

QW2 Lesson Outline

Module 5: QR Toolkit

(Ten 40-minute periods)

	Topic	Theme	Tools and Technology	Lesson Length
5.1	Numbers, Numbers, Everywhere Main Math Topic: Quantitative Reasoning as a skill Main Quantitative Reasoning Context: the importance of Quantitative Reasoning	Introduction	None are needed.	40 minutes
5.2	Millions, Billions, or Trillions? Main Math Topic: Estimating with large numbers Main Quantitative Reasoning Context: US National Debt	Social	Calculators	40 minutes
5.3	The Great Pacific Garbage Patch Main Math Topic: Scaling factors and area unit conversion Main Quantitative Reasoning Context: Understanding and critiquing infographics	Environment	Rulers, calculators	40 minutes
5.4	A Trillion Dollars of Student Loans Main Math Topic: Interest rates and estimation Main Quantitative Reasoning Context: Paying off student loans	Financial	Calculators	40 minutes
5.5	Computing and Interpreting Percentages Main Math Topic: Calculating with percentages Main Quantitative Reasoning Context: Various	Health and Risk	Calculators	40 minutes
5.6	Measuring Risk and Changes in Risk Main Math Topic: Absolute and relative change, applied uses of percentages Main Quantitative Reasoning Context: Death and survival rates with cancer screenings and treatment	Health and Risk	Calculators	40 minutes
5.7	Reading a Scientific Study Main Math Topic: Understanding designs of statistical studies Main Quantitative Reasoning Context: Critical reading of press releases of studies	Social	Internet access or copies of prior PNL reading	40 minutes
5.8	Investigating Causes of Homelessness Main Math Topic: Critical analysis of statistical studies Main Quantitative Reasoning Context: Child abuse and its link to homelessness	Social	Calculators	40 minutes
5.9	Measuring Success Main Math Topic: Reading and interpreting visual displays of data Main Quantitative Reasoning Context: Measuring student success in college algebra	Social	Rulers, graph paper, spreadsheet program (optional)	40 minutes
5.10	Media Piracy Review and synthesis of Module 5	Social	Colored pens, markers, pencils, and/or highlighters (Optional)	40 minutes

Module 5 Assessment

Module 6: Statistical Literacy
(Ten 40-minute periods)

	Topic	Theme	Tools and Technology	Lesson Length
6.1	Screening Tools – How Effective Are They? Main Math Topic: Sensitivity and specificity of screening tools Main Quantitative Reasoning Context: PSA screening tool for prostate cancer	Health and Risk	Calculators	40 minutes
6.2	Rising Gasoline Prices Main Math Topic: Spreadsheet functions and data organization; using CPI to compare cost over time Main Quantitative Reasoning Context: Examining the changing cost of gasoline	Environment	Spreadsheet program (i.e., Excel or Google Docs)	40 minutes
6.3	At Risk for Homelessness Main Math Topic: Reading, interpreting, and creating bar and pie charts Main Quantitative Reasoning Context: Visual representations of survey data on homelessness	Social	Spreadsheet program or tools to graph by hand (rulers, compasses or other circle makers), calculators	40 minutes
6.4	A Closer Look at Screening Tools Main Math Topic: Understanding two-way (contingency) tables, determining sensitivity and specificity Main Quantitative Reasoning Context: Quantifying the effectiveness of cancer screening tools	Health and Risk	Calculators	40 minutes
6.5	Tax Targets Main Math Topic: Reading and creating statistical graphs of quantitative data, including histograms Main Quantitative Reasoning Context: Income distribution and tax rates in the US	Social	Tools for creating graphs by hand, or spreadsheet program (optional)	80 minutes (i.e. 2 days)
6.6	Average Expectations Main Math Topic: Measures of central tendency, data distribution Main Quantitative Reasoning Context: Student loan debt, starting salaries, and income distribution	Financial	Calculators, spreadsheets (optional)	40 minutes
6.7	Weighted Averages Main Math Topic: Weighted averages Main Quantitative Reasoning Context: GPAs, scholarships, and paying for college	Financial	Calculators	40 minutes
6.8	Rising Temperatures Across the United States Main Math Topic: Standard deviation Main Quantitative Reasoning Context: Climate change	Environment	Spreadsheet software and access to the accompanying spreadsheet data of temperatures	40 minutes
6.9	Gender Differences in Science and Math Review and synthesis of Module 6	Social	Color copies of graphs and/or a way to project the color copies on a screen for students	40 minutes

Module 6 Assessment

Module 7: Introduction to Mathematical Modeling

(Ten 40-minute periods)

	Topic	Theme	Tools and Technology	Lesson Length
7.1	Introduction to Mathematical Models, Equations, and Variables Main Math Topic: Mathematical Models Main Quantitative Reasoning Context: Ranking systems	Social	Calculator for in-class. Spreadsheet program would be helpful for OCE questions.	40 minutes
7.2	Overview of Linear Models Main Math Topic: Linear models, with words, tables, graphs, and equations Main Quantitative Reasoning Context: Energy bills in summer and winter cycles	Financial	One ruler for each group	40 minutes
7.3	Four Equations... Two Models Main Math Topic: Linear models, piecewise linear models, solving for points of intersection Main Quantitative Reasoning Context: Moving van rentals	Financial	Tools for graphing, calculators	80 minutes (i.e. 2 days)
7.4	Linear Trends Main Math Topic: Approximating data with linear models Main Quantitative Reasoning Context: Obesity and climate change	Health and Social	Calculators, spreadsheets, graphing tools	80 minutes (i.e. 2 days)
7.5	Remembering Exponential Models Main Math Topic: Exponential models Main Quantitative Reasoning Context: Various	Social	Calculators, tools for graphing	40 minutes
7.6	Social Security for Me Main Math Topic: Modeling situations with exponential equations Main Quantitative Reasoning Context: Social Security Trust Fund	Financial	Calculators, spreadsheets, graphing tools	40 minutes
7.7	There's No Place Like Home Review and Synthesis of Module 7 Module 7 Assessment	Financial	Calculators and spreadsheet software	40 minutes

Module 8: Advanced Modeling*
(Six 40-minute periods)

	Topic	Theme	Tools and Technology	Lesson Length
8.1	BMI and Health Numbers Main Math Topic: Multivariable models Main Quantitative Reasoning Context: Health indicators	Health	Calculators and spreadsheet software	40 minutes
8.2	400 Guilders Becomes a Billion Main Math Topic: Modeling money growth Main Quantitative Reasoning Context: National Debt	Financial	Calculators and spreadsheet software	40 minutes
8.3	Modeling Car Loan Payments Main Math Topic: Using multivariable models within technology tools Main Quantitative Reasoning Context: Loan payments	Financial	Calculators and spreadsheet software	40 minutes
8.4	Is it Predictable? Main Math Topic: Non-linear and non-exponential models Main Quantitative Reasoning Context: Personal spending, weather, and learning curves	Financial, Health, and Social	Calculators and spreadsheet software	40 minutes
8.5	A Return to Gun Violence Review and synthesis of Quantway™	Social	Calculators and spreadsheet software	80 minutes (i.e. 2 days)
Module 8 Assessment				

** Module 8 is optional. Lessons may be replaced with lessons to meet local learning goals.*