# Statewide Transportation, Distribution, and Logistics (TDL) Curriculum:

## Contextualized Math Module

# Statewide Transportation, Distribution, and Logistics Curriculum:  Contextualized Math Module

**<span style="color:red">*Supplemental material may be found in the TDL Math Resource File</span>**

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**FOUNDATIONS FOR DESIGN**

- ✓ Instruction emphasizes learning by doing through projects and simulations; therefore, the instructor is a facilitator or learning coach.
- ✓ Each module emphasizes communication, teamwork, and critical thinking.
- ✓ Content is contextualized for transportation, distribution and logistics (TDL) professions and their programs of study.
- ✓ Learning outcomes often require learners to meet and interact with academic and TDL professionals, engage in collaborative and individual projects involving authentic materials and resources, visit TDL and academic facilities, and complete documents and writing tasks for career paths with the guidance of learning facilitators.
- ✓ Specific units within modules may serve as precursors for additional units within the module. Many lessons and units may be repeated and expanded from one module to another.
- ✓ Self-advocacy and continual self-assessment and self-monitoring are inherent to each module while students must be introduced to, required to meet with, and encouraged to consult with the program coordinator as well as academic and employment professionals.
- ✓ Site visits to TDL and learning facilities, guest speakers, and conferences with employment and academic professionals are integral to the relevance and value of the program for students.

**ASSUMPTIONS:**

- ✓ Each agency or instructor who may use these modules or this program will adapt instructional strategies, content level of difficulty, learning activities and projects to meet the needs of the program's target population and adult learners of lower and higher academic levels.

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- ✓ Referenced resources, relevant internet links, learning activities (created, suggested, attached, or referenced) will be used, modified, or omitted based on student need and restraints of class time and resources.
- ✓ This curriculum will work in established internal partnerships within the academic community as well as external partnerships/relationships in the employment community.
- ✓ Units and lessons will be adapted to fit within varying contact hours of a program.

**Rationale:** As adult education students train to enter the workforce, they need skills in a large variety of mathematical concepts. Many of these concepts need to be reviewed and relearned and may be best learned in the context of the field that the student plans to enter.

**Module Description:** The mathematics skills module offers the adult learner the opportunity to learn the basic mathematics skills necessary for use in the transportation, distribution, and logistics workplace and/or post-secondary education. The module presents mathematics in the practical context of industries such as the warehousing, loading and distribution of goods, logistics relating to delivery, and the transportation of goods and related careers including automotive and diesel technology. Students develop study skills in math including review of arithmetic skills as they apply to career problems. The course covers fractions, rounding, decimal fractions, ratios, proportions, percentages, averages, estimates, measurement, graphic representation, and practical geometry and trigonometry.

**i-Pathways Alignment with the Statewide TDL Curriculum:** The lessons identified in this document have connections with both i-Pathways and the intended learning objectives identified in the statewide Transportation, Distribution and Logistics Curriculum. The i-Pathways lessons can be used to build background knowledge, reinforce content, or provide learners with additional practice in a specific skill development.

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**Learning Outcomes**

**Students will:**

- Complete a self-assessment to determine their level of math anxiety
- Develop and utilize successful study strategies in mathematics
- Solve TDL contextualized whole number, fraction, and decimal problems accurately
- Use the order of operations to accurately solve problems in the TDL workplace
- Solve TDL contextualized ratio and proportion problems involving unit rates, time, distance, and measurements
- Solve TDL contextualized problems with percents, averages and estimates
- Find the mean, median, mode, and range in a set of numbers
- Interpret graphic representations of data from TDL work settings
- Use equations to set-up and solve TDL contextualized algebra problems accurately
- Use formulas to solve TDL contextualized geometry problems accurately
- Utilize calculator functions to correctly solve TDL math problems

**Methods of Instruction**

- Teacher modeling, direct instruction, and facilitation of learning
- Skills practice, including technology-based practice
- Individual and group work

**Methods for Evaluating Student Performance**

- Student demonstration
- Teacher observation
- Examinations

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**Module Overview**

    A.  Study Skills for Mathematics
    B.  Whole Number Review
    C.  Fractions
    D.  Decimal fractions
    E.  Ratios and Proportions
    F.  Percents, Averages, and Estimates
    G.  Percent Increase and Decrease
    H.  Exponents and Roots with Order of Operations
    I.  Basic Measurements
    J.  Interpreting Graphic Data
    K.  Formulas and Equations
    L.  Practical Geometry

# Module Outline

1. Study skills in math
    a. Math anxiety inventory diagnostic test
    b. Designing personal success strategy in math

2. Whole numbers review in the TDL context
    a. Integers, absolute value, inequality
    b. Addition
    c. Subtraction
    d. Multiplication and division
    e. Order of operations

3. Fractions in the context of the TDL workplace
    a. Fractions and equivalent fractions
    b. Factors and lowest terms
    c. Fractions on the graphing calculator
    d. Multiplication and division – area and volume
    e. Addition and subtraction of like fractions and least common denominators
    f.  Addition and subtraction of unlike fractions – perimeter
    g. Complex fractions
    h. Order of operations
    i. Conversions between improper fractions and mixed numbers

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4. Decimal fractions
    a. Significant digits
    b. Rounding
    c. Addition of decimal fractions
    d. Subtraction of decimal fractions
    e. Multiplication of decimal fractions
    f.  Division of decimal fractions
    g. Decimal and common fraction equivalents

5. Ratios and Proportions in the TDL context
    a. Ratios, rates, and unit rates
    b. Proportions

6. Percents, averages and estimates in the TDL context
    a. Simple interest
    b. Discount calculations
    c. Computation of averages
    d. Determining estimates

7. Percent proportions
    a. Increasing percents
    b. Decreasing percents

8. Exponents and roots with order of operations in applied settings
    a. Roots
    b. Combined operations of exponents and roots

9. TDL applications of basic measurements
    a. Length and angle of measurement
    b. Volume
    c. Weight and mass
    d. Work
    e. Energy
    f. Time
    g. Distance

10. Graphic representation of data from TDL work settings
    a. Line graphs
    b. Pie graphs
    c. Bar and stacked bar graphs

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11. Formulas and equations
    a. Representing data in formulas and equations
    b. Solving equations of TDL-related problems
    c. Formulas commonly used in TDL settings

12. Practical geometry
    a. Review of volume including cubes, rectangular solids, and cylinders
    a. Pythagorean Theorem, including distance between points on a map