Proportional Reasoning
Navigation Tool

These Are Skills, Problems, and Ideas
Students Are Expected to Develop the Skills, Solve Similar Problems, and Understand the Ideas

Independent Skills
I can identify features of similar shapes. I can identify the scale between similar shapes. I can use tools to assist in the analysis of similar shapes (with a cartesian plane, with tools, with a grid).
Identify corresponding sides and angles.
Calculate sizes of scaled objects.
Create scale drawings of specific sizes.

Basic	Intermediate	Advanced
I can measure angles from $0°\ to\ 360°$ I can draw angles from $0°\ to\ 360°$		
Measure from $0°\ to\ 180°$	*Measure from* $180°\ to\ 360°$ *Draw from* $0°\ to\ 180°$	*Draw from* $180°\ to\ 360°$
I can draw scalene triangles given measurements.		
Draw given 3 angles. Draw given 1 length and 2 angles	Draw given 1 lengths and 2 angles.	Draw given 3 lengths.

Independent Skills
I can draw right angle triangles and identify features.
Draw a right triangle given an angle.
Identify opposite, hypotenuse, and adjacent sides of right triangle given a reference angle.
Measure the lengths of a right triangle.

Basic	Intermediate	Advanced
I can draw right triangles with specific features.		
Draw right triangle given two of the sides (opp-adj)	Draw right triangle given two of the sides (adj-hyp)	Draw right triangle given two of the sides (opp-hyp)
I can calculate trigonometric ratios for right triangles. I can draw similar right triangles and show their trigonometric ratios are the same. I can analyze trigonometric tables. I can estimate trigonometric values of given right triangles.		
Calculate $\sin\theta = \frac{opp}{hyp}, \cos\theta = \frac{adj}{hyp}, \tan\theta = \frac{opp}{adj}$ for a right triangle.		
Estimate $\sin\theta, \cos\theta, or \tan\theta$ values of for right triangles with given angle.		
Recreate right triangle with given $\sin\theta, \cos\theta, or \tan\theta$ value.		
Recreate right triangle with given opp, adj, or hyp, and given $\sin\theta, \cos\theta, or \tan\theta$ value.		
Draw two similar right triangles given an angle. Show $\sin\theta, \cos\theta, \tan\theta$ are same for both.		

Polynomials
Navigation Tool

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Basic	Intermediate	Advanced
I can identify polynomials		
Identify algebraic tiles by shape and size.	Identify algebraic tiles by shape, size, and color.	Identify algebraic expressions for tile models with multiple variables.
I can model algebraic expressions using algebra tiles		
Model algebraic expressions with 1 term	Model algebraic expressions with 2 terms.	Model algebraic expressions with 3 terms.
I can add polynomials.		
Model the addition of monomials.	Model the addition of binomials.	Model the addition of trinomials.
I can multiply polynomials.		
Model the multiplication of monomials.	Model the multiplication of a monomial by a binomial with positive terms	Model the multiplication of a monomial by a binomial including negative terms
I can subtract polynomials.		
Model the subtraction of monomials algebraically.	Model the subtraction of a monomial from a binomial algebraically.	Model the subtraction of a binomial from a binomial algebraically.
I can divide polynomials.		
Model the division of a monomial by a monomial.	Model the division of a binomial by a monomial with positive terms.	Model the division of a binomial by a monomial including negative terms.
I can create algebraic expressions and simplify them.		

Exponents
Navigation Tool

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Independent Skills
I can identify the structure of an exponential expressions
$2^7 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$
$2 \times 10^3 = 2000$
$-(-2)^3 = -1 \cdot -2 \cdot -2 \cdot -2$

Basic	Intermediate	Advanced
I can express whole numbers using different bases		
Express a number in base 2	Express the same number in base 2 and base 3	Express the same number in any base
I can multiply exponential expressions		
$2^5 \times 2^3$	$2mn^5 \times 4mn^3$	$(2x)(4x^2 - 5y^2)$
I can divide exponential expressions		
$\dfrac{2^7}{2^3}\dfrac{y^7}{y^3} = 2^4 y^4$	$\dfrac{y^7}{y^3} = y^4$	$\dfrac{2^7 y^7}{2^3 y^3} = 2^4 y^4$
I can simplify chained exponential expressions.		
$(3^2)^2 = 3^4$	$(2m^2)^3 = 2^3 m^6$	$(5n^2)^4 = 5^4 n^8$
I can author and simplify clear exponential expressions.		
$12 = (9 + 3) = \left(9 + \left(\frac{6}{2}\right)\right) = \left(3^2 + \left(\frac{6}{2}\right)\right)$	$\left(\dfrac{((-2)^4)}{(4^2)}\right)$	$1 - 2 \times \left(\dfrac{4}{5}\right)^2$
I can create complex exponential expressions and simplify them.		

Two Variable Linear Equations
Navigation Tool

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Independent Skills
I can plot coordinates on the cartesian plane.
Plot coordinates (x, y)

Basic	Intermediate	Advanced
I can plot a pattern given on a table of values on a cartesian plane.		
Given plottable data points i.e. (1, 5), (2, 7), (3, 9)	Given data that needs to be extended i.e. (1, 50), (2, 40), (3, 30)	Given data that needs to be analyzed i.e. (4, 34), (6, -16), (8, -66)

Patterns			
	Basic	Intermediate	Advanced
	I can analyze the first few iterations of a pattern, i.e. f(1), f(2), f(3), f(4), f(5), f(6), f(7).	I can extend a pattern to describe unknown values, i.e. f(10), f(15), f(20), f(50), f(100).	I can describe a pattern using a 'hack', a verbal description, a written description, or a function, i.e. f(x).
A physical pattern.			
A numerical pattern			
A described pattern.			
Collected data.			
I can analyze data that I collect for the linear relationships that may exist, i.e. $f(x) \sim mx + b$			

One Variable Linear Equations
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Basic	Intermediate	Advanced
I can solve linear equations in standard form.		
Day 1: $x + 5 = 9$	Day 1: $2x = 4$	Day 2: $2x + 5 = 9$
I can perform algebraic technique to solve linear equations in standard form.		
Day 2: $2x - 5 = 9$	Day 3: $2x - 5 = -3x$	Day 3: $-2x - 20 = 3x + 9$
I can perform algebraic technique to solve linear equations that require distribution.		
Day 4: $3(x + 1) = 12$	Day 4: $2(x - 10) + 6 = -14$	Day 5: $5(2 - 3x) = 5(-3x + 2)$
I can perform algebraic technique to solve linear equations that include rational numbers.		
Day 5: $\frac{x}{4} + 10 = 1$	Day 6: $2 - \frac{3}{4}x = -\frac{3}{2}x - 1$	Day 6: $\frac{1}{3}x - 4 = \frac{1}{2}x - 5$
I can confirm correctness of solutions by evaluating. I can solve problems using algebraic techniques		

Rational Numbers
Navigation Tool

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Basic	Intermediate	Advanced
I can represent whole numbers 'n' with factorizations I can utilize factors to reduce computational complexity.		
Day 7: $n = 55$	Day 7: $n = \frac{55 \times 7}{35}$	Day 8: $n = \frac{375}{30}$
I can multiply rational numbers I can describe multiplication of rational numbers using scale and stretch		
Day 8: $n = \frac{3}{4} \times \frac{5}{5}$	Day 9: $n = \frac{3}{4} \times \frac{4}{5}$	Day 9: $n = 0.4 \times 0.28$
I can divide rational numbers I can describe division of rational numbers using partitions.		
Day 10: $n = \frac{2}{4} \div \frac{1}{4}$	Day 10: $n = \frac{10}{4} \div \frac{2}{8}$	Day 11: $n = \frac{5}{2} \div \frac{7}{3}$
I can add/subtract rational numbers I can use addition and subtraction to describe the space between numbers.		
Day 11: $n = \frac{5}{12} + \frac{3}{12}$	Day 12: $n = \frac{5}{8} + \left(\frac{7}{2}\right)$	Day 12: $n = \left(\frac{1}{2}\right) + \left(\frac{1}{7}\right)$
I can use brackets to communicate my intentions I can interpret someone else's operational intentions.		
Day 13: $n = (2 \times 3) + (4 \times 5)$	Day 13: $n = \frac{1}{2} + \left(\frac{3}{4} \times \frac{1}{3}\right)$	Day 14: $n = \left(\frac{-2}{5}\right) \div \left(\left(\frac{-1}{8}\right) + \left(\frac{9}{2} \times \left(\frac{-6}{7}\right)\right)\right)$
I can order rational numbers I can represent and describe the space between rational numbers.		
Day 15: $\frac{3}{5}$ *and* $\frac{4}{5}$	Day 15: $\frac{3}{5}$ *and* $\frac{4}{5}$	Day 15: $\frac{3}{5}$ *and* $\frac{4}{5}$