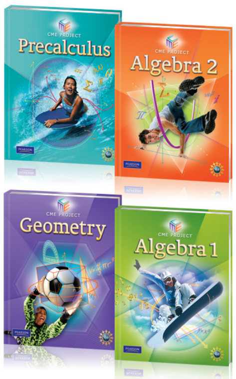
Correlation of Common Core State Standards



The following is an alignment of the Common Core State Standards for Mathematics (June 2, 2010 release) to Pearson's *CME Project Algebra 1, Geometry, Algebra 2,* and *Precalculus*. In this document, you will find some Standards Activities that can give you ideas for adapting or augmenting lessons in the program as you prepare your students for learning in the Common Core classroom. For selected standards, we offer you additional activities with detailed teacher notes that often highlight the Mathematical Practices that are a key component of these Standards. The additional activities are available from your Pearson Account Representative.

Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Standards for Mathematical Practices	
1. Make sense of problems and persevere in solving them.	The "experience before formality" principle in *CME Project* has sense making as one of its main goals. We see to it that definitions and theorems are capstones, not foundations, and that students spend plenty of time playing with ideas in simple and transparent cases before the ideas are formalized and made precise. The student dialogues play a role here, too, giving examples of how students gradually refine insights through perseverance and through attempts to communicate with others. Algebraic expressions are purposefully transformed so that students can see where an expression is zero or where it is optimized. Stamina is developed in several ways—recurring themes throughout the program and open-ended, long-term projects at the end of every chapter. **Algebra 1:** For examples, see 1.1, 1.11, 2.6, Ch. 2 Project, 5.1, 5.7, 5.10, 6.1, 7.5, 7.11, Ch. 7 Project, 8.5, 8.10 **Geometry:** For examples, see 1.0, 1.6 (Ex. 15), 1.11, 2.4, 2.9, 2.14, 5.4, 8.2, 8.5, 8.6 **Algebra 2:** For examples, see 1.1, 1.3, 1.5, 1.6, 1.8, 1.9, 1.12, 2.2, 2.4, 2.6, 2.7, 2.10, 2.13, 2.14, 3.3, 3.11, 4.2, 4.6, 5.3, 6.3, 6.7, 6.9, 7.2, 7.3, 8.11, 8.13 **Precalculus:** For examples, see 1.5, Ch. 1 Project, 2.5, 4.1, 4.5, 4.8, Ch. 4 Project, 5.11, Ch. 5 Project, 6.13, 7.4, 8.2, 8.4

Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
2. Reason abstractly and quantitatively.	The whole "contextualize-decontextualize" dialectic is another major theme of *CME Project*. In Algebra 1, variables start out as placeholders for numbers, and problems always refer back to the quantities that are represented. As the course (and the program) progresses, the symbols become contexts in their own right, so that, for example, the system of polynomials is eventually studied as a structure with its own internal logic. This approach is echoed in the recently released NCTM Reasoning and Sense Making in High School Mathematics report: *Although a long-term goal of algebraic learning is a fluid, nearly automatic facility with manipulating algebraic expressions that might seem to resemble what is often called "mindless manipulation," this ease can be best achieved by first learning to pay close attention to interpreting expressions, both at a formal level and as statements about real-world situations.* **Algebra 1:** For examples, see 1.2, 2.4, 3.3, 3.6, 4.7, 4.11, 4.14, 6.3, 6.10, 6.15, 7.1, 7.4, 7.8, 8.8, 8.12 **Geometry:** For examples, see 1.0, 1.11, 2.6, 3.8, 3.11, 5.3, 6.7, 8.2, 8.3 **Algebra 2:** 2.5, 2.6, 2.7, 3.5, 3.8, 4.8, 7.4 **Precalculus:** For examples, see 1.1, 1.4, 1.10, 2.4, 3.2, 3.6, 3.14, 4.10, 5.1, 5.3, 5.7, 5.13, 6.4, 6.5, 6.6, 6.12, 7.1, 7.8

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3. Construct viable arguments and critique the reasoning of others.	The roles of proof and justification—as means for establishing results, communicating ideas, and discovering new conjectures—is emphasized in all four courses. Students not only learn to read and understand logical arguments, they learn to construct such arguments for themselves. They learn to develop proofs in algebra by looking at the structure of numerical calculations, and they study explicit and general-purpose methods for constructing geometric proofs, combinatorial proofs, and proofs by mathematical induction. A recurring type of problem across the program ("What's Wrong Here") asks students to critique and repair errors in reasoning. **Algebra 1:** For examples, see 2.11, 2.12, 2.16, 3.4, 4.10, 5.11, 6.4, 6.7, 6.10, 7.2, 7.10, 8.3 **Geometry:** For examples, see 1.0, 2.6, 2.11–2.14, 3.3, 3.4, 3.8, 4.11, 4.15, 6.6, 6.9 **Algebra 2:** 1.3, 2.2, 3.3, 3.4, 3.12, 4.9, 5.7–5.9, 5.12, 5.13, 5.15, 6.3, 6.9, 6.10, 8.0, 8.2, 8.3, 8.4, 8.7, 8.9, 8.12 **Precalculus:** For examples, see 1.12, 2.6, 3.7, 4.2, 4.3, 4.8, 6.3, Ch. 7 Project, 8.3, 8.9
4. Model with mathematics.	Students in *CME Project* build mathematical models using functions, equations, graphs, tables, and technology. They learn how to abstract from data to build equations that model a host of phenomena. They build geometric diagrams to represent probability calculations. They use functions and spreadsheets to calculate payments on a loan. They also model mathematical phenomena, building computational models of mathematical functions (including recursively defined functions), and then applying their models to contexts ranging from monthly payments to Pythagorean triples. They also use mathematics to build approximate models for data: one of the distinguishing features of *CME Project* is that students learn how to calculate a line of best fit using quadratic functions. **Algebra 1:** For examples, see 2.2, 2.14–2.17, 3.5–3.9, 3.15, 4.3, 4.10, Ch. 4 Project, 5.10–5.12, Ch. 5 Project, 6.13, 6.14, 8.6 **Geometry:** For examples, see 1.0, 5.13, 6.1, 6.7, 8.5, 8.6, 8.7 **Algebra 2:** For examples, see 1.2, 1.6, 1.11, 1.12, 2.4, 2.9, 4.3–4.5, 4.7, 4.10, 4.12, 4.13, 5.10, 5.15, 7.1, 7.11 **Precalculus:** For examples, see 1.13, 3.3, 3.10, 3.11, 4.1, 4.3, 4.7, 5.3, 5.10, 5.14, 6.6, 6.7, 7.3, 7.5, 7.6, 7.8, 7.11, 7.12

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5. Use appropriate tools strategically.	Students in *CME Project* use an array of tools ranging from physical devices to experiment with geometric optimization problems to technological tools. Technology is integrated throughout the program, with an appendix at the end of each book keyed to the TI-Nspire handhelds. Specifically, students in the program use a function modeling language and a spreadsheet to build computational models of functions, a dynamic geometry environment to develop reasoning by continuity, and a computer algebra system to support algebraic habits of mind. The technology is used in three ways: • to provide students a platform for experimenting with mathematical objects, • to make tractable and to enhance many classical topics, historically considered too technical for high school students, by reducing computational overhead, and • to allow students to build computational models of mathematical objects that have no faithful physical counterparts, highlighting similarities in structure. **Algebra 1:** For examples, see 2.10, 3.9, Ch. 3 Project, 4.14, 4.15, 5.6, 5.9, 5.12, 6.7, Ch. 6 Project, 8.6, 8.10, 8.11, Ch. 8 Project **Geometry:** For examples, see 1.0, 1.6, 1.11, 2.7, 2.8, 2.14, 2.19, 4.8, 5.11, 6.2, 7.7, 7.8 **Algebra 2:** For examples, see 1.2, 1.7, 1.11, 1.12, 2.2, 2.3, 2.6, 2.7, 2.9, 2.12, 3.6, 3.9–3.11, 4.3, 4.7, 4.8, 5.9, 5.11–5.14, 6.1, 8.7 **Precalculus:** For examples, see 1.5, 2.2, 3.7, 3.10, 3.13, 5.1, 5.11–5.14, 6.1, 6.3, 6.9, 7.3, 7.12, 8.7, 8.9

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6. Attend to precision.	Students not only learn to use precise definitions, they learn to formulate them as a means to communicate with others. One device for helping them do this is the recurring "Minds in Action" dialogues that feature students wrestling with how to say what they know in precise mathematical language. Another design feature is that the curriculum introduces vocabulary only when students need it. For example, students work with polynomials informally early in Algebra 1, but terminology such as monomial, degree, and coefficient are not introduced until they start studying these things formally. In addition, they learn to distinguish convention in this language (the coefficients of $ax + b$ are usually taken to be a and b) from well-defined notions like the meaning of "degree." They learn to critique a proposed definition by seeking counterexamples and by trying cases to see if the definition captures what they want it to capture. **Algebra 1:** For examples, see Lessons 1.8, 1.12, 1.13, 1.14, 3.4, 3.7, 3.12, 4.2, 4.8, 5.2, 6.5, 7.10, 8.4, 8.11 **Geometry:** For examples, see 1.0, 1.5, 2.4, 5.2, 2.18, 3.2, 3.3, 3.11, 3.13, 4.15, 5.2, 6.11 **Algebra 2:** For examples, see Lessons 1.8, 2.2, 2.9, 3.4, 4.7, 5.3, 5.7, 5.8, 5.10, 5.12, 5.14, 6.2, 7.10, 7.12, 8.2, 8.3 **Precalculus:** For examples, see 1.2, 2.3, 2.7, 2.11, 3.12, 4.6, 5.12, 6.2, 6.7, 7.7, 7.10, 8.6

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7. Look for and make use of structure.	Students look for regularity and structure in almost every lesson of *CME Project*. From the first lesson of Algebra 1, they start looking for hidden structure in arithmetic tables. Our whole approach to completing the square, "lumping" to remove terms in the factoring lessons, and transforming area formulas is devoted to seeing and making use of structure in algebraic expressions. Students also build mathematical structures in the more traditional sense: in Algebra 2, they study the algebra of functions, and they are introduced to complex numbers as polynomials with an extra simplification rule. In Precalculus, they create algebraic groups (without calling them that) of roots of unity via "remainder arithmetic" with polynomials. **Algebra 1:** For examples, see 1.3, 1.4, 1.9, 3.14, 3.17, 5.8, 6.4, 7.3, 7.8, 7.12, 8.4, 8.7 **Geometry:** For examples, see 1.0, 2.10, 3.4, 3.15, 4.11, 4.12, 4.16, 5.10, 5.11, 6.2, 6.6, 6.7, 7.6 **Algebra 2:** For examples, see Lessons 1.4, 1.5, 2.8, 2.12–2.14, 3.2, 3.12, 3.13, 5.5, 5.11, 6.4, 6.6, 7.3, 7.6, 8.5 **Precalculus:** For examples, see 1.6, 1.9, 2.10, 3.4, 3.9, Ch. 3 Project, 4.7, 4.11, 5.8, 7.2, 8.5

Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
8. Look for and express regularity in repeated reasoning.	This is an explicit habit of mind that is given serious attention in *CME Project,* especially in the algebra courses. Our approach to finding equations and functions that model situations, to finding equations of lines, to fitting functions to data, and to finding and establishing algebraic identities all revolve around this practice. Often, students look at a problem and have no idea how to start: a common mantra in *CME Project* is "try it with numbers." Mathematics is open to experiment, and general results, or at least conjectures, often spring from trying examples, looking for regularity, and seeking what seem to be general trends. For example, we ask Algebra 1 students to think about which positive integers can be represented as a difference of two perfect squares. This can lead to a lovely result, but there's another reason to include it in an algebra course: it helps students develop the habit of generalizing from examples. This practice is a cornerstone of our program, a general-purpose habit that will serve students well in all their technical endeavors. **Algebra 1:** For examples, see 2.1, 2.2, 2.14–2.16, 3.10, 3.11, 4.4, 4.6, 5.9–5.11, 6.13, 7.9, 8.2, 8.5 **Geometry:** For examples, see 1.0, 1.11, 2.6, 5.2–5.4, 6.7, 7.6, 7.7 **Algebra 2:** For examples, see 2.3, 2.4, 2.10, 3.9, 4.2, 4.11, 5.2, 55.4, 5.5, 6.2, 7.15, 8.14 **Precalculus:** For examples, see 1.11, 3.5, 3.12, 4.3, 4.6, 4.9, 5.1, 5.2, 5.5, 5.9, 6.2, 7.9, 7.10, 8.8
Number and Quantity	
The Real Number System	
Extend the properties of exponents to rational exponents	
N-RN.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define* $5^{1/3}$ *to be the cube root of 5 because we want* $(5^{1/3})^3 = 5^{(1/3)3}$ *to hold, so* $(5^{1/3})^3$ *must equal 5.*	**Algebra 2 Lesson coverage** 5.3–5.5
N-RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.	**Algebra 1 Lesson coverage** 6.11 **Algebra 2 Lesson coverage** 5.4, 5.5 **Precalculus Lesson coverage** 3.13 Ex. 1

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Use properties of rational and irrational numbers.	
N-RN.3 Explain why sums and products of rational numbers are rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	**Algebra 1 Lesson coverage** 1.13, 1.15, 6.10 **Algebra 1 Standards Activity** In Lesson 6.10, have students answer the following questions. 1. Show that the sum of two rational numbers is rational. [If $\frac{a}{b}$ and $\frac{c}{d}$ are rational, so that *a, b, c,* and *d* are integers and *b* and *d* are not zero, then by the basic rules, $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$. Both the numerator and denominator are integers, and $bd \neq 0$ since neither $b \neq 0$ nor $d \neq 0$. Therefore $\frac{ad + bc}{bd}$ is rational.] 2. Show that the product of two rational numbers is rational. [If $\frac{a}{b}$ and $\frac{c}{d}$ are rational, so that *a, b, c,* and *d* are integers and *b* and *d* are not zero, then by the basic rules, $\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$. The numerator and denominator are integers, and $bd \neq 0$ since neither $b \neq 0$ nor $d \neq 0$. Therefore $\frac{ac}{bd}$ is rational.] 3. Show that $\frac{1}{2} + \sqrt{5}$ is irrational. [If $\frac{1}{2} + \sqrt{5}$ were a rational number, say $\frac{p}{q}$ then $\sqrt{5} = \frac{p}{q} - \frac{1}{2}$ by the basic rules. But the right-hand side is rational by Exercise 1, and the left-hand side is irrational. Since this cannot be true, $\frac{1}{2} + \sqrt{5}$ is irrational.] 4. Show that $\frac{1}{2} \cdot \sqrt{5}$ is irrational. [If $\frac{1}{2} \cdot \sqrt{5}$ were a rational number, say $\frac{p}{q}$ then $\sqrt{5} = \frac{p}{q} \cdot 2$, which is the same as $\sqrt{5} = \frac{2p}{q}$, by the basic rules. But the right-hand side is rational by Exercise 2 and the left-hand side is irrational. Since this cannot be true, $\frac{1}{2} \cdot \sqrt{5}$ is irrational.] 3. Discuss the For You to Do #6 on page 549.
Quantities	
Reason quantitatively and use units to solve problems	
N-Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	**Algebra 1 Lesson coverage** 1.13, 2.17, 3.4, 3.7, 3.9, 3.15, 4.3, 4.8, Ch. 4 Project, 8.7 Ex. 4–7, 8.11 **Geometry Lesson coverage** 3.13–3.15, 4.1, 4.2 **Algebra 2 Lesson coverage** 1.6–1.9, 1.11, Chapter Project 1, 2.2, 5.8, 5.10, 5.13, 5.14, 5.15, 7.1, 7.4, 8.7, 8.8, 8.11 **Precalculus Lesson coverage** 7.7, 7.11–7.13
N-Q.2 Define appropriate quantities for the purpose of descriptive modeling.	**Algebra 1 Lesson coverage** 4.3 **Algebra 2 Lesson coverage** 1.7, 1.11 **Precalculus Lesson coverage** 6.9

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N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	**Algebra 1 Lesson coverage** 3.7, 4.15 **Algebra 2 Lesson coverage** 1.7, 1.11 **Precalculus Lesson coverage** 7.10
The Complex Number System	
Perform arithmetic operations with complex numbers	
N-CN.1 Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	**Algebra 2 Lesson coverage** 3.2–3.4 **Precalculus Lesson coverage** 2.1, 2.2, 2.12
N-CN.2 Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	**Algebra 2 Lesson coverage** 3.4–3.6 **Precalculus Lesson coverage** 2.1, 2.2, 2.12
N-CN.3 (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	**Algebra 2 Lesson coverage** 3.4, 3.5, 3.9 **Precalculus Lesson coverage** 2.1, 2.2 NOTE: The term modulus is synonymous with absolute value of a complex number.
Represent complex numbers and their operations on the complex plane	
N-CN.4 (+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	**Algebra 2 Lesson coverage** 3.6–3.7, 3.9, 3.10 **Precalculus Lesson coverage** 2.2, 2.3, 2.8–2.11
N-CN.5 (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. *For example,* $(1 - \sqrt{3}i)^3 = 8$ *because* $(1 - \sqrt{3}i)$ *has modulus 2 and argument 120°.*	**Algebra 2 Lesson coverage** 3.8, 3.11, 3.12 **Precalculus Lesson coverage** 2.3, 2.4, 2.6, 2.9, 2.11
N-CN.6 (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	**Algebra 2 Standards Activity** After Algebra 2 Lesson 3.9, have students graph the complex numbers in Exercise 9 on the complex plane. Ask students to find the distances between selected pairs complex numbers in the graph using the distance formula. Then ask students to find the modulus of the difference of those same pairs of complex numbers. Ask, "What relationship do you see?" [The distance between two complex numbers is the same as the modulus of their difference.] Have students find the midpoints of the segments connecting selected pairs of complex numbers in the graph. Interpret this midpoint as a complex number. Then have them find the averages of those same pairs of complex numbers. Ask, "What relationship do you see?" [The midpoint of each segment is the average of its endpoints.]

(+) indicates additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics.

Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Use complex numbers in polynomial identities and equations	
N-CN.7 Solve quadratic equations with real coefficients that have complex solutions.	**Algebra 2 Lesson coverage** 3.3–3.4, 3.12 **Precalculus Lesson coverage** 2.8, 2.9
N-CN.8 (+) Extend polynomial identities to the complex numbers. *For example, rewrite* $x^2 + 4$ *as* $(x + 2i)(x - 2i)$.	**Algebra 2 Lesson coverage** 3.4, Ex. 14 **Precalculus Lesson coverage** 2.8–2.10
N-CN.9 (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	**Algebra 2 Lesson coverage** 3.4, 3.12 **Precalculus Lesson coverage** 2.10–2.11
Vector and Matrix Quantities	
Represent and model with vector quantities.	
N-VM.1 (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., $\mathbf{v}$, $\lvert\mathbf{v}\rvert$, $\lVert\mathbf{v}\rVert$, v).	**Geometry Lesson coverage** 7.11–7.12 **Algebra 2 Lesson coverage** 3.7–3.11 **Precalculus Lesson coverage** 6.10, 6.11, 6.13
N-VM.2 (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.	**Geometry Lesson coverage** 7.11 **Precalculus Lesson coverage** 6.11
N-VM.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors.*	**Precalculus Lesson coverage** 6.12, 6.13
Perform operations on vectors.	
N-VM.4 (+) Add and subtract vectors.	
N-VM.4.a Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.	**Geometry Lesson coverage** 7.11–7.12 **Algebra 2 Lesson coverage** 3.8 **Precalculus Lesson coverage** 6.11–6.13
N-VM.4.b Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.	**Geometry Lesson coverage** 7.11–7.12
N-VM.4.c Understand vector subtraction $\boldsymbol{v} - \boldsymbol{w}$ as $\boldsymbol{v} + (-\boldsymbol{w})$, where $-\boldsymbol{w}$ is the additive inverse of $\boldsymbol{w}$, with the same magnitude as $\boldsymbol{w}$ and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	**Geometry Lesson coverage** 7.11–7.12 **Algebra 2 Lesson coverage** 3.8 **Precalculus Lesson coverage** 6.10 Ex. 2, 6.11
N-VM.5 (+) Multiply a vector by a scalar.	

* indicates modeling standards.

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N-VM.5.a Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$.	**Geometry Lesson coverage** 7.11–7.12 **Algebra 2 Lesson coverage** 3.8 **Precalculus Lesson coverage** 6.12
N-VM.5.b Compute the magnitude of a scalar multiple $c\mathbf{v}$ using $\|\|c\mathbf{v}\|\| = \|c\|\mathbf{v}$. Compute the direction of $c\mathbf{v}$ knowing that when $\|c\| \neq 0$, the direction of $c\mathbf{v}$ is either along $\mathbf{v}$ (for $c > 0$) or against $\mathbf{v}$ (for $c < 0$).	**Algebra 2 Lesson coverage** 3.11 **Precalculus Lesson coverage** 6.11, 6.12
N-VM.5.c Understand that when $\|c\|\boldsymbol{v} \neq 0$, the direction of $c\boldsymbol{v}$ is either along $\boldsymbol{v}$ (for $c > 0$) or against $\boldsymbol{v}$ (for $c < 0$).	**Algebra 2 Lesson coverage** 3.11 **Precalculus Lesson coverage** 6.11, 6.12
Perform operations on matrices and use matrices in applications.*	
N-VM.6 (+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.	**Algebra 2 Lesson coverage** 4.4–4.5, 4.7, 4.10 **Precalculus Lesson coverage** 3.9
N-VM.7 (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.	**Algebra 2 Lesson coverage** 4.5 **Precalculus Lesson coverage** 6.10 Ex. 9
N-VM.8 (+) Add, subtract, and multiply matrices of appropriate dimensions.	**Algebra 2 Lesson coverage** 4.5–4.7
N-VM.9 (+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.	**Algebra 2 Lesson coverage** 4.7–4.9
N-VM.10 (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	**Algebra 2 Lesson coverage** 4.8–4.9
N-VM.11 (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.	**Algebra 2 Lesson coverage** 4.10–4.11
N-VM.12 (+) Work with 2 × 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.	**Algebra 2 Lesson coverage** 4.11

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Algebra	
Seeing Structure in Expressions	
Interpret the structure of expressions.	
A-SSE.1 Interpret expressions that represent a quantity in terms of its context.*	**Algebra 1 Lesson coverage** 2.2–2.3, 2.5, 2.17, 3.3, 4.6, 7.1, 7.2, 7.5, 7.7, 7.8, 7.10, 8.4 **Algebra 2 Lesson coverage** 1.11, 1.12, 2.0, 2.6, 2.8, 2.9–2.14, 5.8, 7.1, 7.3, 7.6, 7.11 **Precalculus Lesson coverage** 1.4, 1.12, 1.13, 2.3, 2.6, 2.7
A-SSE.1.a Interpret parts of an expression, such as terms, factors, and coefficients.	**Algebra 1 Lesson coverage** 7.1, 7.2, 7.5, 7.7, 7.8, 7.10 **Algebra 2 Lesson coverage** 2.0, 2.8 **Precalculus Lesson coverage** 1.12, 2.3
A-SSE.1.b Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret* $P(1 + r)^n$ *as the product of P and a factor not depending on P.*	**Algebra 1 Lesson coverage** 2.5 Ex. 5, 3.3, 4.6, 7.10, 8.4 **Algebra 2 Lesson coverage** 2.6, 2.10–2.14, 7.6 **Precalculus Lesson coverage** 1.4, 2.7
A-SSE.2 Use the structure of an expression to identify ways to rewrite it. *For example, see* $x^4 - y^4$ *as* $(x^2)^2 - (y^2)^2$*, thus recognizing it as a difference of squares that can be factored as* $(x^2 - y^2)(x^2 + y^2)$.	**Algebra 1 Lesson coverage** 2.9, 4.6, 7.2, 7.3, 7.9, 7.10, 7.11 **Algebra 2 Lesson coverage** 2.12–2.14, 3.3–3.5, 5.1–5.3, 5.5 **Precalculus Lesson coverage** 2.7, 2.10
Write expressions in equivalent forms to solve problems	
A-SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	**Algebra 1 Lesson coverage** 6.13, 7.2, 7.3, 7.4, 7.10–7.12, 8.6, 8.7 **Algebra 2 Lesson coverage** 2.0, 2.9, 2.10, 2.12–2.14, 3.3–3.5, 3.13, 5.1–5.3, 5.5, 5.12–5.14, 6.7, 7.6 **Precalculus Lesson coverage** 1.4, 3.1, 3.2, 3.3, 3.4, 5.13, 6.2, 6.4, 6.8
A-SSE.3.a Factor a quadratic expression to reveal the zeros of the function it defines.	**Algebra 1 Lesson coverage** 7.2, 7.3, 7.4, 7.10, 7.11, 8.6 **Algebra 2 Lesson coverage** 2.0, 2.10, 2.12 **Precalculus Lesson coverage** 1.4, 5.13, 6.2
A-SSE.3.b Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	**Algebra 1 Lesson coverage** 7.12, 8.6, 8.7 **Algebra 2 Lesson coverage** 6.7 **Precalculus Lesson coverage** 6.4, 6.8
A-SSE.3.c Use the properties of exponents to transform expressions for exponential functions. *For example the expression* 1.15^t *can be rewritten as* $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ *to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	**Algebra 1 Lesson coverage** 6.13 Ex.11 **Algebra 2 Lesson coverage** 5.1–5.3, 5.5

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
A-SSE.4 Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.**	**Algebra 1 Lesson coverage** 7.1 Ex. 14, 7.4 Ex. 10, 7.18 Ex. 18 **Algebra 2 Lesson coverage** 1.11, 7.11–7.13 **Precalculus Lesson coverage** 3.9 Ex. 17, 5.12, 5.14
Arithmetic with Polynomials and Rational Expressions	
Perform arithmetic operations on polynomials	
A-APR.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	**Algebra 1 Lesson coverage** 7.6
Understand the relationship between zeros and factors of polynomial	
A-APR.2 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	**Algebra 2 Lesson coverage** 2.9–2.10 **Precalculus Lesson coverage** 3.3–3.5
A-APR.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	**Algebra 1 Lesson coverage** 7.3, 7.10–7.12, 8.2, 8.4, 8.6–8.8 **Algebra 2 Lesson coverage** 2.10, 2.12, 2.13 **Precalculus Lesson coverage** 3.1, 3.2
Use polynomial identities to solve problems	
A-APR.4 Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity* $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ *can be used to generate Pythagorean triples.*	**Algebra 1 Lesson coverage** 7.1 Ex. 13, 15 **Algebra 2 Lesson coverage** 2.10, 3.1 **Precalculus Lesson coverage** 2.1 Ex. 7, 2.2 Ex. 15
A-APR.5 (+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle. NOTE: The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.	**Algebra 1 Lesson coverage** 7.1, 7.2, 7.5, 7.7, 7.9 Ex. 14–15 **Algebra 2 Lesson coverage** 7.15–7.16 **Precalculus Lesson coverage** 4.9, 4.10, 7.1, 7.4, 7.10, 7.12
Rewrite rational expressions	
A-APR.6 Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	**Algebra 2 Lesson coverage** 2.9 **Precalculus Lesson coverage** 3.3, 3.7, 3.8

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
A-APR.7 (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	**Algebra 2 Lesson coverage** 2.15 **Precalculus Lesson coverage** 3.7, 3.9
Creating Equations*	
Create equations that describe numbers or relationships	
A-CED.1 Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*	**Algebra 1 Lesson coverage** 2.8, 2.10–2.11, 2.14–2.16, 3.5, 4.13–4.14, 5.2, 5.7, 5.10–5.11 **Algebra 2 Lesson coverage** 1.6–1.9, 5.7–5.9
A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	**Algebra 1 Lesson coverage** 2.17, 4.4, 6.12–6.15, 8.5–8.6, 8.7 Ex. 4–7, 8.11 **Algebra 2 Lesson coverage** 4.4–4.5, 4.7 **Precalculus Lesson coverage** 3.3, 3.5, 3.12, 6.1
A-CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	**Algebra 1 Lesson coverage** 3.12, 4.8, 4.8, 4.10, 4.12–4.14, 8.5–8.6, 8.10–8.11
A-CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law $V = IR$ to highlight resistance R.*	**Algebra 1 Lesson coverage** 2.17, 4.6–4.7, 7.1–7.3, 7.4 Ex. 7–8 **Precalculus Lesson coverage** 2.6, 2.7
Reasoning with Equations and Inequalities	
Understand solving equations as a process of reasoning and explain the reasoning	
A-REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	**Algebra 1 Lesson coverage** 2.10–2.13 **Geometry Lesson coverage** 3.8 **Precalculus Lesson coverage** 1.4
A-REI.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	**Algebra 1 Lesson coverage** 3.15, 5.11, 6.11 **Algebra 2 Lesson coverage** 2.12 Ex. 4, 2.14 Ex. 6 **Precalculus Lesson coverage** 3.6, 3.7, 6.5, 6.6

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Solve equations and inequalities in one variable	
A-REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**Algebra 1 Lesson coverage** 2.11–2.13, 2.17, 4.11 **Algebra 1 Standards Activity** After Lesson 4.14, have students solve the following inequalities for x. 1. $-2x \geq a$ [$x \leq \frac{a}{-2}$] 2. $2x < x + c$ [$x < c$] 3. $c - 3x \geq d - 5x$ [$x \geq \frac{d-c}{2}$]
A-REI.4 Solve quadratic equations in one variable.	**Algebra 1 Lesson coverage** 7.3, 7.10–7.12, 8.1–8.4 **Algebra 2 Lesson coverage** 2.0, 2.1, 2.12, 3.1–3.4 **Precalculus Lesson coverage** 1.4, 2.1 5.13, 6.2, 6.4, 6.8
A-REI.4.a Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	**Algebra 1 Lesson coverage** 7.12, 8.1, 8.2 **Algebra 2 Lesson coverage** 2.12 Ex. 5 **Precalculus Lesson coverage** 2.1 Ex. 8
A-REI.4.b Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	**Algebra 1 Lesson coverage** 7.3, 7.10, 7.11, 7.12, 8.2, 8.3, 8.4 **Algebra 2 Lesson coverage** 3.2–3.4 **Precalculus Lesson coverage** 2.1 Ex. 8, 5.13
Solve systems of equations	
A-REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	**Algebra 1 Lesson coverage** 4.12
A-REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	**Algebra 1 Lesson coverage** 4.10–4.12 **Algebra 2 Lesson coverage** 4.1–4.3 **Precalculus Lesson coverage** 5.13
A-REI.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. *For example, find the points of intersection between the line* $y = -3x$ *and the circle* $x^2 + y^2 = 3$.	**Algebra 1 Lesson coverage** 3.13, 8.10–8.11
A-REI.8 (+) Represent a system of linear equations as a single matrix equation in a vector variable.	**Algebra 2 Lesson coverage** 4.3, 4.8
A-REI.9 (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	**Algebra 2 Lesson coverage** 4.8

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Represent and solve equations and inequalities graphically	
A-REI.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a straight line).	**Algebra 1 Lesson coverage** 3.10–3.11, 3.13, 6.14 **Algebra 2 Lesson coverage** 2.2, 2.5–2.7, 5.7, 5.14, 6.2–6.4, 8.7–8.8 **Precalculus Lesson coverage** 6.2, 6.4, 6.6, 6.7, 6.8
A-REI.11 Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*	**Algebra 1 Lesson coverage** 3.13, 4.14, 8.10 **Algebra 2 Lesson coverage** 2.6–2.7, 2.12 Ex. 5, 5.7, 5.14 **Precalculus Lesson coverage** 3.3, 3.5, 3.12, 6.1
A-REI.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	**Algebra 1 Lesson coverage** 8.11 **Algebra 1 Standards Activity** After Lesson 8.11, use Activity Alg 1-1, *Systems of Linear Inequalities*, to graph the solution of a system of linear inequalities as the intersection of the corresponding half-planes.
Functions	
Interpreting Functions	
Understand the concept of a function and use function notation	
F-IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then $f(x)$ denotes the output of *f* corresponding to the input *x*. The graph of f is the graph of the equation $y = f(x)$.	**Algebra 1 Lesson coverage** 5.1, 5.3–5.4 **Algebra 2 Lesson coverage** 2.2
F-IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	**Algebra 1 Lesson coverage** 5.4–5.12, throughout remainder of chapter 5, and chapters 6–8 **Algebra 2 Lesson coverage** 2.2, 2.3 **Precalculus Lesson coverage** *Used throughout text* including trigonometric functions in Chapter 1, polynomial, rational, exponential, logarithmic in Chapter 3
F-IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by* $f(0) = f(1) = 1$, $f(n + 1) = f(n) + f(n - 1)$ *for* $n \geq 1$.	**Algebra 1 Lesson coverage** 5.7, 5.8, 6.4, 6.15 **Algebra 2 Lesson coverage** 1.1, 1.2, 1.11, 7.1 **Precalculus Lesson coverage** 5.11–5.14

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Interpret functions that arise in applications in terms of the context	
F-IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**	**Algebra 1 Lesson coverage** 5.5, 5.6, 5.9, 6.14, 8.6–8.8 **Algebra 2 Lesson coverage** 5.7, 5.14, 6.1–6.4, 8.6–8.8 **Precalculus Lesson coverage** 1.11–1.13, 3.1–3.5, 3.7, 3.14
F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.**	**Algebra 1 Lesson coverage** 8.6 **Algebra 2 Lesson coverage** 2.2
F-IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*	**Algebra 1 Lesson coverage** 4.3, 4.4, 4.15 **Algebra 2 Lesson coverage** 1.3, 1.4 **Precalculus Lesson coverage** 1.5, 3.3, 3.5, 3.10
Analyze functions using different representations	
F-IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*	**Algebra 1 Lesson coverage** 3.15–3.17, 4.6, 4.7, 5.6, 6.13, 6.14, 8.6–8.8, 8.10 **Algebra 2 Lesson coverage** 2.5, 2.7, 5.7, 5.14, 6.1–6.4, 8.7, 8.8 **Precalculus Lesson coverage** 1.3, 1.8–1.13, 2.2, 2.4, 3.1–3.3, 3.5–3.7, 3.10, 3.13
F-IF.7.a Graph linear and quadratic functions and show intercepts, maxima, and minima.	**Algebra 1 Lesson coverage** 3.15–3.17, 4.6, 4.7, 5.6, 8.7, 8.8, **Algebra 2 Lesson coverage** 6.1–6.4
F-IF.7.b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	**Algebra 1 Lesson coverage** 3.16–3.17 **Algebra 2 Lesson coverage** 2.2, 2.4 **Algebra 2 Standards Activity** After Investigation 6A, use Activity Alg 2-1, *More Basic Graphs*, to graph cube root and step functions.
F-IF.7.c Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	**Algebra 1 Lesson coverag** 8.6–8.8 **Algebra 2 Lesson coverage** 2.5, 2.7, 6.2–6.4 **Precalculus Lesson coverage** 3.1–3.5
F-IF.7.d (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.	**Algebra 2 Lesson coverage** 6.1 **Precalculus Lesson coverage** 3.6–3.9

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F-IF.7.e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	**Algebra 1 Lesson coverage** 6.13, 6.14 **Algebra 2 Lesson coverage** 5.7, 5.14, 8.7, 8.8 **Precalculus Lesson coverage** 3.10–3.14, 1.11–1.13
F-IF.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	**Algebra 1 Lesson coverage** 5.1 Ex. 10, 5.6 Ex. 4,6, 6.14 Ex. 5, 7.1, 7.2 **Precalculus Lesson coverage** 3.1, 3.2, 3.4, 5.3, 5.9
F-IF.8.a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	**Algebra 1 Lesson coverage** 7.12, 8.6, 8.7, 8.8 **Algebra 2 Lesson coverage** 6.7
F-IF.8.b Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as* $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, *and classify them as representing exponential growth or decay.*	**Algebra 1 Lesson coverage** 6.12–6.15 **Algebra 2 Lesson coverage** 5.8–5.10
F-IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	**Algebra 1 Lesson coverage** 5.5, 5.6, 5.9, 8.6–8.8
Building Functions	
Build a function that models a relationship between two quantities	
F-BF.1 Write a function that describes a relationship between two quantities.*	**Algebra 1 Lesson coverage** 5.8, 5.9, 5.12, Ch. 5 Project, 6.13–6.14 **Algebra 2 Lesson coverage** 1.11, 1.12, 2.2, 5.7–5.9, 7.9 **Precalculus Lesson coverage** Throughout Chapters 1, 3, 5, 8
F-BF.1.a Determine an explicit expression, a recursive process, or steps for calculation from a context.	**Algebra 1 Lesson coverage** 5.2, 5.3, 5.5, 5.9, 5.12 **Algebra 2 Lesson coverage** 1.11, 5.7–5.9, 7.9 **Precalculus Lesson coverage** 1.13, 5.2, 5.10 Ex. 5, 7.1, 7.3, 7.4
F-BF.1.b Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*	**Algebra 2 Lesson coverage** 2.6, 2.7

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F-BF.1.c (+) Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.*	**Algebra 2 Lesson coverage** 2.1, 2.2 **Precalculus Lesson coverage** 1.9, 3.14
F-BF.2 Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*	**Algebra 1 Lesson coverage** 5.8, 5.9, 6.15 **Algebra 2 Lesson coverage** 1.2–1.4, 5.6, 7.9–7.11 **Precalculus Lesson coverage** 5.1, 5.2, 5.4, 5.5, 5.7
Build new functions from existing functions	
F-BF.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*	**Algebra 1 Lesson coverage** 3.14–3.17 **Algebra 2 Lesson coverage** 6.1, 6.3, 6.4 **Precalculus Lesson coverage** 1.3, 1.11–1.13, 3.1, 3.3
F-BF.4 Find inverse functions.	**Algebra 1 Lesson coverage** 5.4 Ex. 12 **Algebra 2 Lesson coverage** 2.4 **Precalculus Lesson coverage** 1.9, 3.13, 3.14
F-BF.4.a Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. *For example,* $f(x) = 2x^3$ *for* $x > 0$ *or* $f(x) = (x + 1)/(x - 1)$ *for* $x \neq 1$.	**Algebra 2 Lesson coverage** 2.4 **Precalculus Lesson coverage** 1.9, 3.14
F-BF.4.b (+) Verify by composition that one function is the inverse of another.	**Algebra 2 Lesson coverage** 2.4 **Precalculus Lesson coverage** 1.9, 3.14
F-BF.4.c (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.	**Algebra 2 Lesson coverage** 2.4 **Precalculus Lesson coverage** 1.9, 3.13, 3.14
F-BF.4.d (+) Produce an invertible function from a non-invertible function by restricting the domain.	**Algebra 2 Lesson coverage** 2.4
F-BF.5 (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	**Algebra 2 Lesson coverage** 5.12–5.14 **Precalculus Lesson coverage** 3.13, 3.14

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Linear and Exponential Models*	
Construct and compare linear and exponential models and solve problems.	
F-LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.	**Algebra 1 Lesson coverage** 5.9, 6.14 **Algebra 2 Lesson coverage** 5.6
F-LE.1.a Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	**Algebra 1 Lesson coverage** 5.8, 6.15 **Algebra 2 Lesson coverage** 1.3, 1.4, 5.6, 5.8
F-LE.1.b Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	**Algebra 1 Lesson coverage** 6.15 **Algebra 2 Lesson coverage** 1.3, 1.4
F-LE.1.c Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	**Algebra 1 Lesson coverage** 6.15 **Algebra 2 Lesson coverage** 5.8–5.10 **Precalculus Lesson coverage** 3.11
F-LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	**Algebra 1 Lesson coverage** 4.4, 4.6, 4.7, 5.6, 5.9, 6.13–6.15 **Algebra 2 Lesson coverage** 1.4, 5.7–5.10, 7.9–7.11
F-LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	**Algebra 1 Lesson coverage** 6.14 **Algebra 2 Lesson coverage** 5.10
F-LE.4 For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	**Algebra 2 Lesson coverage** 5.12, 5.13 **Precalculus Lesson coverage** 3.13
Interpret expressions for functions in terms of the situation they model	
F-LE.5 Interpret the parameters in a linear or exponential function in terms of a context.	**Algebra 1 Lesson coverage** 4.8, 4.10, 6.13 **Precalculus Lesson coverage** 3.13
Trigonometric Functions	
Extend the domain of trigonometric functions using the unit circle	
F-TF.1 Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	**Precalculus Lesson coverage** 1.1, 1.2
F-TF.2 Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	**Precalculus Lesson coverage** 1.1–1.3

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
F-TF.3 (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for x, $\pi + x$, and $2\pi - x$ in terms of their values for x, where x is any real number.	**Algebra 2 Lesson coverage** 8.1–8.3 **Precalculus Lesson coverage** 1.1–1.3, 1.5, 1.7, 1.8
F-TF.4 (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	**Algebra 2 Lesson coverage** 8.4 **Precalculus Lesson coverage** 1.3, 1.4, 1.7, 1.8
Model periodic phenomena with trigonometric functions	
F-TF.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.*	**Precalculus Lesson coverage** 1.11, 1.13
F-TF.6 (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.	**Precalculus Lesson coverage** 1.9
F-TF.7 (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.*	**Algebra 2 Lesson coverage** 8.4, 8.5, 8.7, 8.8 **Precalculus Lesson coverage** 1.4, 1.9, 1.11, 1.12, 1.13
Prove and apply trigonometric identities	
F-TF.8 Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.	**Algebra 2 Lesson coverage** 8.4 **Precalculus Lesson coverage** 1.4, 1.10, 2.5, 2.7
F-TF.9 (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	**Algebra 2 Lesson coverage** 8.9 **Precalculus Lesson coverage** 2.6
Geometry	
Congruence	
Experiment with transformations in the plane	
G-CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	**Geometry Lesson coverage** 1.8, 2.2, 7.7, 7.8, Ch. 7 Project
G-CO.2 Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	**Geometry Lesson coverage** 4.2, 4.16, 7.1–7.4, 7.5 Ex. 11

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
G-CO.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	**Geometry Standards Activity** After Lesson 7.4, have students use Activity Geo-1, *Symmetry*, to describe the rotations and reflections that carry a figure onto itself.
G-CO.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	**Geometry Lesson coverage** 7.2–7.4
G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	**Geometry Lesson coverage** 7.2–7.4, 7.5 Ex. 11
Understand congruence in terms of rigid motions	
G-CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	**Geometry Lesson coverage** 2.1, 2.2
G-CO.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	**Geometry Lesson coverage** 2.4
G-CO.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	**Geometry Lesson coverage** 2.4
Prove geometric theorems	
G-CO.9 Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*	**Geometry Lesson coverage** 2.6, 2.7, 2.14
G-CO.10 Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*	**Geometry Lesson coverage** 1.5, 1.6, 1.11, 2.8, 2.14, 2.19, 3.5, 6.4

Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
G-CO.11 Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other and conversely, rectangles are parallelograms with congruent diagonals.*	**Geometry Lesson coverage** 2.18, 2.19
Make geometric constructions	
G-CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*	**Geometry Lesson coverage** 1.6
G-CO.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	**Geometry Lesson coverage** 1.9, 5.3
Similarity, Right Triangles, and Trigonometry	
Understand similarity in terms of similarity transformations	
G-SRT.1 Verify experimentally the properties of dilations given by a center and a scale factor:	**Geometry Lesson coverage** 4.7, 4.8
G-SRT.1.a A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.	**Geometry Lesson coverage** 4.8
G-SRT.1.b The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	**Geometry Lesson coverage** 4.2, 4.8
G-SRT.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of side	**Geometry Lesson coverage** 4.3, 4.4, 4.7, 4.8, 4.14, 4.15
G-SRT.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	**Geometry Lesson coverage** 4.15

Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Prove theorems involving similarity	
G-SRT.4 Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally and conversely; the Pythagorean Theorem proved using triangle similarity.*	**Geometry Lesson coverage** 4.11, 4.12, 6.3
G-SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	**Geometry Lesson coverage** 4.15, 6.1–6.3
Define trigonometric ratios and solve problems involving right triangles	
G-SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	**Geometry Lesson coverage** 6.7 **Algebra 2 Lesson coverage** 8.0
G-SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.	**Algebra 2 Lesson coverage** 8.0 **Precalculus Lesson coverage** 1.9 Ex. 9, 1.10, 2.6, 2.7
G-SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	**Geometry Lesson coverage** 3.10, 3.1, 6.5–6.8 **Algebra 2 Lesson coverage** 8.0
Apply trigonometry to general triangles	
G-SRT.9 (+) Derive the formula $A = 1/2\ ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	**Geometry Lesson coverage** 6.8 **Algebra 2 Lesson coverage** 8.10, 8.11
G-SRT.10 (+) Prove the Laws of Sines and Cosines and use them to solve problems.	**Geometry Lesson coverage** 6.9 **Algebra 2 Lesson coverage** 8.12, 8.13
G-SRT.11 (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	**Geometry Lesson coverage** 6.9 **Algebra 2 Lesson coverage** 8.12, 8.13
Circles	
Understand and apply theorems about circles	
G-C.1 Prove that all circles are similar.	**Geometry Standards Activity** Before Investigation 5A, have students use Activity Geo-2, *Similarity and Circles*, to prove that all circles are similar.

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G-C.2 Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*	**Geometry Lesson coverage** 1.11, 5.7, 5.9, 5.10
G-C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	**Geometry Standards Activity** After Lesson 5.9, have students use Activity Geo-3, *Inscribed and Circumscribed Circles*, to Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
G-C.4 (+) Construct a tangent line from a point outside a given circle to the circle.	**Geometry Lesson coverage** 5.10
Find arc lengths and areas of sectors of circles	
G-C.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	**Geometry Lesson coverage** 5.5 **Precalculus Standards Activity** Before Lesson 1.2, have students draw two concentric circles, and a central angle that intercepts arcs in both circles. Ask, "What similar two-dimensional figures are there in the drawing?" [The two circles are similar, and the two sectors formed by the central angle are similar.] Let one radius be r_1, and the other be x. There are two arcs intercepted by the central angle. Let the arc on the circle with radius r_1 have length a_1, and let the arc on the circle with radius x have length a_2. Ask students to use what they know about similar figures to set up a proportion involving the lengths of the radii and the arc lengths. [Answer may vary. Samples: $\frac{x}{r_1} = \frac{a_2}{a_1}$, $\frac{x}{a_2} = \frac{r_1}{a_1}$] Then ask students to find the value of a_2 in terms of a number times x. [$a_2 = \frac{a_1}{r_1}x$] Ask students to describe how the number $\frac{a_1}{r_1}$ changes as the central angle increases. [$\frac{a_1}{r_1}$ increases as the central angle increases.] This gives a way to measure the central angle in terms of the radius and arc length of the intercepted arc. The *radian* measure of an angle is defined by this number.
Expressing Geometric Properties with Equations	
Translate between the geometric description and the equation for a conic section	
G-GPE.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	**Geometry Lesson coverage** Ch. 7 project **Precalculus Lesson coverage** 6.4

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
G-GPE.2 Derive the equation of a parabola given a focus and directrix.	**Precalculus Lesson coverage** 6.2, 6.7, 6.9
G-GPE.3 (+) Derive the equations of ellipses and hyperbolas given foci and directrices.	**Precalculus Lesson coverage** 6.7, 6.8, 6.9
Use coordinates to prove simple geometric theorems algebraically	
G-GPE.4 Use coordinates to prove simple geometric theorems algebraically. *For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, $\sqrt{3}$) lies on the circle centered at the origin and containing the point (0, 2).*	**Geometry Lesson coverage** 7.6, 7.8 **Precalculus Lesson coverage** 6.2, 6.3
G-GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	**Algebra 1 Lesson coverage** 4.11 **Geometry Lesson coverage** 7.7, 7.8
G-GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	**Geometry Lesson coverage** 7.6 **Precalculus Lesson coverage** 6.11–6.13
G-GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*	**Geoemetry Lesson coverage** 7.6, 7.8
Geometric Measurement and Dimension	
Explain volume formulas and use them to solve problems	
G-GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*	**Geometry Lesson coverage** 3.12, 3.13, 3.15, 5.2, 5.3, 6.11, 6.12
G-GMD.2 (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	**Geometry Lesson coverage** 6.11–6.13
G-GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*	**Geometry Lesson coverage** 3.15, 6.11–6.13
Visualize relationships between two-dimensional and three-dimensional objects	
G-GMD.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	**Geometry Lesson coverage** 1.0, 6.11 **Precalculus Lesson coverage** 6.5, 6.6

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Modeling with Geometry	
Apply geometric concepts in modeling situations	
G-MG.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*	**Geometry Lesson coverage** 3.15
G-MG.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).*	**Geometry Lesson coverage** 4.16
G-MG.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*	**Geometry Lesson coverage** 8.5, 8.6
Statistics and Probability ***All standards in this section have a close relation to modeling**	
Interpreting Categorical and Quantitative Data	
Summarize, represent, and interpret data on a single count or measurement variable	
S-ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).	**Algebra 1 Lesson coverage** 3.7, 3.8 **Precalculus Lesson coverage** 7.11, 7.12 **Algebra 1 Standards Activity** Have students use Activity Alg 1-2, *Dot Plots*, after Lesson 3.7 to represent date using dot plots.
S-ID.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	**Algebra 1 Lesson coverage** 3.6, 3.8 **Precalculus Lesson coverage** 7.7
S-ID.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	**Algebra 1 Lesson coverage** 3.9
S-ID.4 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	**Precalculus Lesson coverage** 7.11–7.13

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Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Summarize, represent, and interpret data on two categorical and quantitative variables	
S-ID.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	**Precalculus Standards Activity** After Investigation 7A, have students use Activity Precalc-2, *Two-Way Frequency Tables*, to extend concepts regarding two-way frequency tables.
S-ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	**Algebra 1 Lesson coverage** 3.9 **Algebra 2 Lesson coverage** 1.6–1.9
S-ID.6.a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.*	**Algebra 1 Lesson coverage** 3.9, 4.15 **Algebra 2 Lesson coverage** 1.6–1.9
S-ID.6.b Informally assess the fit of a function by plotting and analyzing residuals.	**Algebra 2 Lesson coverage** 1.6–1.9
S-ID.6.c Fit a linear function for a scatter plot that suggests a linear association.	**Algebra 1 Lesson coverage** 4.15 **Algebra 2 Lesson coverage** 1.6–1.9
Interpret linear models	
S-ID.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	**Algebra 1** 4.3, 4.8, 4.15
S-ID.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.	**Algebra 2 Lesson coverage** 1.8–1.9
S-ID.9 Distinguish between correlation and causation.	**Algebra 1 Standards Activity** Have students use Activity Alg 1-3, *Correlation and Causation*, after Lesson 4.15 to distinguish between correlation and causation.
Making Inferences and Justifying Conclusions	
Understand and evaluate random processes underlying statistical experiments	
S-IC.1 Understand statistics as a process for making inferences to be made about population parameters based on a random sample from that population.	**Precalculus Lesson coverage** 7.6, Ch. 7 Project
S-IC.2 Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*	**Precalculus Lesson coverage** 7.1, 7.9, Ch. 7 Project

Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
Make inferences and justify conclusions from sample surveys, experiments, and observational studies	
S-IC.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	**Algebra 1 Standards Activity** After Investigation 3B, have students use Activity Alg 1-4, *Surveys, Experiments, and Observational Studies*, to see how statistical methods can be used to draw conclusions.
S-IC.4 Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	**Precalculus Lesson coverage** 7.6, Ch. 7 Project **Precalculus Standards Activity** After Investigation 7B, have students use Activity Precalc-3, *Analyzing Samples and Surveys*, to use sample surveys to draw conclusions about populations, and to learn the limits of those conclusions.
S-IC.5 Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	**Algebra 1 Standards Activity** After Investigation 3B, have students use Activity Alg 1-5, *Experiment and Simulations*, to use data from a randomized experiment to compare two treatments.
S-IC.6 Evaluate reports based on data.	**Precalculus Lesson coverage** 7.13 Ex. 9–10
Conditional Probability and the Rules of Probability	
Understand independence and conditional probability and use them to interpret data	
S-CP.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	**Precalculus Lesson coverage** 7.2
S-CP.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	**Precalculus Lesson coverage** 7.2
S-CP.3 Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.	**Precalculus Standards Activity** After Investigation 7A, have students use Activity Precalc-1, *Conditional Probability*, to understand conditional probability.

Common Core State Standards for High School	Meeting the Common Core State Standards with Pearson's *CME Project*
S-CP.4 Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*	**Precalculus Standards Activity** After Investigation 7A, have students use Activity Precalc-2, *Two-Way Frequency Tables*, to extend concepts regarding two-way frequency tables.
S-CP.5 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. *For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*	**Precalculus Standards Activity** After Investigation 7A, have students use Activity Precalc-1, *Conditional Probability*, to understand conditional probability in everyday contexts.
Use the rules of probability to compute probabilities of compound events in a uniform probability model	
S-CP.6 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.	**Precalculus Standards Activity** After Investigation 7A, have students use Activity Precalc-1, *Conditional Probability*, to understand conditional probability.
S-CP.7 Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.	**Precalculus Lesson coverage** 7.2
S-CP.8 (+) Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B\|A) = P(B)P(A\|B)$, and interpret the answer in terms of the model.	**Precalculus Standards Activity** After Investigation 7A, have students use Activity Precalc-1, *Conditional Probability*, to apply the Multiplication Rule in a uniform probability model.
S-CP.9 (+) Use permutations and combinations to compute probabilities of compound events and solve problems.	**Precalculus Lesson coverage** 7.2, 7.3, 7.4, 7.9, 7.10
Using Probability to Make Decisions	
Calculate expected values and use them to solve problems	
S-MD.1 (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.	**Precalculus Lesson coverage** 7.2, 7.4, 7.12
S-MD.2 (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.	**Precalculus Lesson coverage** 7.4, 7.5

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S-MD.3 (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. *For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.*	**Precalculus Lesson coverage** 7.4, 7.6, 7.9, 7.10
S-MD.4 (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. *For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?*	**Precalculus Lesson coverage** 7.6, 7.7 Ex. 6
Use probability to evaluate outcomes of decisions	
S-MD.5 (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.	**Precalculus Lesson coverage** 7.4, 7.5
S-MD.5.a Find the expected payoff for a game of chance. *For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant.*	**Precalculus Lesson coverage** 7.4, 7.5
S-MD.5.b Evaluate and compare strategies on the basis of expected values. *For example, compare a high-deductible versus a low deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.*	**Precalculus Lesson coverage** 7.6 Ex. 4, 7.8 Ex. 10, 7.10 Ex. 10–13
S-MD.6 (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	**Precalculus Lesson coverage** 7.1, 7.2
S-MD.7 (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	**Precalculus Lesson coverage** 7.5

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