Supporting the Underprepared Student
Foundations of Mathematical Reasoning

Students in a regular Foundations of Mathematical Reasoning class will complete preview assignments prior to coming to class. These reviews will prepare them to successfully engage with the in-class activities. Students in the co-requisite class will complete worksheets during the support class that will enable them to go home and successfully complete the Preview Assignment on their own.

Lesson Number	Co-Requisite Worksheet Content	Preview Assignment Content	In-Class Activity Content
1A	Understanding the base-ten place value system	There is no Preview Assignment for this lesson.	Quantitative reasoning with large numbers
1B	There is no co-requisite Worksheet for this lesson.	There is no Preview Assignment for this lesson.	Student success focus (learning community)
1C	Performing basic unit conversion (US customary system)	There is no Preview Assignment for this lesson.	Quantitative reasoning with large numbers
1D	There is no co-requisite Worksheet for this lesson.	There is no Preview Assignment for this lesson.	Student success focus (learning community)
2A	Understanding signed values, doubling numbers, translating number-word combinations	Doubling numbers, understanding number-word combinations, reading timelines	Comparing large numbers, doubling numbers, understanding rates; Introduction to note taking
2B	Rounding, writing powers of ten in exponential form	Rounding, writing powers of ten in exponential form, multiplying by powers of ten	Representing numbers in scientific notation, converting back to standard notation
2C	Writing ratios, converting fractions to decimals and percentages	Writing ratios as fractions and decimals, converting between fractions, decimals and percentages, dividing by powers of ten	Comparing large numbers, writing and estimating ratios, representing numbers in scientific notation
2D	Writing ratios and unit rates	Understanding and calculating per capita amounts	Representing numbers in scientific notation, writing and interpreting ratios

Lesson Number	Co-Requisite Worksheet Content	Preview Assignment Content	In-Class Activity Content
3A	Comparing ways of presenting numerical data (total amount vs. rate) and supporting arguments with data	Analyzing how data is presented in the media	Identifying misinformation, strategies for testing information
3B	Student success focus (seeking help), reviewing place value, fractions and percentages	Student success focus (seeking help)	Student success focus (campus resources, seeking and offering help)
3C	Converting percentages to fractions and decimals, misconceptions about percentages	Understanding percent, converting between fractions, decimals, and percentages	Estimating values, converting fractions to benchmark percentages
3D	Converting percentages to fractions and decimals	Converting percentages to fractions and decimals	Determining when an estimate or an exact calculation is more appropriate, calculating percentages
3E	There is no co-requisite Worksheet for this lesson.	Student success focus (self-regulation)	Student success focus (self-regulation)
4A	Reading pie charts	Creating pie charts, equivalence of numerical expressions	Using order of operations and pie charts to develop a budget
4B	Reading data tables	Understanding spreadsheet labeling conventions	Using spreadsheet formulas to support algebraic reasoning
4C	Reading line graphs, understanding relative change	Creating line graphs, understanding relative change, calculating percentages	Introduction to visual displays, identifying misleading scale, identifying relative change over time
4D	Reading bar graphs	Creating bar graphs, determining whether a graph contains sufficient information to draw certain conclusions	Comparing size and making estimations using graphical data
5A	Reading stem-and-leaf plots	Labeling place value in large numbers and numbers near zero	Using Stem-and-leaf plots for back-to-back comparison
5B	Reading frequency tables	Converting fractions to percentages	Constructing and analyzing frequency tables, relative frequency, cumulative frequency

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Lesson Number	Co-Requisite Worksheet Content	Preview Assignment Content	In-Class Activity Content
5C	Reading histograms	Reading histograms	Converting frequency tables into histograms; optional data display project
5D	Reading dotplots	Reading visual displays	Describing the shapes of distributions given as dotplots
6A	Calculating mean, median and mode	Calculating the mean, median, and mode using technology	Calculating mean, median, mode, drawing conclusions from statistical summaries, creating data sets to meet criteria
6B	Calculating measures of central tendency	Student success focus (strategies for learning new information)	Student success focus (how the brain learns)
6C	Comparing measures of central tendency	Calculating mean, median, and mode from line graphs or a from a set of numerical data	Making decisions using statistical summaries
6D	Reading boxplots and finding the 5-number summary	Finding the range of a data set or visual display	Analyzing a data set via 5-number summary and boxplots
7A	Understanding credit card holder agreements and disclosure statements	Reading credit card disclosure summaries	Reading strategies to understand financial information
7B	Practicing scientific notation, percentages, and averages	Using large numbers, estimating percentages, following order of operations, understanding credit card debt	Estimating and calculating credit card interest
7C	Understanding profit, return on investment, gross and net earnings, and taxes	Calculate net earnings, return on investment, Social Security and Medicare taxes	Understanding and completing tax forms
7D	Calculate profit, quarterly taxes	Estimating percentages, gross and net earnings, self-employment taxes	Converting tax instructions into mathematical expressions

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8A	Converting fractions and decimals, calculating a percent of a percent	Absolute and relative measures, ratios as division, calculating percent off a value	Absolute and relative measures of risk, comparing fraction and decimal forms of values
8B	Calculating percentages of large values, evaluating risk	Measuring risk, percentages, percent decrease, repeated percent decrease	Evaluating measures of risk
8C	Calculating probability, chance, and likelihood	Calculating percentages and interpreting them as the probability of an event	Interpreting percentages related to a risk reduction scenario
8D	Applying probability and percentages to contexts such as games, quality control, and social data	Calculating percentages and interpreting them as the probability of an event	Calculating absolute and relative change, recognizing ambiguity in communicating about change in a quantity
9A	Completing two-way tables, using two-way tables to calculate percentages	Calculating and interpreting percentages, understanding the *100 Thousand Lives Campaign*	Completing two-way tables, recognizing the base of a percentage
9B	Comparing percentages	Calculating and estimating percentages	Interpreting percentages and visual representations of data; analyzing abstract information
9C	Determining percentages from two-way tables	Calculating percentages, interpreting data in a table	Analyzing accuracy in test results presented in two-way tables
9D	Interpreting false-positive and false-negative results from two-way tables	Determining percentages from two-way tables	Interpreting false-positive and false-negative results from two-way tables
10A	Calculating population densities as unit rates	Calculating population densities	Interpreting ratios, unit rates, and proportional reasoning in the context of population density
10B	Performing dimensional analysis involving units of area	Writing unit rates of population density, performing dimensional analysis involving linear units	Scaling shapes, performing dimensional analysis, calculating population density

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10C	Multiplying and dividing by powers of ten	Multiplying and dividing by powers of ten	Using estimation strategies to determine population density; optional spreadsheet use
10D	Calculating trade balance, absolute and relative change	Interpreting negative numbers in context, calculating percentages	Understanding apportionment and the effect of relative change on representation
11A	Calculating the area and perimeter of rectangles, parallelograms, and triangles	Using units of length and area, multiplying of variables	Evaluating expressions and formulas from geometry
11B	Performing area and perimeter calculations with dimensional analysis	Performing area and perimeter calculations with dimensional analysis, determining the result of doubling length dimensions on the area	Evaluating geometric formulas, using multi-step problem solving involving rates and measures to support financial decisions
11C	Calculating volume of rectangular prisms, volume of cylinders	Performing volume calculations with dimensional analysis, multiplication of variables	Using formulas from geometry and perform calculations that involve rates and measures to support financial decisions
12A	Creating conversion factors	Writing unit rates, reducing fractions, creating conversion factors	Performing dimensional analysis
12B	Writing conversion factors and performing dimensional analysis	Multiplying and dividing fractions, solving contextual problems with dimensional analysis	Comparing two unit rates
12C	Applying dimensional analysis to contextual situations	Choosing the appropriate conversion factor for a contextual problem	Solving problems with multiple pieces of information and multiple steps
12D	Using dimensional analysis to calculate future values in a contextual situation	Applying multi-step dimensional analysis to contextual situations	Generalizing a concrete example to an abstract analysis of a system; comparing a car rental scenario to driving personal vehicle scenario
13A	Squaring values and evaluating square roots, evaluating the order of operations with powers and radicals	Evaluating the order of operations, performing length, area, and volume calculations, and evaluating square roots	Evaluating complicated unfamiliar formulas involving square roots (optional physical activity)

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13B	Simplifying an expression involving units (rather than numbers) using correct order of operations	Calculating grade, pitch; evaluating compound fractions; simplifying fractions involving units (rather than numbers)	Understanding and applying a complicated formula involving a rational expression
13C	Analyzing the effect of changing values of one variable while other variables remain fixed in the compound interest formula	Simplifying fractions involving units (rather than numbers); Using the amortization formula	Analyzing the effect of changing values of one variable while other variables remain fixed in a formula
13D	Solving for principle in the compound interest formula; evaluating the order of operations with powers and radicals	Solving for the principle in the amortization formula	Analyzing the effect of changing values of one variable while other variables remain fixed in a formula
14A	Identifying equivalent equations; understanding the BMI formula	Identifying equivalent equations and solutions of equations	Evaluating and recording a sequence of steps when solving equations (multiplication and division only)
14B	Using equivalent equations to solve one-step equations; defining the Cartesian plane	Using order of operations; labeling points on the Cartesian plane	Reversing steps to find an input given an output of an equation
14C	Solving multi-step equations	Determining if a value is a solution to an equation	Evaluating an expression and reversing the sequence of steps to solve a corresponding equation (multiply/divide and add/subtract)
14D	Solving multi-step equations, plotting points on the Cartesian plane	Writing equivalent equations; plotting points on the Cartesian plane	Reversing steps to find an input given an output of an equation
15A	Identifying proportional and similar shapes; calculating measurement error	Identifying proportional and similar shapes; plotting points on the Cartesian plane	Determining whether proportions are equivalent
15B	Solving proportions	Writing and solving linear functions representing contextual problems	Solving proportions
15C	Solving equations using the distributive property and combining like terms	Simplifying using multi-step order of operations; solving multi-step equations	Practicing solving equations, solving formulas for a variable

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Lesson Number	Co-Requisite Worksheet Content	Preview Assignment Content	In-Class Activity Content
15D	Solving equations that have variables on both sides	Simplifying and solving algebraic equations; evaluating order of operations with signed values and exponents; understanding algebraic terminology	Solving equations (optional work chosen by instructor)
15E	Applications of proportions to similar triangles and scaling problems	Writing and solving linear functions representing contextual problems; solving proportions	Solving proportions and equations (optional work chosen by instructor)
16A	Writing unit rates, graphing, identifying the slope of a line	Creating multiple representations (going from algebraic to tabular to graphical)	Understanding slope as a unit rate in problems where the y-intercept is (0,0).
16B	Comparing slopes in problems with nonzero y-intercepts.	Creating multiple representations, comparing two linear graphs to determine when one deal becomes better than another deal	Comparing/contrasting rates as slopes in the context of gas mileage of three vehicles
16C	Calculating slope from any two points	Determining and interpreting slope from tabular data	Calculating slope from any two points when the y-intercept is nonzero
16D	Finding vertical and horizontal intercepts	Interpreting horizontal and vertical intercepts in context	Calculating the y-intercept by extrapolation from a table of values or a graph
16E	Using the slope-intercept form of a line to write the equation of a line	Reading and interpreting data in tabular form, making predictions using data	Calculating the y-intercept
17A	Creating multiple representations (going from graphical to verbal to tabular to algebraic)	Creating multiple representations (going from graphical to tabular to algebraic)	Using graphs, tables, algebraic, and verbal representations, interpreting the intersection of two lines in context
17B	Creating multiple representations	Creating multiple representations (going from verbal to tabular and/or graphical to algebraic)	Making decisions using multiple representations of data.
17C	Drawing trend lines	Understanding the Social Security system	Graphing scatterplots and drawing trend lines

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17D	Writing equations for different ranges of electricity usage	Calculating electricity utility bills	Interpolating and extrapolating using trend lines
18A	Writing algebraic expressions for percentage increase and decrease	Estimating percentages; combining like terms	Developing spreadsheet formulas for product markups and discounts
18B	Solving percent change equations	Developing spreadsheet formulas for percent increase	Determining the original value of a quantity prior to percent increase or decrease; optional mini-project available
18C	Developing an exponential model that gives prices under constant multi-year inflation	Calculating simple interest; understanding certificates of deposit	Developing an exponential formula for annually compounded interest
18D	Developing exponential formula for annually compounded interest	Calculating simple and annually compounded interest	Writing a formula for annual compound interest, comparing and contrasting linear and exponential models
19A	Calculating the period interest rate, comparing interest accrued under different compounding periods	Understanding population pyramids; evaluating exponential expressions on a calculator	Calculating monthly compounded interest, abstracting to a general equation for monthly compounded interest
19B	Calculating depreciation, graphing exponential curves	Comparing data presented in population pyramids; evaluating exponential expressions on a calculator	Calculating exponential decay, depreciation; optional project available
19C	Developing standard periodically compounded interest formula	Evaluating complicated exponential expressions on a calculator; understanding payday loans	Writing exponential models, calculating the effect of extremely high interest rate on total interest paid
19D	Comparing linear and exponential decay	Analyzing linear financial models such as simple interest	Comparing an exponential and linear model for calculating interest, and making a decision based on the comparison
19E	Evaluating a simple credit card payment schedule	Calculating the periodic interest rate, monthly interest	Comparing payment schedules, calculating the effect of making minimum credit card payments on time to pay-off and interest paid (optional)