Suggested Pacing Guide

Overview

The lessons in *TEKS Advanced Quantitative Reasoning* are designed to be covered over one, two, or three days, depending on the depth and complexity of the topic. The pacing guide that follows provides *suggested* pacing, but this should be viewed as a flexible guideline only. If students need an extra day to solidify understanding, a one-day lesson may be spread over two days, or a two-day lesson may be spread over three days. Conversely, if students grasp a concept more quickly than suggested by the pacing guide, it is fine to shorten the duration of the lesson and move on to the next topic.

Each lesson features several components. The estimated time for each component is given in parentheses. Components include: a Warm-Up, Instruction (including an Introduction, Key Concepts, Scaffolded Practice, and Guided Practice), a Problem-Based Task, and Practice (Sets A and B).

Guided Practice, Scaffolded Practice, and Practice

For each Guided Practice in the Teacher Resource (TRB), corresponding worksheets are provided in the Student Workbook (SWB). Scaffolded Practice worksheets are also included to reinforce the standard(s) at the DOK levels 1 and 2 for each lesson. Each lesson also includes two sets of Practice problems. Guided Practice, Scaffolded Practice, and Practice problems may be assigned from the SWB worksheets for in-class work or homework assignments.

Suggested Progression of One-, Two-, and Three-Day Lessons

One Day

- Warm-Up PowerPoint and Debrief (10 minutes)
- Introduction and Key Concepts (10 minutes)
- One or two Guided Practice Examples, including PowerPoint applet presentation for selected examples as appropriate (15 minutes)
- Problem-Based Task and discussion (30 minutes)
- Homework: Practice problems from the SWB

Two Days

Day 1

- Warm-Up PowerPoint and Debrief (10 minutes)
- Introduction and Key Concepts (15 minutes)
- Two or three Guided Practice Examples, including PowerPoint applet presentation for selected examples as appropriate (20 minutes)
- In-class practice: selected problems from the SWB Practice (20 minutes)
- Homework: selected Practice problems from the SWB

Day 2

- Review Practice problems (10 minutes)
- One or two remaining Guided Practice Examples, including PowerPoint applet presentation for selected examples as appropriate (15 minutes)
- Problem-Based Task and discussion (30 minutes)
- In-class practice: the remainder of the SWB Practice (15 minutes)
- Homework: the remainder of the Practice problems

Three Days

Day 1

- Warm-Up PowerPoint and Debrief (10 minutes)
- Introduction and Key Concepts (25 minutes)
- One or two Guided Practice Examples, including PowerPoint applet presentation for selected examples as appropriate (15 minutes)
- Homework: selected problems from the SWB Practice

Day 2

- Review Practice problems (15 minutes)
- Two or three remaining Guided Practice Examples, including PowerPoint applet presentation for selected examples as appropriate (15 minutes)
- Problem-Based Task and discussion (20 minutes)
- Homework: the remainder of the SWB Practice

Day 3

- Review Practice problems (15 minutes)
- In-class practice: selected problems from the SWB Practice (35 minutes)
- Homework: the remainder of the SWB Practice

Assessments, Conceptual Activities, and Performance Tasks

Each unit features a Pre-Assessment and Unit Assessment, and each topic concludes with a Progress Assessment. Most units also feature Performance Tasks, along with links to interactive web-based Conceptual Activities, to complement instruction.

Pre-Assessments are short, multiple-choice assessments with 10 problems, designed to evaluate prior knowledge of the upcoming topics in the unit. These are brief and should not factor into a student's grade.

Progress Assessments include 10 multiple-choice problems and one extended-response problem. Progress Assessments may not take an entire class period. The additional time may be used to review before the assessment, work through the Conceptual Activities, or to begin the next topic after the assessment.

Unit Assessments include 12 multiple-choice problems and three extended-response problems, and generally require a full class period.

Conceptual Activities are digital math resources that allow students to explore mathematical ideas with engaging, real-world problems and interactive games.

Performance Tasks are extension activities that focus on the TEKS Process Standards and are designed to provide students with opportunities to practice, reinforce, and apply mathematical skills and concepts to a real-world task. Performance Tasks generally require a full class period for collaborative groups that allow for mathematical discourse.

Unit 1: Descriptive Statistics (24 Days)

Unit Overview: Students begin by looking at ways to represent data of a single measurement variable. Then they examine the normal curve and how it can be used to estimate statistics. Next, students will work with two measurement variables by creating two-way frequency tables, fitting data to functions, and analyzing the fit of those functions using informal examinations of the graph and using residuals. Finally, students will interpret a statistical model by identifying key features of a function fitted to data. They will also determine how well the function fits the data by calculating and interpreting the correlation coefficient. Students will also begin to distinguish between correlation and causation in order to make decisions about whether a statistical inference is reasonable.

Topic A: Representing and Interpreting Data

Days	Area of study/content	Standard(s)
1 day	Unit Pre-Assessment Lesson 1.1: Representing Data Sets	TEKS.AQR.4P
2 days	Lesson 1.2: Comparing Data Sets	TEKS.AQR.4P
1 day	Lesson 1.3: Interpreting Data Sets	TEKS.AQR.4O TEKS.AQR.4P
1 day	Topic A Progress Assessment	

Topic B: Using the Normal Curve

Days	Area of study/content	Standard(s)
1 day	Lesson 1.4: Normal Distributions and the 68–95–99.7 Rule	TEKS.AQR.4P
1 day	Lesson 1.5: Standard Normal Calculations	TEKS.AQR.4P
1 day	Lesson 1.6: Assessing Normality	TEKS.AQR.4P
1 day	Topic B Progress Assessment	

Topic C: Summarizing, Representing, and Finding Patterns in Data

Days	Area of study/content	Standard(s)
1 day	Lesson 1.7: Summarizing Data Using Two-Way Frequency Tables	TEKS.AQR.3A
2 days	Lesson 1.8: Solving Problems Given Functions Fitted to Data	TEKS.AQR.3A
2 days	Lesson 1.9: Analyzing Residuals	TEKS.AQR.3A
1 day	Lesson 1.10: Fitting Linear Functions to Data	TEKS.AQR.3A
1 day	Topic C Progress Assessment	

Topic D: Interpreting Statistical Models

Days	Area of study/content	Standard(s)
2 days	Lesson 1.11: Interpreting Key Features	TEKS.AQR.3A
2 days	Lesson 1.12: Calculating and Interpreting the Correlation Coefficient	TEKS.AQR.3A
2 days	Lesson 1.13: Distinguishing Between Correlation and Causation	TEKS.AQR.3B
1 day	Topic D Progress Assessment	
1 day	**Unit Assessment**	

Unit 2: Probability (21 Days)

Unit Overview: Students begin by defining events, applying the Addition Rule, and learning about independence. Then, they progress toward conditional probabilities and the Multiplication Rule. This builds into using combinatorics to count and calculate probabilities. Next, students learn to make and analyze decisions based on probability. Finally, students will work with probability distributions such as expected value to evaluate probabilistic situations.

Topic A: Events

Days	Area of study/content	Standard(s)
1 day	Unit Pre-Assessment Lesson 2.1: Describing Events	TEKS.AQR.4B
1 day	Lesson 2.2: The Addition Rule	TEKS.AQR.4B
1 day	Lesson 2.3: Understanding Independent Events	TEKS.AQR.4C
1 day	Topic A Progress Assessment **Conceptual Activity/Flex Day** Desmos. "Chance Experiments."	

Topic B: Conditional Probability

Days	Area of study/content	Standard(s)
1 day	Lesson 2.4: Introducing Conditional Probability	TEKS.AQR.4C TEKS.AQR.4D
1 day	Lesson 2.5: Using Two-Way Frequency Tables	TEKS.AQR.4A
1 day	Lesson 2.6: The Multiplication Rule	TEKS.AQR.4C TEKS.AQR.4D
1 day	Topic B Progress Assessment **Conceptual Activity/Flex Day** Desmos. "Probability and 2-way Tables."	

Topic C: Combinatorics

Days	Area of study/content	Standard(s)
1 day	Lesson 2.7: Combinations and Permutations	TEKS.AQR.2E
1 day	Lesson 2.8: Probability with Combinatorics	TEKS.AQR.2E
1 day	Topic C Progress Assessment **Conceptual Activity/Flex Day** Illustrative Mathematics. "Alex, Mel, and Chelsea Play a Game."	

Topic D: Decision Making with Probability

Days	Area of study/content	Standard(s)
1 day	Lesson 2.9: Determining Fairness	TEKS.AQR.4E
2 days	Lesson 2.10: Making Decisions Using Probability	TEKS.AQR.4E
1 day	Topic D Progress Assessment	

Topic E: Probability Distributions

Days	Area of study/content	Standard(s)
1 day	Lesson 2.11: Creating Graphs of Probability Distributions	TEKS.AQR.4F
1 day	Lesson 2.12: Expected Value	TEKS.AQR.4F
1 day	Lesson 2.13: Developing Probability Distributions	TEKS.AQR.4F
1 day	Lesson 2.14: Using Probability Distributions to Evaluate Outcomes	TEKS.AQR.4F
1 day	Topic E Progress Assessment	
1 day	**Unit Assessment**	

Unit 3: Inferences and Conclusions from Data (24 Days)

Unit Overview: Students learn about populations versus random samples and random sampling. Then, they learn about strategies for collecting data, including surveys, experiments, and observational studies. Students estimate sample proportions and sample means and develop tools for comparing treatments and reading reports. Finally, they look at making and analyzing decisions with data.

Topic A: Populations Versus Random Samples and Random Sampling

Days	Area of study/content	Standard(s)
1 day	Unit Pre-Assessment Lesson 3.1: Differences Between Populations and Samples	TEKS.AQR.4M TEKS.AQR.4Q
1 day	Lesson 3.2: Simple Random Sampling	TEKS.AQR.4M TEKS.AQR.4Q
1 day	Lesson 3.3: Other Methods of Random Sampling	TEKS.AQR.4M TEKS.AQR.4O TEKS.AQR.4Q
1 day	Topic A Progress Assessment	

Topic B: Surveys, Experiments, and Observational Studies

Days	Area of study/content	Standard(s)
1 day	Lesson 3.4: Identifying Surveys, Experiments, and Observational Studies	TEKS.AQR.4L
1 day	Lesson 3.5: Designing Surveys, Experiments, and Observational Studies	TEKS.AQR.4L
1 day	Topic B Progress Assessment	

Topic C: Estimating Sample Proportions and Sample Means

Days	Area of study/content	Standard(s)
1 day	Lesson 3.6: Estimating Sample Proportions	TEKS.AQR.4I
2 days	Lesson 3.7: The Binomial Distribution	TEKS.AQR.4I
1 day	Lesson 3.8: Estimating Sample Means	TEKS.AQR.4I
1 day	Lesson 3.9: Estimating with Confidence	TEKS.AQR.4I TEKS.AQR.4Q
1 day	Topic C Progress Assessment **Conceptual Activity/Flex Day** Illustrative Mathematics. “Margin of Error for Estimating a Population.”	

Topic D: Comparing Treatments and Reading Reports

Days	Area of study/content	Standard(s)
1 day	Lesson 3.10: Evaluating Treatments	TEKS.AQR.4H TEKS.AQR.4J TEKS.AQR.4K
1 day	Lesson 3.11: Designing and Simulating Treatments	TEKS.AQR.4H TEKS.AQR.4J TEKS.AQR.4K
1 day	Lesson 3.12: Reading Reports	TEKS.AQR.2B TEKS.AQR.4H TEKS.AQR.4J TEKS.AQR.4K
1 day	Topic D Progress Assessment	

Topic E: Making and Analyzing Decisions

Days	Area of study/content	Standard(s)
2 days	Lesson 3.13: Making Decisions	TEKS.AQR.2G TEKS.AQR.4R TEKS.AQR.4S TEKS.AQR.4T
2 days	Lesson 3.14: Analyzing Decisions	TEKS.AQR.2G TEKS.AQR.4R TEKS.AQR.4S TEKS.AQR.4T
1 day	**Conceptual Activity/Flex Day** Mathematics Assessment Resource Service, University of Nottingham. "Representing Conditional Probabilities 1."	
1 day	Topic E Progress Assessment	
1 day	**Unit Assessment**	

Unit 4: Modeling with Functions (39 Days)

Unit Overview: Students begin by reviewing informal concepts of dimensional analysis and precision. Next, they will examine ways to create and rewrite exponential expressions and equations. Then they will work with logarithms as the inverse of exponentiation and discover properties of logarithms. Next, students will investigate trigonometric models, including graphing of sine and cosine. Then, students will create models to represent a context using previously studied function types, including piecewise models. Finally, students will analyze, create, and apply algorithms.

Topic A: Units of Measure

Days	Area of study/content	Standard(s)
1 day	Unit Pre-Assessment Lesson 4.1: Converting Units	TEKS.AQR.2A
1 day	Lesson 4.2: Modeling with Units and Precision in Modeling	TEKS.AQR.2A
1 day	Topic A Progress Assessment	

Topic B: Modeling Exponential Functions

Days	Area of study/content	Standard(s)
1 day	Lesson 4.3: Rewriting Exponential Expressions and Equations	TEKS.AQR.3C
2 days	Lesson 4.4: Building Functions Including Parameters	TEKS.AQR.3C
1 day	Topic B Progress Assessment **Conceptual Activity/Flex Day** Desmos. "Exponential Bundle."	

Topic C: Modeling Logarithmic Functions

Days	Area of study/content	Standard(s)
2 days	Lesson 4.5: Logarithmic Functions as Inverses	TEKS.AQR.3C
1 day	Lesson 4.6: Common Logarithms	TEKS.AQR.3C
2 days	Lesson 4.7: Natural Logarithms	TEKS.AQR.3C
1 day	Lesson 4.8: Graphing Logarithmic Functions	TEKS.AQR.3C
2 days	Lesson 4.9: Interpreting Logarithmic Models	TEKS.AQR.3C
1 day	Topic C Progress Assessment **Conceptual Activity/Flex Day** Desmos. "Polygraph: Exponential & Logarithmic Functions."	

Topic D: Graphs of Trigonometric Functions

Days	Area of study/content	Standard(s)
2 days	Lesson 4.10: Periodic Phenomena and Amplitude, Frequency, and Midline	TEKS.AQR.3D
3 days	Lesson 4.11: Using Trigonometric Functions to Model Periodic Phenomena	TEKS.AQR.3D
2 days	Topic D Progress Assessment **Conceptual Activity/Flex Day** Desmos: "Burning Daylight" or "Trigonometric Graphing: Introduction to Amplitude and Vertical Shift."	

Topic E: Modeling Trigonometric Functions

Days	Area of study/content	Standard(s)
2 days	Lesson 4.12: Graphing the Sine Function	TEKS.AQR.3D
2 days	Lesson 4.13: Graphing the Cosine Function	TEKS.AQR.3D
1 day	Topic E Progress Assessment	

Topic F: Choosing a Model

Days	Area of study/content	Standard(s)
2 days	Lesson 4.14: Linear, Exponential, and Quadratic Functions	TEKS.AQR.3C
2 days	Lesson 4.15: Piecewise, Step, and Absolute Value Functions	TEKS.AQR.3E
1 day	Topic F Progress Assessment	

Topic G: Algorithms

Days	Area of study/content	Standard(s)
2 days	Lesson 4.16: Introduction to Algorithms	TEKS.AQR.2H
2 days	Lesson 4.17: Creating and Applying Algorithms	TEKS.AQR.2H
1 day	Topic G Progress Assessment	
1 day	**Unit Assessment**	

Unit 5: Matrices (13 Days)

Unit Overview: Students learn to manipulate matrices using the operations of matrix addition, subtraction, scalar multiplication, and matrix multiplication. Next, students will work with vectors, including operations and applications of the determinant. Finally, students will work with matrices as a method for solving systems of equations.

Topic A: Manipulating Matrices

Days	Area of study/content	Standard(s)
1 day	Unit Pre-Assessment Lesson 5.1: Performing Operations on Matrices	TEKS.AQR.2F
1 day	Lesson 5.2: Using Operations on Matrices	TEKS.AQR.2F
1 day	Topic A Progress Assessment	

Topic B: Vectors

Days	Area of study/content	Standard(s)
1 day	Lesson 5.3: Representing and Modeling with Vector Quantities	TEKS.AQR.2F
1 day	Lesson 5.4: Performing Operations on Vectors	TEKS.AQR.2F
2 days	Lesson 5.5: Determinants and Vectors	TEKS.AQR.2F
1 day	Topic B Progress Assessment	

Topic C: Using Matrices to Solve Systems of Equations

Days	Area of study/content	Standard(s)
2 days	Lesson 5.6: Representing a System of Linear Equations as a Single Matrix	TEKS.AQR.2F
1 day	Lesson 5.7: Finding the Inverse of a Matrix and Using It to Solve a System of Equations	TEKS.AQR.2F
1 day	Topic C Progress Assessment	
1 day	**Unit Assessment**	

Unit 6: Finance (23 Days)

Unit Overview: Students begin by examining income considerations, including gross pay and net pay. Next, students will look at credit options, including interest considerations. Then, students will work with loans and financed purchases, including items purchased with amortized loans. Next, students will examine the banking sector, including reading statements and comparing account options. Finally, students will learn about investing vocabulary and parameters in order to understand how to read stock reports.

Topic A: Income

Days	Area of study/content	Standard(s)
1 day	Unit Pre-Assessment Lesson 6.1: Creating Equations and Inequalities—Gross Pay	TEKS.AQR.3F
1 day	Lesson 6.2: Creating Equations in Context—Net Pay	TEKS.AQR.3F
1 day	Lesson 6.3: Income and Constraints	TEKS.AQR.3F
1 day	Topic A Progress Assessment	

Topic B: Credit

Days	Area of study/content	Standard(s)
1 day	Lesson 6.4: Solving Linear Equations—Simple Interest	TEKS.AQR.3G
2 days	Lesson 6.5: Analyzing Credit Offers with Linear and Exponential Equations	TEKS.AQR.3G
1 day	Topic B Progress Assessment	

Topic C: Loans and Financed Purchases

Days	Area of study/content	Standard(s)
2 days	Lesson 6.6: Recursion and Sequences—Payment Plans	TEKS.AQR.3H
2 days	Lesson 6.7: Finite Geometric Series-—Amortized Loans	TEKS.AQR.3H
1 day	Topic C Progress Assessment **Conceptual Activity/Flex Day** Desmos. “Function Carnival, Part 2.”	

Topic D: Banking

Days	Area of study/content	Standard(s)
1 day	Lesson 6.8: Interpreting Complicated Expressions—Bank Statements and Savings Accounts	TEKS.AQR.3H
1 day	Lesson 6.9: Analyzing Savings Account Options Using Equations and Inequalities	TEKS.AQR.3H
1 day	Topic D Progress Assessment	

Topic E: Investing

Days	Area of study/content	Standard(s)
1 day	Lesson 6.10: Interpreting Expressions and Equations—Stocks and Shares	TEKS.AQR.3H
2 days	Lesson 6.11: Interpreting Stock Parameters	TEKS.AQR.3H
2 days	Lesson 6.12: Reading Stock Reports	TEKS.AQR.3H
1 day	Topic E Progress Assessment	
1 day	**Unit Assessment**	

Unit 7: Geometry (40 Days)

Unit Overview: Students begin by investigating properties of dilations. This builds to a formal definition of similarity and methods for proving similarity, such as AA, SAS, and SSS. Then, students will work with ratio statements, the Pythagorean Theorem, and similarity to solve problems using similarity and congruence. Students will then transition into the trigonometry of right triangles, including calculating trigonometric ratios and understanding their properties. Next, students will learn about the trigonometry of general angles using the laws of sines and cosines. Finally, students will investigate formal truth tables and their applications in formal logic.

Topic A: Investigating Properties of Dilations

Days	Area of study/content	Standard(s)
2 days	Unit Pre-Assessment Lesson 7.1: Investigating Properties of Parallelism and the Center	TEKS.AQR.2C
1 day	Lesson 7.2: Investigating Scale Factors	TEKS.AQR.2C
1 day	Topic A Progress Assessment **Conceptual Activity/Flex Day** Desmos. "Working with Dilations."	

Topic B: Defining and Applying Similarity

Days	Area of study/content	Standard(s)
1 day	Lesson 7.3: Defining Similarity	TEKS.AQR.2D
1 day	Lesson 7.4: Applying Similarity Using the Angle-Angle (AA) Criterion	TEKS.AQR.2D
1 day	Topic B Progress Assessment	

Topic C: Proving Similarity

Days	Area of study/content	Standard(s)
2 days	Lesson 7.5: Proving Triangle Similarity Using Side-Angle-Side (SAS) and Side-Side-Side (SSS) Similarity	TEKS.AQR.2D
1 day	Lesson 7.6: Working with Ratio Segments	TEKS.AQR.2D
1 day	Lesson 7.7: Proving the Pythagorean Theorem Using Similarity	TEKS.AQR.2D

Days	Area of study/content	Standard(s)
1 day	Lesson 7.8: Solving Problems Using Similarity and Congruence	TEKS.AQR.2D
2 days	Lesson 7.9: Special Right Triangles	TEKS.AQR.2D
1 day	Topic C Progress Assessment **Conceptual Activity/Flex Day** Desmos. "Special Right Triangles."	

Topic D: Exploring Trigonometric Ratios

Days	Area of study/content	Standard(s)
2 days	Lesson 7.10: Defining Trigonometric Ratios	TEKS.AQR.2D
2 days	Lesson 7.11: Exploring Sine and Cosine As Complements	TEKS.AQR.2D
2 days	Topic D Progress Assessment **Conceptual Activity/Flex Day** Illuminations. "Trigonometry Square."	

Topic E: Applying Trigonometric Ratios

Days	Area of study/content	Standard(s)
2 days	Lesson 7.12: Calculating Sine, Cosine, and Tangent	TEKS.AQR.2D
3 days	Lesson 7.13: Problem Solving with the Pythagorean Theorem and Trigonometry	TEKS.AQR.2D
1 day	Topic E Progress Assessment **Conceptual Activity/Flex Day** Illustrative Mathematics. "Mt. Whitney to Death Valley."	

Topic F: Trigonometry of General Angles

Days	Area of study/content	Standard(s)
2 days	Lesson 7.14: Proving the Law of Sines	TEKS.AQR.2D
2 days	Lesson 7.15: Proving the Law of Cosines	TEKS.AQR.2D
2 days	Lesson 7.16: Applying the Laws of Sines and Cosines	TEKS.AQR.2D
1 day	Topic F Progress Assessment	

Topic G: Using Truth Tables

Days	Area of study/content	Standard(s)
2 days	Lesson 7.17: Using Truth Tables	TEKS.AQR.4G
1 day	Topic G Progress Assessment	
1 day	**Unit Assessment**	

2 days	**End-of-Course Assessment**