

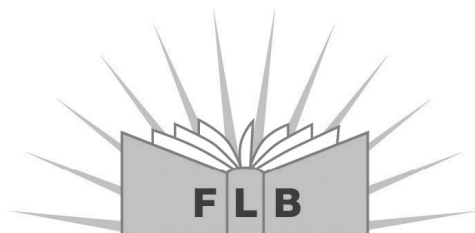
TEACHER RESOURCE EDITION

EDUREALM SERIES

A Standards-Based Resource

MATHEMATICS

LEVEL H



Firelight Books

SAMPLE
EDUREALM H

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Curriculum Matrix

The Curriculum Matrix is based on the twelve areas of the National Council of Teachers of Mathematics standards. The areas are Algebra, Data Interpretation, Decimals, Fractions, Functions, Geometry, Mathematics Process, Measurement, Number Theory, Numeration, Technology, and Whole Numbers.

Each area of the standard, labeled a standard, is defined, competencies are identified, and specific skills that address the competency listed are for each level. A ● notation on the matrix signifies that the specific skill is directly addressed. A ○ notation on the matrix signifies that the skill is contained under another heading in the matrix.

Algebra

Readiness

	PK	K	A-1	B-2	C-3	D-4	E-5	F-6	G-7	H-8
Missing Numbers and Number Sentences			●	●	●	●	●	●		
Order of Operations					●	●	●	●	●	●
Multiple Steps (see Mathematical Process)			○	○	○	○	○	○	○	○
Number Lines										
Whole Numbers	●	●	●	●	●					
Exponents and Powers						●	●	●	●	●
Scientific Notation										
Positive Powers of 10									●	●
Negative Powers of 10										●
Squares and Square Roots									●	●

Operations

Variables							●	●	●	●
Writing Equations				●	●	●	●	●	●	●
Integers (Negative/Positive)										
Define						●	●	●	●	●
Compare/Order							●	●	●	●
Addition/Subtraction							●	●	●	●
Multiplication/Division							●	●	●	●
Solve One-Step Equations										
Addition/Subtraction						●	●	●	●	●
Multiplication/Division							●	●	●	●
Input/Output Tables			●	●	●	●	●	●	●	●

Algebra/Operations, cont.

	PK	K	1	2	3	4	5	6	7	8
Solve Two-Step Equations									●	●
Solve Equations with Two Variables									●	●
Inequalities									●	●
Formulas									●	●
Rational Numbers: Identify/Simplify								○	○	●
Polynomials										
Represent/Simplify										●
Adding										●
Subtracting										●
Multiplying Monomials and Binomials										●
Factoring										●
Coordinate Graphing										
Coordinates in Four Quadrants						○	○	●	●	●
Equations (see Functions)									○	○
Inequalities										●
Slope									○	●

Data Interpretation**Readiness**

Pictographs	●	●	●	●	●	●	●	●	●	●
Bar Graphs	●	●	●	●	●	●	●	●	●	●
Line Graphs					●	●	●	●	●	●
Line Plots				●			●	●	●	●
Double Line Graphs									●	●
Circle Graphs					●	●	●	●	●	●
Stem and Leaf Diagrams						●	●	●	●	●
Box Diagrams (Box and Whisker)								●	●	●
Scatter Plots						●	●	●	●	●

Collection

Tally Charts			●	●	●	●				
Tally Chart and Frequency Distribution							●	●	●	●
Mean, Median, Mode, Range						●	●	●	●	●
Sampling							●	●	●	●

Probability

Predicting Outcomes				●	●	●	●	●	●	●
Probabilities	●	●	●	●	●	●	●	●	●	●

Decimals

Concepts

	PK	K	1	2	3	4	5	6	7	8
Meaning of Decimals					●	●	●	●		
Compare/Order					●	●	●	●	●	●
Related to Fractions					●	●	●	●	●	●
Related to Percent								●	●	●
Related to Money				●	●	●	●	●		
Place Value					●	●	●	●	●	●
Rounding					●	●	●	●	●	●

Operations

Addition					●	●	●	●	●	●
Subtraction					●	●	●	●	●	●
Multiplication							●	●	●	●
Division										
Whole Number Divisor							●	●	●	●
Decimal Divisor								●	●	●
Repeating Decimals/Terminating Decimals									●	●
Estimate							●	●	●	●

Fractions

Concepts

Part of a Whole/Part of a Set	●	●	●	●	●	●	●	●		
Lowest Terms/Simplest Forms					●	●	●	●	●	●
Compare/Order			●	●	●	●	●	●	●	●
Rounding/Estimate						●	●	●	●	●
Related to Decimals					●	●	●	●	●	●
Related to Percent							●	●	●	●
Least Common Denominator (LCD)						●	●	●	●	●
Equivalent Fractions					●	●	●	●	●	●
Mixed Numbers					●	●	●	●		
Related to Improper Fractions						●	●	●	●	●

Operations

Addition										
Like Denominators					●	●	●	●	●	●
Unlike Denominators						●	●	●	●	●
Mixed Numbers						●	●	●	●	●

Fractions/Operations, cont.

	PK	K	1	2	3	4	5	6	7	8
Subtraction										
Like Denominators					●	●	●	●	●	●
Unlike Denominators						●	●	●	●	●
Mixed Numbers						●	●	●	●	
Regrouping							●	●		
Mixed Numbers with Regrouping									●	●
Multiplication										
Simple Fractions						●	●	●	●	●
Mixed Numbers							●	●	●	●
Simplify								●	●	●
Division										
Reciprocals							●	●	●	●
Whole Numbers							●	●		
Mixed Numbers							●	●	●	●
Solve Equations								●	●	●

Functions**Relationships**

Tables				●	●	●	●	●	●	●
Ordered Pairs					●	●	●	●	●	●
Line Graphs (see Data Interpretation)					○	○	○	○	○	○
Venn Diagrams				●	●	●	●	●	●	●
Graphing Equations									●	●

Geometry**Concepts**

Segments/Rays					●	●	●	●	●	●
Angles										
Classify					●	●	●	●	●	●
Measuring					●	●	●	●	●	●
Complementary/Supplementary									●	●
Vertical/Corresponding/Alternative Interior									●	●

Geometry/Concepts, cont.

	PK	K	1	2	3	4	5	6	7	8
Lines										
Parallel						●	●			
Perpendicular						●	●			
Parallel & Perpendicular								●	●	●
Symmetry			●	●	●	●	●	●	●	●
Skew									●	●
Congruence			●	●	●	●	●	●	●	●
Sides, Corners, Vertices, Edges	●	●	●	●	●	●	●	●	●	●
Transformation (Slides, Turns, Flips)		●	●	●	●	●	●	●	●	●

Solid Shapes (Sphere, Cone, Cylinder, Cube, Pyramid, Prism)

Identify	●	●	●	●	●	●	●	●		
Sort/Classify	●	●	●	●	●	●	●	●		

Plane Shapes

Open and Closed						●	●	●	●	
Polygons (Quadrilaterals, Square, Pentagon, Hexagon, Octagon)			●	●	●	●	●	●	●	●
Triangles (Identify)	●	○	●	●	●					
Classify						●	●	●	●	●
Congruent								○	●	●
Parallelograms						●	●	●	●	●
Diagonals									●	●

Dimensional Shapes

Recognize by Given Specifications									●	●
Pythagorean Theorem									●	●

Mathematical Process**Problem Solving**

Choose an Operation	●	●	●	●	●	●	●	●	●	●
Multiple-Step Problems			●	●	●	●	●	●	●	●
Estimate					●	●	●	●	●	●
Make an Organized List		●	●	●	●	●	●	●	●	●
Make a Table (Personal Finance)		○	○	●	●	●	●	●	●	●
Information: Too Much/Too Little									●	

Mathematical Process, cont.

PK	K	1	2	3	4	5	6	7	8
----	---	---	---	---	---	---	---	---	---

Reasoning

Sequencing	●	●							
Classify		●	●	●	●	●	●	●	●
Compare/Contrast		●	●	●	●	●	●	●	●
Generalizations	○	●	●	●	●	●	●	●	●
Draw Conclusions		●	●	●	●	●	●	●	●
Visual Patterns (see Functions)	○	○	○	○	○	○	○	○	○
Reasoning	●	●	●	●	●	●	●	●	●

Computation Strategies

Multiply/Divide by Multiples and Powers of Ten								●	●
--	--	--	--	--	--	--	--	---	---

Measurement**Length/Height**

Nonstandard Units	●	●	●	●					
Customary Units			●	●	●	●	●	●	●
Metric Units			●	●	●	●	●	●	●

Capacity

Nonstandard Units	●	●	●	●					
Customary Units		●	●	●	●	●	●	●	●
Metric Units			●	●	●	●	●	●	●

Weight

Nonstandard Units	●	●	●	●					
Customary Units			●	●	●	●	●	●	●
Metric Units			●	●	●	●	●	●	●

Converting Metrics

								●	●
--	--	--	--	--	--	--	--	---	---

Temperature

Fahrenheit		○	●	●	●	●	●	●	●
Celsius					●	●	●	●	●
Convert								●	●

Area/Volume

Perimeter				●	●	●	●	●	●
Area		○		●	●	●	●	●	●
Volume						●	●	●	●
Surface Area							●	●	●
Circumference						●	●	●	●

Measurement/Volume, cont.

	PK	K	1	2	3	4	5	6	7	8
Circumference: Diameter/Radius								●	●	●

Time

Clock	●	●	●	●	●	●	●	●		
Elapsed				●	●	●	●	●	●	●
Calendar	●	●	●	●	●	●	●	●		
Time Zones									●	●

Money

Identify Coins	●	●	●							
Identify Value	●	●	●	●	●					
Making Change					●	●	●	●	●	●
Value Comparison	●	●	●	●	●	●	●	●		

Number Theory**Number Sense**

Counting	●	●	●	●	●					
Place Value	●	●	●	●	●	●	●	●	●	●
Integers				○	○	○	○	○	○	○
Greater Than/Less Than	●	●	●	●	●	●	●	●	●	●
Even and Odd Numbers			●	●	●	●	●			
Prime and Composite Numbers							●	●	●	●
Prime Factorization								●	●	●
Divisibility					●	●	●	●	●	●
Factors and Greatest Common Factors					●	●	●	●	●	●
Multiples and Least Common Multiples					●	●	●	●	●	●

Ratio and Proportion

Ratios							●	●		
Equal Ratios							●	●	●	●
Rate and Unit Rate								●	●	●

Percent

Related to Ratios							●	●	●	●
Related to Fractions/Decimals							●	●	●	●
Finding a Percent of a Number							●	●	●	●
Find What Percent One Number is of Another							●	●	●	●
Find a Number When a Percent of it is Known									●	●
Interest, Discount, Commission								●	●	●

Numeration

Patterns

	PK	K	1	2	3	4	5	6	7	8
With Objects/Geometric Figures	●	●	●	●	●	●	●			
With Numbers			●	●	●	●	●	●	●	●
Skip Counting			●	●	●	●	●			

Numeration

Meaning of Numbers	●	●	●	●	●					
Reading and Writing Numbers	●	●	●	●	●	●	●	●	●	●
Ordinal Numbers	●	●	●	●	●					
Roman Numerals					●	●	●	●	●	●

Estimation

Using Front-End Digits					●	●	●	●	●	●
Rounding Whole Numbers/Decimals				●	●	●	●	●	●	●
Rounding Fractions/Mixed Numbers						●	●	●	●	●
Compatible Numbers							●	●	●	●
Clustering							●	●	●	●

Technology

Calculator

Whole Number Operations			●	●	●	●	●	●	●	●
Decimals/Money					●	●	●	●	●	●
Fractions						●	●	●	●	●
Percent								●	●	●

Whole Numbers

Addition

Vocabulary of Addition	●	●	●	●	●					
Related to Subtraction			●	●	●					
Fact Families			●	●	●	●				
Basic Facts and Fact Strategies	●	●	●	●	●					
Properties			●	●	●	●	●			
Three or More Addends			●	●	●	●	●			
Adding Two-Digit Numbers			●	●	●					
Regrouping				●	●					
Adding Three-Digit Numbers				●	●	●				
Regrouping				●	●	●				

Whole Numbers/Addition, cont.

	PK	K	1	2	3	4	5	6	7	8
Adding with Four or More Digits					●	●	●			
Regrouping					●	●	●			
Estimation and Mental Math			●	●	●	●	●	●	●	●

Subtraction

Vocabulary of Subtraction	●	●	●	●	●					
Related to Addition			●	●	●					
Basic Facts and Fact Strategies	●	●	●	●	●					
Subtracting Two-Digit Numbers			●	●	●					
Regrouping				●	●					
with Zeros				●	●	●				
Subtracting Three-Digit Numbers				●	●					
Regrouping				●	●	●				
with Zeros				●	●	●				
Subtracting with Four or More Digits					●	●	●	●		
Regrouping						●	●	●		
with Zeros					●	●	●			
Estimation and Mental Math				●	●	●	●	●	●	●

Multiplication

Vocabulary of Multiplication				●	●	●				
Related to Addition/Division				●	●	●				
Basic Facts and Fact Strategies					●	●	●			
Properties					●	●	●	●	●	●
By a One-Digit Number					●	●	●			
By Multiples of Ten or More					●	●	●	●	●	●
By a Multi-Digit Number					●	●	●	●	●	●
Estimation and Mental Math					●	●	●	●	●	●

Division

Vocabulary of Division				●	●	●	●			
Related to Subtraction/Multiplication					●	●	●			
Basic Facts and Fact Strategies					●	●	●			
By a One-Digit Divisor					●	●	●	●	●	
By Multiples of Ten and One Hundred						●	●	●	●	●
By a Multi-Digit Divisor						●	●	●	●	●
Estimation and Mental Math				●	○	●	●	●	●	●

SQUARES, SQUARE ROOTS, CUBES, AND CUBE ROOTS

A square is the product of any number multiplied by itself. Ex: 64 is the square of 8. A square root is a number that when multiplied by itself equals a given number. Ex: the square root of 36 is 6.

Example

5^2 is read "5 squared."
 $\sqrt{25} = 5$ is read "the square root of 25 is 5."

Write the standard numerals.

1. $6^2 =$ _____

2. $8^2 =$ _____

3. $9^2 =$ _____

4. $11^2 =$ _____

5. $5^2 =$ _____

6. $3^2 =$ _____

Write the square roots.

7. $\sqrt{100} =$ _____

8. $\sqrt{4} =$ _____

9. $\sqrt{400} =$ _____

10. $\sqrt{81} =$ _____

11. $\sqrt{1} =$ _____

12. $\sqrt{900} =$ _____

Use a calculator to find each of the following square roots. Press the number, and then the $\sqrt{\quad}$ sign.

13. $\sqrt{8,100} =$ _____

14. $\sqrt{1,225} =$ _____

15. $\sqrt{1,849} =$ _____

16. $\sqrt{5,776} =$ _____

17. $\sqrt{841} =$ _____

18. $\sqrt{2,500} =$ _____

The square roots above are "perfect squares" because their answers are whole numbers. Use a calculator to find the square roots of numbers that are not perfect squares. Find the square roots of the numbers. Round to thousandths.

19. $\sqrt{2} =$ _____

20. $\sqrt{10} =$ _____

21. $\sqrt{6} =$ _____

22. $\sqrt{46} =$ _____

23. $\sqrt{11} =$ _____

24. $\sqrt{30} =$ _____

Find the length of each side.

25. A square has an area of 841cm^2 . What is the length of each side? _____

26. A square has an area of 441cm^2 . What is the length of each side? _____

A cube root is a number that when multiplied three times equals a given number. 3^3 is read three cubed. $\sqrt[3]{27} = 3$ is read "The cube root of 27 equals 3."

27. $6^3 =$ _____

28. $4^3 =$ _____

29. $5^3 =$ _____

30. $3^3 =$ _____

Write the cubes.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Perfect Cubes	1	8													

COMPARE/ORDER

This lesson teaches two ways to compare and order fractions.

Example

Rename the fractions using a common denominator and then compare. This is the best method for ordering fractions.

$$\frac{3}{8} \bigcirc \frac{2}{3}$$

$$\frac{9}{24} (<) \frac{16}{24}$$

You can also cross multiply to compare fractions.

$$\frac{3}{8} \times \frac{2}{3} \quad \frac{2}{3} \times \frac{3}{8}$$

$$9 < 16 \quad \text{So, } \frac{3}{8} (<) \frac{2}{3}$$

Compare using $<$, $>$ or $=$.

1. $\frac{5}{8} \bigcirc \frac{3}{10}$

2. $\frac{13}{14} \bigcirc \frac{27}{28}$

3. $\frac{15}{18} \bigcirc \frac{3}{8}$

4. $\frac{11}{13} \bigcirc \frac{3}{4}$

5. $\frac{15}{17} \bigcirc \frac{7}{8}$

6. $\frac{3}{12} \bigcirc \frac{5}{20}$

7. $\frac{13}{20} \bigcirc \frac{5}{9}$

8. $\frac{3}{7} \bigcirc \frac{24}{56}$

9. $\frac{1}{2} \bigcirc \frac{5}{11}$

Use the first method in the example to put the fractions in order from least to greatest.

10. $\frac{7}{10}, \frac{4}{5}, \frac{1}{2}$

11. $\frac{7}{9}, \frac{4}{18}, \frac{2}{3}$

12. $\frac{7}{9}, \frac{4}{5}, \frac{2}{3}$

13. $\frac{2}{10}, \frac{1}{25}, \frac{4}{50}, \frac{8}{20}$

Apply what you know.

14. Shyanne and Nicholas each get \$10 a week for allowance. Nicholas saves $\frac{2}{5}$ of his allowance every week. Shyanne saves $\frac{3}{8}$ of hers. Who saves the most?

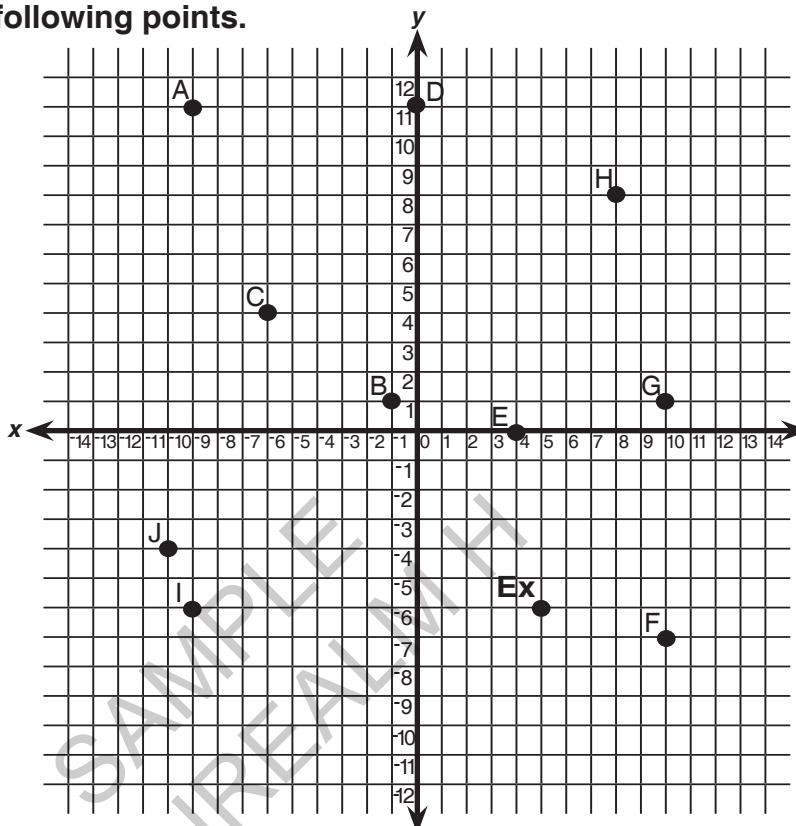
ORDERED PAIRS

An ordered pair is a number pair arranged in order so there is a first number and a second number. The coordinates of a point in a plane are an ordered pair. Ex: (3, 0)

Give the coordinates for the following points.

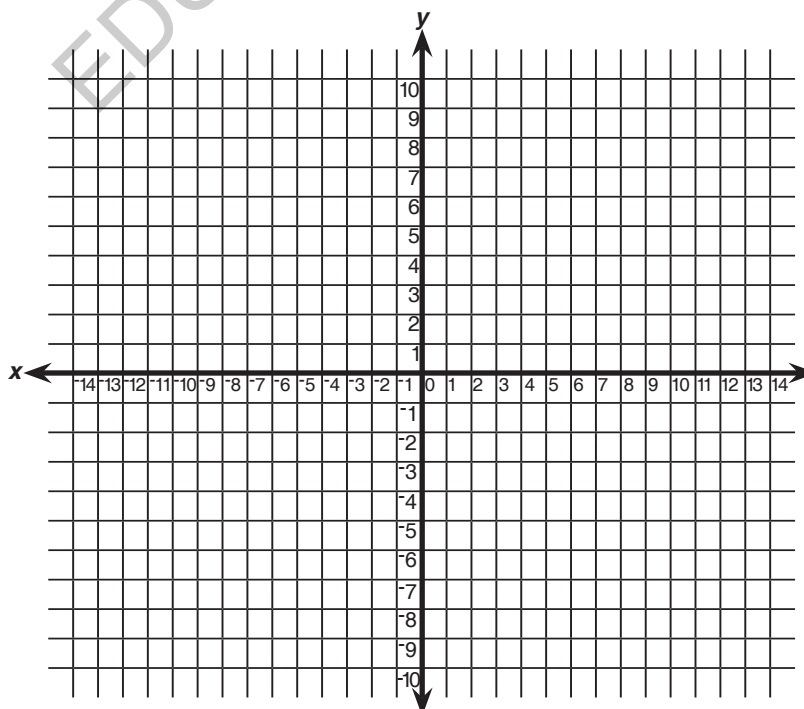
Ex: point Ex (5 , -6)

1. point A (____, ____)
2. point B (____, ____)
3. point C (____, ____)
4. point D (____, ____)
5. point E (____, ____)
6. point F (____, ____)
7. point G (____, ____)
8. point H (____, ____)
9. point I (____, ____)
10. point J (____, ____)



Graph the following points.

11. point A (6, -3)
12. point B (-5, 5)
13. point C (-2, -9)
14. point D (1, -10)
15. point E (4, -7)
16. point F (-1, 3)
17. point G (8, -8)
18. point H (9, 2)
19. point I (-3, 6)
20. point J (0, 0)



CONVERT FROM FAHRENHEIT TO CELSIUS

In this lesson, we will learn about converting Fahrenheit and Celsius. The equations for converting temperatures are as follows:

Fahrenheit to Celsius: $C = \frac{5}{9} (F - 32)$

Celsius to Fahrenheit: $F = \frac{9}{5} C + 32$

Convert the Fahrenheit temperatures to Celsius. Round answers to the nearest degree.

Example

Convert 46°F to Celsius. $C = \frac{5}{9} (F - 32)$

$$C = \frac{5}{9} (14)$$

$$C = \frac{5}{9} \cdot \frac{14}{1} = \frac{70}{9} = 7.77778$$

Rounded to nearest degree. $C = \underline{8^\circ}$

1. 69°F = _____°C

5. -10°F = _____°C

2. 99°F = _____°C

6. 105°F = _____°C

3. 12°F = _____°C

7. 95°F = _____°C

4. 45°F = _____°C

8. -9°F = _____°C

PERCENT

You can use the $\boxed{\%}$ key on the calculator to solve percent problems.

Use a calculator to solve.

Examples

Find 13% of 80.

$$13 \times 80\% = \mathbf{9.75}$$

What % of 60 is 25?

$$25 \div 60\% = \mathbf{41.67}$$

22% of what number is 15?

$$15 \div 22\% = \mathbf{68.18}$$

Use the first example to solve.

1. Find 20% of 100. _____
2. Find 33% of 200. _____
3. Find 50% of 4,208. _____
4. Find 85% of 12,000. _____

Use the second example to solve.

5. What % of \$900 is \$225? _____
6. What % of 250 is 85? _____
7. What % of 7,500 is 1,350? _____
8. What % of \$888 is \$577.20? _____

Use the third example to solve.

9. 45% of what number is 90? _____
10. 75% of what number is 420? _____
11. 15% of what number is 61.80? _____
12. 90% of what number is 765? _____
13. 20% of what number is 35? _____
14. 88% of what number is 88? _____