PLANNED INSTRUCTION

A PLANNED COURSE FOR:

Vocational Math

Curriculum writing committee:

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Grade Level:

11

Date of Board Approval: ____2021_____

Vocational Math Grading Policy Target Points

	Marking Period 1	Marking Period 2	Marking Period 3	Marking Period 4	Total
Total Points	**450**	**450**	**450**	**550**	**100%**
Tests	**200**	**200**	**200**	**200**	**42%**
Quizzes	**100**	**100**	**100**	**100**	**21%**
Projects	**100**	**100**	**100**	**100**	**21%**
Classwork/Homework	**50**	**50**	**50**	**50**	**11%**
Final Exam				**100**	**5%**

Curriculum Map

Overview:

This course follows Foundations of Algebra. This comprehensive, research, and standards-based course is designed to further develop the student's mathematical and analytical knowledge in the core vocational areas. The Vocational and Technical Mathematics course is designed to incorporate daily mathematics used in the everyday workplace. The course will include mathematical skills that have been researched to enhance and apply to post-secondary education, training, or employment. Topics include arithmetic, algebraic reasoning, data analysis, and real world problem solving.

Time/Credit for the Course: 2 semesters 1 credit, 180 days, meeting 1 period per day

Goals:

1. Students will be able to determine measures of central tendency and variability.
2. Students will be able to read, analyze, and interpret data from a graph, table, or chart.
3. Students will be able to identify independent and dependent variables.
4. Students will be able to apply algebra skills and knowledge to solve real world problems.
5. Students will be able to determine theoretical and experimental probabilities.
6. Students will be able to write, read, and graph equations.
7. Students will be able to effectively manage resources to attain personal financial goals.
8. Students will be able to effectively analyze and evaluate different financial tools.
9. Students will be able to analyze data about career options and salaries.
10. Students will be able to identify different skills needed to be successful in the career search process.

Unit #1

- Measure of Central Tendency
- Conversion and understanding of relationships between percentages, decimals, and fractions
- Calculating discounts, taxes, and tips
- Identifying the use of percentages in real world settings
- Read, analyze, interpret data from a graph, table, or chart

Unit #2

- Independent and dependent variables
- Writing and graphing equations based on independent and dependent variables
- Theoretical and experimental probabilities
- Simple and compound probabilities
- Relations and Functions
- Linear Functions (graphically and algebraically)
- Systems of Linear equations and inequalities

Unit #3

- Understanding pay and benefits
- Calculating gross pay
- Paycheck deductions
- Understanding your paycheck
- Reading and understanding a pay stub
- Understanding different employment benefits
- Understanding employment forms (W-4 and I-9)
- Writing checks and making deposits
- Checking and savings accounts

Unit #4

- Personal Financial Goals
- Budgeting and planning
- Creating a budget
- Budgeting for a Large Purchase
- Career Exploration and Salary
- Budgeting based on a Specific Career
- Employment Search Strategies
- Employee Rights
- Job Interview Skills

Big Ideas:
Big Idea #1: Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations.
Big Idea #2: Numerical measures describe the center and spread of numerical data.
Big Idea #3: There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.
Big Idea #4: Being able to apply ideas and knowledge of algebraic problem solving will allow students to solve real world problems.
Big Idea #5: Responsible consumers use effective resource management to accomplish personal financial goals.
Big Idea #6: Responsible consumers analyze and evaluate different financial tools to accomplish personal financial goals.
Big Idea #7: Being knowledgeable about the rights and responsibilities of employers will lead to more successful job placement and higher earning potential.

Textbook and Supplemental Resources:
Algebra 1 Common Core by Pearson Education, Inc. (2012)
Textbook Online Resources
Teacher Generated Worksheets (Kuta Software)
Mathematics for Technical and Vocational Students 10^{th} Edition
Textbook Resources
Teacher Generated Worksheet

Curriculum Plan

Unit #1 **Time/Days: 45 Days**

- **Standards (by number):**
  http://static.pdesas.org/content/documents/PA%20Core%20Standards%20Mathematics%20PreK-12%20March%202014.pdf
  CC.2.4.HS.B.1, DD.2.4.HS.B.5, CC.2.4.HS.B.6, CC.2.4.HS.B.7, CC.2.4.HS.F.3, CC.2.4.HS.B.2, CC.2.4.HS.B.3, CC.2.2.HS.C.1, CC.2.2.HS.C.2, CC.2.2.HS.C.3, CC.2.2.HS.C.6, CC.2.2.HS.D.7, CC.2.2.HS.D.9, CC.2.2.HS.D.10, CC.2.2.HS.F.4

- **Anchors:**
  A.1.1.2.1 A.1,1.1.3, A1.2.1.1, A1.2.1.2, A1.2.2.1, A1.2.2.2, A1.2.3.1, A1.2.3.2, A1.2.3.3

- **Eligible Content:**
  - Measure of Central Tendency
  - Conversion and understanding of relationships between percentages, decimals, and fractions
  - Calculating discounts, taxes, and tips
  - Identifying the use of percentages in real world settings
  - Read, analyze, interpret data from a graph, table, or chart

Objectives:

1. Students will be able to determine mean, median, mode and range. (DOK – 2)
2. Students will be able to convert percentages, decimals, and fractions. (DOK – 1)
3. Students will be able to identify all components of various data displays, such as but not limited to graphs, tables, and charts. (DOK –1)
4. Students will be able to analyze and interpret data based on graphs, tables, and charts (DOK - 3)
5. Students will be able to identify and represent patterns that describe linear functions. (DOK – 2)
6. Students will be able to make and interpret frequency tables and histograms (DOK -2)
7. Students will be able to create and interpret box-and-whisker plots as well as find quartiles and percentiles (DOK – 3)

Core Activities and Corresponding Instructional Methods:

1. Warm-ups: Review of Algebra topics, including solving equations and inequalities, absolute value, graphing inequalities, and the coordinate system.
2. Students will complete an activity to develop understanding of mean, median, mode, and range. Students will analyze their individual data, partner's data, and the whole class data.
3. Students will complete various practice problems to ensure understanding of the skill. (Pearson Algebra Textbook - pages 738-741)
4. Students will complete an activity requiring them to translate a picture (shaded shapes) to a fraction, decimal, and percentage.
5. Students will complete a task card activity to solve ratios and proportions.
6. Real-life scenarios (word problems) to connect rates, ratios, percentages, decimals, and fractions to real work situations. (Pearson - Algebra Textbook - pages 116-120)
7. Utilizing a series of menus, flyers, and sales advertisements to calculate tax, tips, and discounts.
8. Utilize different graphs, tables, and charts to analyze and interpret the data being presented.
9. Complete activity based on the percentage of colors of M and M's in a bag. Students will create a stem and leaf plot, and circle graph based on the data collected.

Assessments:

- **Diagnostic:**
  Teacher prepared pre-test/diagnostic test
  Teacher questioning and observation
- **Formative:**
  Teacher observations, questions, discussions
  Teacher assigned homework
  Teacher prepared assessments (quizzes and graded assignments)
  Warm Ups
- **Summative:**
  Teacher prepared summative tests

Unit #2 **Time/Days: 45 Days**

- **Standards (by number):**
  http://static.pdesas.org/content/documents/PA%20Core%20Standards%20Mathematics%20PreK-12%20March%202014.pdf
  CC.2.4.HS.B.1, DD.2.4.HS.B.5, CC.2.4.HS.B.6, CC.2.4.HS.B.7, CC.2.4.HS.F.3, CC.2.4.HS.B.2, CC.2.4.HS.B.3, CC.2.2.HS.C.1, CC.2.2.HS.C.2, CC.2.2.HS.C.3, CC.2.2.HS.C.6, CC.2.2.HS.D.7, CC.2.2.HS.D.9, CC.2.2.HS.D.10, CC.2.2.HS.F.4

- **Anchors:**
  A.1.1.2.1 A.1,1.1.3, A1.2.1.1, A1.2.1.2, A1.2.2.1, A1.2.2.2, A1.2.3.1, A1.2.3.2, A1.2.3.3

- **Eligible Content:**
  - Independent and dependent variables
  - Theoretical and experimental probabilities
  - Simple and compound probabilities
  - Scatter Plots and Trend lines
  - Relations and Functions
  - Writing and graphing equations based on independent and dependent variables
  - Linear Functions (graphically and algebraically)
  - Systems of Linear equations and inequalities

Objectives:

1. Students will be able to identify independent and dependent variables. (DOK – 1)
2. Students will be able to determine theoretical and experimental probabilities. (DOK – 3)
3. Students will be able to find the probabilities of mutually exclusive and overlapping events as well as independent and dependent events (DOK- 3)
4. Students will be able to find rates of change from tables; they will be able to calculate slope. The will also compare slopes of parallel lines (DOK – 3)
5. Students will be able to write and graph linear equations in slope-intercept form, point-slope form, and standard form. (DOK – 2)
6. Students will be able to write an equation of a trend line and line of best fit as well as use the trend line or line of best fit to make predictions (DOK – 4)
7. Students will be able to solve a system of linear equations by graphing, using substitution, or using the elimination method. (DOK – 2)
8. Students will be able to apply their understanding of systems of equations to solve real world problems. (DOK – 4)
9. Students will be able to graph linear inequalities in two variables and use linear inequalities to model real world situations. (DOK – 3)
10. Students will be able to solve a system of linear inequalities by graphing and modeling real world situations using a system of linear inequalities. (DOK – 3)

Core Activities and Corresponding Instructional Methods:

1. Warm-ups: Review of Algebra topics, including solving equations and inequalities, absolute value, graphing inequalities, and the coordinate system.
2. Students will complete activities that help them to develop an understanding of dependent and independent variables. Activities utilizing sorting dependent and independent events and matching dependent and independent variables. (Pearson - Algebra Textbook page 240)
3. Activities using standard die, deck of cards, spinners, and other manipulatives for students to understand and explore simple probability. (Pearson - Algebra Textbook page 769-775)
4. Activities using standard die, decks of cards, spinners, and other manipulatives for students to understand and explore compound probability. (Pearson - Algebra Textbook page 776-782)
5. Students will complete a Mad-Lib using compound probability. Students will solve compound probability problems and use their answers to create a mad-lib.
6. Students will add trend lines and analyze what the trend lines mean on graphs. (Pearson - Algebra Textbook page 336-337)
7. Students will use tables, graphs, and data sets to determine if the data is a function.
8. Students will be able to identify slope when given a graph, equation, or table. (Pearson - Algebra Textbook page 294-299)
9. Graphing activity that requires them to graph a line through specific objects.
10. Using an inquiry based activity, students will find solutions to systems of equations.
11. Completion of a systems of equations flip book to complete sample problems in how to solve systems of equations using substitution, elimination, and graphing.
12. Complete real world problems that use systems of equations to find the solutions.

Assessments:

- **Diagnostic:**
  Teacher prepared pre-test/diagnostic test
  Teacher questioning and observation
- **Formative:**
  Teacher observations, questions, discussions
  Teacher assigned homework
  Teacher prepared assessments (quizzes and graded assignments)
  Warm Ups
- **Summative:**
  Teacher prepared summative tests

Unit #3 **Time/Days: 45 Days**

- **Standards (by number):**
  http://static.pdesas.org/content/documents/PA%20Core%20Standards%20Mathematics%20PreK-12%20March%202014.pdf
  CC.2.1.HS.F.2, CC.2.1.HS.F.3, CC.2.1.HS.F.4, CC.2.1.HS.F.6, CC.2.4.HS.B.3, 13.1.11., 13.2.11., 13.3.11.

- **Anchors:**
  A1.1.2.1.1, A1.1.2.1.2, A1.1.2.1.3, A1.2.1.2.1, A1.2.1.2.2, A2.2.2.1.1, A2.2.2.1.2, A2.2.3.1.1, A2.2.3.1.2

- **Eligible Content:**
  - Understanding pay and benefits
  - Calculating gross pay
  - Paycheck deductions
  - Understanding your paycheck
  - Reading and understanding a pay stub
  - Understanding different employment benefits
  - Understanding employment forms (W-4 and I-9)
  - Writing checks and making deposits
  - Checking and savings accounts

Objectives:

1. Students will be able to calculate gross pay. (DOK -1)
2. Students will be able to calculate payroll deductions. (DOK-1)
3. Students will be able to identify the different benefits that employers may offer and the importance of each benefit. (DOK -2).
4. Students will be able to read and interpret a pay stub. (DOK - 2).
5. Students will be able to read and complete a W-4 and I-9 form. (DOK-2)
6. Students will research and analyze different employment benefits offered at a variety of employers. (DOK-4)
7. Students will be able to identify the parts of a check and checkbook register. (DOK-1)
8. Students will be able to fill out a check and a deposit slip. (DOK-2)
9. Students will be able to complete the process of paying bills and completing deposits when given a real life scenario. (DOK-3)
10. Students will be able to research and analyze the effects of overdrawing an account (DOK-4).

Core Activities and Corresponding Instructional Methods:

1. Warm-ups: Review of Algebra topics, including solving equations and inequalities, absolute value, graphing inequalities, and the coordinate system.
2. Given a real life scenario, students will calculate gross pay.
3. Given a real life scenario, students will be able to calculate payroll deductions.
4. Complete a payroll project in which they have to calculate their gross pay, deductions, fill out a timecard, and calculate their net pay.
5. Identify and complete the different parts of a W-4 and I-9 form.
6. Research different employment benefits offered at various employers and identify the importance of each.
7. Identify the parts of a check and a checkbook register.
8. Compare and contrast the different benefits of different banks and types of bank accounts using a bank comparison project.
9. Given a real life scenario, students will complete a checking account project where they are responsible for paying bills, making deposits, and writing checks.
10. Students will research the penalties that occur at multiple banks when they overdraw their account.
11. Identify different types of insurance and what they are used for. (DOK - 1)
12. Compare and analyze different options when purchasing insurance (ie. tort). (DOK - 3)

Assessments:

- **Diagnostic:**
  Teacher prepared pre-test/diagnostic test
  Teacher questioning and observation
- **Formative:**
  Teacher observations, questions, discussions
  Teacher assigned homework
  Teacher prepared assessments (quizzes and graded assignments)
  Warm Ups
- **Summative:**
  Teacher prepared summative tests

Unit #4 **Time/Days: 45 Days**

- **Standards (by number):**
  http://static.pdesas.org/content/documents/PA%20Core%20Standards%20Mathematics%20PreK-12%20March%202014.pdf
  CC.2.1.HS.F.2, CC.2.1.HS.F.3, CC.2.1.HS.F.4, CC.2.1.HS.F.6, CC.2.4.HS.B.3, 13.1.11., 13.2.11., 13.3.11.

- **Anchors:**
  A1.1.2.1.1, A1.1.2.1.2, A1.1.2.1.3, A1.2.1.2.1, A1.2.1.2.2, A2.2.2.1.1, A2.2.2.1.2, A2.2.3.1.1, A2.2.3.1.2

- **Eligible Content:**
  - Personal Financial Goals
  - Budgeting and planning
  - Creating a budget
  - Budgeting for a Large Purchase
  - Career Exploration and Salary
  - Budgeting based on a Specific Career
  - Employment Search Strategies
  - Employee Rights
  - Job Interview Skills

Objectives:

1. Students will be able to identify and set financial goals. (DOK - 2)
2. Students will be able to create a budget for a predetermined period of time (DOK - 2)
3. Students will be able to create a budget plan for making a large purchase. (DOK- 3)
4. Students will be able to analyze the correlation between education/training and salary. (DOK - 3)
5. Students will be able to create a budget based on a career choice and lifestyle choices. (DOK - 2)
6. Students will be able to utilize different sources to find employment in a field that they are interested in working. (DOK - 2)
7. Students will be able to identify different rights of employees (DOK -1)
8. Students will be able to answer interview questions about themselves. (DOK-2)
9. Students will be able to identify and answer illegal interview questions. (DOK - 2)

Core Activities and Corresponding Instructional Methods:

1. Warm-ups: Review of Algebra topics, including solving equations and inequalities, absolute value, graphing inequalities, and the coordinate system.
2. Complete activities that show understanding of financial literacy concepts and vocabulary. (Personal Literacy Book - Chapter 3 - Financial Decisions and Goals).
3. Complete activities that demonstrate understanding of the steps in creating a budget and the steps needed to plan for a budget (Personal Literacy Book - Chapter 3 - Financial Literacy Goals)
4. Complete an activity that requires students to research the cost of a specific car and determine the monthly payments based on different scenarios.
5. Complete an activity that requires students to plan a vacation using a budget and completing certain activities during the vacation.
6. Research and analyze the amount of education/training required for specific jobs. Students will utilize www. educationplanner.org to explore the different educational levels and annual salary.
7. Research and create a budget based on a job that they are interested in and a series of questions using the website https://www.pacareerzone.org.
8. Complete a webquest to find information about the EEOC and different laws that support employees' rights.
9. Research and identify different illegal interview questions and how to appropriately answer those questions when in an interview.

Assessments:

- **Diagnostic:**
  Teacher prepared pre-test/diagnostic test
  Teacher questioning and observation
- **Formative:**
  Teacher observations, questions, discussions
  Teacher assigned homework
  Teacher prepared assessments (quizzes and graded assignments)
  Warm Ups
- **Summative:**
  Teacher prepared summative tests