributes of objects
9. Recognize the type of measurement used by the designation of measurement
10. Recognize approximate size of common items by type and amount of measurement used
11. Recognize equivalent measures

### Level 2: Identify and Comprehend

1. Measure a given object using a ruler to the nearest half-unit
2. Determine the weight of a given object or objects using a scale
3. Measure volume in containers through given unit (i.e., cups, pints, quarts, gallons)
4. Using a thermometer, determine the temperature in Celsius and Fahrenheit
5. Identify smaller and larger units of measure in customary system
6. Identify smaller and larger units of measure in metric system
7. Identify the most appropriate unit of measurement to solve a problem
8. Recognize that there are multiple ways to measure a given object
9. Read and comprehend measurement vocabulary and what symbols go with which measurement tools
10. Recognize freezing and boiling temperatures in both customary and metric systems

### Level 3: Interpret and Understand

1. Determine length by drawing a non-scale model and utilizing basic operations to solve for length (i.e., length of a trip)
2. Measure a given object to its exact length
3. Estimate the weight of an object, then through measurement, compare and contrast the weights of two given objects
4. Compare volume of two given figures
5. Determine the implication of relative temperature values on daily life (i.e., it is 60° so long sleeves may be appropriate)
6. Recognize equivalent measures within the standard measurement system
7. Apply knowledge of equivalent measures within the metric measurement system

### Level 4: Apply and Generalize

1. Apply various methods (i.e., distance formula) to determine the length of an unknown value without using a ruler.
2. Through estimation, compare and contrast the weights of two given objects
3. Given a problem involving mass, predict the number of units required for an item of different magnitude
4. Determine the shape of a given real-world figure and then locate the correct formula to determine volume of the given figure
5. Determine temperature change (including moving from negative to positive temperatures) in a given real world situation
6. Convert various measures into other appropriate units of measurement
7. Estimate appropriate measures between customary and metric measurement systems

## Competency and Definition: Money Management (MATH-MONEY)

The student uses money appropriately to purchase goods and services, plan a personal budget, and make financial decisions

Workplace Readiness Skills:

### Level 1: Recognize and Recall

1. Recognize available forms of currency: cash, credit, debit, check book
2. Discriminate values of commonly used coins
3. Discriminate between commonly used bills
4. Arrange multiple representations of money values. (e.g., 25 cents = 25 pennies, or 2 dimes and a nickel)
5. Recognize real or model ATM and credit cards
6. Pay for simple purchases using debit or credit card
7. Pay for purchases using next dollar strategy

### Level 2: Identify and Comprehend

1. Identify value of commonly used coins and bills
2. Find sums and differences of money with like units (all nickels, all dollar bills, etc.)
3. Identify patterns associated with making change from whole number values (subtraction with re-grouping)
4. Counts a variety of combinations of coins and bills up to five dollars
5. Compares values of two or more products to identify which is more and less expensive
6. Pays for simple choice purchases independently in at least 3 different environments
7. Understands association between ATM cards and credit cards and payment

### Level 3: Interpret and Understand

1. Find products and quotients of money with like units (all nickels, all dollar bills, etc.)
2. Apply concepts for making change in the most efficient manner (i.e., using 2 quarters and 2 dimes as opposed to 70 pennies
3. Investigate patterns for making change with mixed number values up to thousands of dollars (subtraction with re-grouping and division)
4. Counts a variety of combinations of coins and bills up to fifty dollars
5. Counts and records values of coins and bills to find sum of money
6. Makes change from given amount of money
7. Use a calculator to compute sums and differences when given a word problem relating to money and purchase with an ATM and credit card
8. Use a software program to compute problems and order lists of values
9. Use software template to populate values in a simple budget
10. Locate, select, and purchase necessary items such as food and/or personal care items
11. Explain the steps for opening and maintaining a checking account
12. Stores and responsibly manages checks, cards and cash
13. Explain the steps for opening and maintaining a savings account
14. Calculate tip/tax/discount using percentages (including percent of increase, percent of decrease)
15. Calculate interest rates on loans

### Level 4: Apply and Generalize

1. Find sums, differences, products, and quotients of money with mixed units
2. Identify qualifications to obtain credit or bank account
3. Analyze credit card features and their impact on personal financial planning
4. Compare and contrast terms and conditions of various sources of consumer credit
5. Finds total from a list of items and services to adjust and prioritize spending based on available funds or estimated costs associated with independent living (grocery list, bills)
6. Interpret and analyze interest rates on purchases made with a credit card
7. Interpret and analyze purchases made with ATM cards based on real or model banking account information
8. Express preferred method of payment for a variety of large and small purchases for needs and wants
9. Use online tools and banking to monitor account (e.g., personal checking and/or savings; returns/investments accounts)
10. Comparison shops based on multiple factors
11. Explains benefits and costs of using a line of credit; Avoids opening multiple lines of credit

## Competency and Definition: Ratios and Proportions (MATH-RATIO)

The student uses proportions to solve real-world problems

Workplace Readiness Skills: 16

### Level 1: Recognize and Recall

1. Compare numbers and determine which is greater or smaller
2. Define percent as part of a whole, where the whole is 100

### Level 2: Identify and Comprehend

1. Identify parts of a ratio
2. Represent or model percentages
3. Compare and contrast percentages using models

### Level 3: Interpret and Understand

1. Calculate, compare, and contrast unit rates (per mile, per ounce, per gallon, etc.). [The concept of per.]
2. Solve rate division problems involving constant speed and pricing. Numbers used in the problems should include whole numbers and decimals
3. Calculate the percent of a number (tip, tax, interest, discount, etc.)
4. Determine the total amount based on tip, tax, interest, discount, etc.

### Level 4: Apply and Generalize

1. Explore the multiplicative relationships between the parts of a ratio to make predictions (e.g., if x/y = ¼ then y = 4x; if it takes x minutes to do this one task how long will it take to do 20 tasks)
2. Determine the percent increase and the percent decrease
3. Apply and construct concepts of percentage to graphical representations
4. Construct circle graphs using percentage data
5. Estimate total costs of purchases, taxes and/or tips