Transitional Math Syllabus

Quantitative Literacy/Statistics Pathway

Course Information

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| Course Name | Mathematical Literacy 099 |
| Course Pathway | High School Transitional Math 4 – Quantitative Literacy and Statistics  |
| ISBE SIS Code | 02201A001 |
| Portability Code  | TM002 |
| Course Duration | 1 Semester (18 Weeks- 5 Days/week) |

Contact Information

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| School Name | Washington Community High School |
| Community College Name | Illinois Central College |

Course Description

Math course framework designed to prepare and transition students directly into college and career pathways requiring general education college level math competencies in quantitative literacy and statistics. The competencies within each domain should include but are not limited to: numeracy (operation sense, estimation, measurement, quantitative reasoning, basic statistics, and mathematical summaries), application based algebraic topics, and functions and modeling. Upon completion students should be able to: demonstrate proficiency and understanding in basic numeracy competencies in whole numbers, integers, fractions, and decimals, use estimation and explain/justify estimates, apply quantitative reasoning to solve problems involving quantities or rates, use mathematical summaries of data such as mean, median, and mode, use and apply algebraic reasoning as one of multiple problem-solving tools, and use functions and modeling processes. Course to be delivered through authentic application, problem-based instruction designed to build mathematical conceptual understanding and critical thinking skills.

Evaluation

Grades in this course are based on the following:

40% Exams

25% Projects

20% Homework

15% Final Exam

No credit will be given for late work.

Grade Scale

A 100.00 - 93.00

A- 92.99 - 89.50

B+ 89.49 - 87.00

B 86.99 - 83.00

B- 82.99 - 79.50

C+ 79.49 - 77.00

C 76.99 - 73.00

C- 72.99 - 69.50

D+ 69.49 - 67.00

D 66.99 - 63.00

D- 62.99 - 59.50

F 59.49 - 0.00

Course Materials

Textbook: Pathways to Literacy: Second Edition. Sobecki & Mercer. McGraw Hill, 2019.

ISBN: 978-1-260-40493-7

Students will need a notebook, calculator, access to spreadsheets, access to the internet outside of class, and access to IXL for some additional homework assignments

Course Units of Study

Unit 1: Organizing and Visualizing Numeric Data (18 Days)
Percentages, Pie Charts, and Bar Graphs, Using Addition and Subtraction Skills, Using Multiplication and Division Skills, Using Exponents and Order of Operation, The Basics of Graphing, Basic Probability, Using Scientific Notation, Organizing Information with Venn Diagrams, Gathering and Organizing Data

Unit 2: Making Sense of It All (12 Days)
Using Measures of Average, Inputs, Outputs, and Interpreting Expressions, Working with Units and Formulas, Dimensional Analysis, Estimation and Number Sense, Interpreting Relative Change/Percent Error

Unit 3: Thinking Linearly (20 Days)
Slope as a Rate of Change, Writing, Interpreting, and Evaluating Algebraic Expressions, Solving Equations, Solving Inequalities, Solving Problems Numerically and Algebraically, Direct Variation and Proportions, Direct Variation and Proportions, Point-Slope Form and Linear Modeling, Linear Relationships and Lines of Best Fit, Problems with Systems of Equations

Unit 4: Living in a Nonlinear World (24 Days)
The Pythagorean Theorem and Distance, Exponential Growth Graphs of Quadratic Equations, Add, Subtract, and Multiply Expressions, Factoring, The Quadratic Formula and Max/Min, Quadratic Curve Fitting

Process Competencies

Transitional courses are intended to help students develop conceptual understanding and problem-solving ability as well as college and career readiness. To that end, the courses include process competencies related to mathematical and student success. While these competencies are not assessed directly, they should be a part of instruction and assessed indirectly. See page 6 in the *Competencies and Policies Document* at www.iltransitionalmath.org for more information.

Data Modeling supports student development of conceptual understanding and problem solving ability as well as college and career readiness through utilization of the Common Core Standards for Mathematical Practice. Students gain background knowledge by working through IXL modules. Then students are required to make sense of problems and persevere in solving them, reason abstractly and quantitatively, and construct viable arguments and critique the reasoning of others throughout all four units. A specific example includes the 3-6 Modeling Data Using Linear Functions unit project which requires students to reason abstractly and quantitatively by determining the line of best fit for student selected data. Students then justify their groups work, demonstrate critical thinking by analyzing and critiquing the reasoning of others before and after student presentations. Students will use appropriate modes of technology (calculators, spreadsheets, and tablets/computers) throughout all units. See Sample worksheet #1 below. Throughout the course students will be thinking about different patterns in data and how that applies to many real world data sets. They will need to analyze the patterns they see to be able to pick an appropriate model. Information is presented using tables, graphs, words, and equations and students learn to move from one mode of presentations to another. As they discuss the meaning in context, students will need to make decisions about what makes sense in the context of the data.

Problem/Project-based Learning

Transitional math instruction provides students with the mathematical knowledge and skills to meet their individualized college and career goals and to be successful in college-level math courses, while aligning with the Illinois Learning Standards. These courses work to address the gaps in understanding by working on bigger problems, emphasizing problem-based learning and projects, communication, and integration of concepts, not just skill acquisition. Contexts used should be authentic whenever possible and apply to the student’s college or career path.

Projects are offered throughout the textbook and supplemented with the following websites:

<http://www.mathalicious.com/>

<https://ioer.ilsharedlearning.org/Library/5591/PWR_Transitional_Math>

<https://www.sreb.org/math-ready>

<https://www.map.mathshell.org/>

<https://teacher.desmos.com/>

Comparing Fuel Consumption Sample #2
<https://www.map.mathshell.org/download.php?fileid=1674>

Sample worksheet #1, where an Excel spreadsheet is utilized to solve each problem. The spreadsheet is manipulated slightly and amended for each different problem. The spreadsheet is finally amended in such a way that it becomes user friendly for anyone needing to input different rates, times, and increases.

Unit 3 Rituxan Infusion Name(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_

1. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 25 mL/Hr for the first 30 minutes and then increase 12.5 mL/Hr every 30 minutes thereafter. How long will it take to empty the bag?

2. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 25 mL/Hr for the first 60 minutes and then increase 12.5 mL/Hr every 60 minutes thereafter. How long will it take to empty the bag?

3. 2000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 25 mL/Hr for the first 30 minutes and then increase 12.5 mL/Hr every 30 minutes thereafter. How long will it take to empty the bag?

4. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 50 mL/Hr for the first 30 minutes and then increase 25 mL/Hr every 30 minutes thereafter. How long will it take to empty the bag?

5. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 25 mL/Hr for the first 30 minutes and then increase 12.5 mL/Hr every 30 minutes thereafter. Once the patient reaches the 100 mL/Hr rate, the rate will not increase any more. How long will it take to empty the bag?

6. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 10 mL/Hr for the first 30 minutes and then increase 10 mL/Hr every 30 minutes thereafter. How long will it take to empty the bag?

7. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 10 mL/Hr for the first 30 minutes and then increase 10 mL/Hr every 60 minutes thereafter. How long will it take to empty the bag?

8. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 100 mL/Hr for the first 30 minutes and then increase 20 mL/Hr every 30 minutes thereafter. How long will it take to empty the bag?

9. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 25 mL/Hr for the first 30 minutes and then increase 12.5 mL/Hr every 30 minutes thereafter. However, the nurse forgets to increase the rate. The patient is stuck at 12.5 mL/Hr for the entire time. How long will it take to empty the bag?

10. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 25 mL/Hr for the first 30 minutes and then increase 12.5 mL/Hr every 30 minutes thereafter. However, the nurse forgets to increase the rate. The patient is stuck at 12.5 mL/Hr for the first hour and then the nurse increased the dose as planned. How long will it take to empty the bag?

11. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 25 mL/Hr for the first 30 minutes and then increase 12.5 mL/Hr every 30 minutes thereafter. The patient begins vomiting two hours and 10 minutes into the treatment. Therefore, the nurse must maintain the current rate until the bag is empty. How long will it take to empty the bag?

12. 1000 mL of Rituxan is to be infused into a patient’s IV over time. The patient will receive 25 mL/Hr for the first 30 minutes and then increase 12.5 mL/Hr every 30 minutes thereafter. The nurse misreads the directions and increases the rate 125 mL/Hr every 30 minutes. How long will it take to empty the bag?