## Mathematics 9 Learning Guide Package



## Welcome to Mathematics 9

Our goal at Frances Kelsey is to help you become familiar with the material in Mathematics 9.

- Keep in contact with your marking teacher.
- Work with a partner.
- Work on Math in the Math Work Area!


## Steps for Success:

## 1 READ THROUGH

Before each math class be sure to read through the pages listed in the Learning Guide.


During designated math classes be sure to attend and listen to the seminar. Ask Questions

## YOU NEED:

## TEXTBOOK

You can sign out a Textbook
from the Science Kiosk.

## SCIENTIFIC

CALCULATOR


## LG 0 - COURSE OUTLINE

Listed below are the topics of the 18 Learning Guides that are taught.
TOPICS:

- LG 1/2 Word Wall \& Measurement Conversions
- LG 3/4 Powers \& Exponent Laws
- LG 5/6 Rational Numbers
- LG 7/8 Linear Relations
- LG 9/10 Polynomials
- LG 11/12 Linear Equations
- LG 13/14 Similarity \& Triangles
- LG 15 Financial Literacy
- LG 16 Probability \& Statistics
- LG 17 Logic
- LG 18 Math in the Real World


## "Don't worry about the difficulties in mathematics; I can assure you that mine are still greater" A. Einstein

## HOW TO BE SUCCESSFUL:

- Arrive to class prepared and on time.
- Work with a partner.
- Ask for help as soon as you need it. Don't put off to another day!!
- Be an active learner. Participate in discussions and activities.
- Use Work Blocks and homework time to complete assignments.
- Study/review for tests.
- Stay up to date with the course. Mandatory test dates are in effect.

Come for Math Help ~ TBA $\qquad$

> EVALUATION
> - Assignments / Guide Work $20 \%$
> - Tests / Quizzes $80 \%$

Procrastination makes easy things hard, hard things harder. - Mason Cooley

## LG 1 \& 2 - Word Wall \& Linear Measurement Conversions

What will I have to do for LG 1?

1. Introduction

Logic
Word Wall
Listen: To seminar!Do Word Wall Activity (see hand out)


What will I have to do for LG 2?

## 2. Linear Measurement

Listen: Seminar
Discuss \& Practice:

|  | Do WORKSHEET \#1 - Linear Measurement: <br> Metric and Imperial |
| :--- | :--- |
|  | Do WORKSHEET \#2 - Linear Measurement <br> and Metric Conversions |
| Do WORKSHEET \#3 - Converting Between <br> Metric Units |  |
|  | Do WORKSHEET \#4 - Math for Trades |
|  | Find a partner and complete the "Linear <br> Measurement Lab" |

## In Class Activity

Do: Linear Measurement Lab


## LG 3 \& 4 - Powers \& Exponent Laws

What am I going to learn in LG 3?

### 2.1. What is a Rower?

Identify the base of each power, then evaluate.
i) $5^{3}$
ii) $(-11)^{2}$
iii) $-2^{5}$

Write as a power.
i) $6 \times 6 \times 6 \times 6$
ii) 8
iii) $-2 \mathrm{X}-2 \mathrm{X}-2$

Write as a repeated multiplication and in standard form.
i) $9^{3}$
ii) $(-3)^{4}$
iii) $-4^{5}$

### 2.2. Fowers of Ten and the Zero Exponent.

Evaluate each expression.
i) $7^{0}$
ii) - $^{0}$

Write 4325 using powers of 10 . (hint: place value chart)
2. Order of Operations with Powers
i) $4^{2}+3^{3}$
ii) $(4-5)^{2}$
iii) $2(3+4)^{2}-5^{2}$


What will I have to do for LG 3?

### 2.1 What is a Power?

Read: P. 52-55Do: P. $55 \quad 4-9,11,12$
P. 56 13, 14, 16-19
P. 57 20, 21
[d Be sure to always check all your answers with the answers at the back of Textbook.

### 2.2 Powers of Ten and Zero Exponents

Read: P. 58-61
$\square$ Do: P. 61 4, 5, 6
P. $617-10,12,13$
P. $62 \quad 15$


### 2.3 Orders of Operations with Powers

Read: P. 63-65
Do: P. 66 6-11
P. 67 14-18
P. 68 20-22
P. 68 24ab, 27ab

## Mid-Unit Review

$$
\text { Do: P. } 69 \quad 1-6 \& 8-10
$$

Do the LG 3 quiz found in your "Quiz
Package" and see your teacher to get it marked.

## "Be sure to keep all of your Quizzes for further review."

What am I going to learn in LG 4?

## 24. Brnoment Laws 1

Write each expression as a power.
i) $7^{4} \times 7^{2}$
ii) $(-3)^{3} \times(-3)^{5}$
iii) $6^{9} \div 6^{4}$

Evaluate each.
i) $2^{3} \times 2^{2}$
ii) $(-5)^{6} \div(-5)^{4}$

Evaluate.
$2^{4} \times 2-2^{5} \div 2^{4}$

## 25 Thard

Write each as a power.
i) $\left(5^{3}\right)^{2}$
ii) $\left[(-8)^{4}\right]^{3}$
iii) $-\left(2^{7}\right)^{3}$

Simplify, then evaluate each.
i) $\left(\frac{42}{7}\right)^{2}$
ii) $\left(2^{3} \times 2\right)^{2}-\left(3^{7} \div 3^{5}\right)^{3}$

What will I have to do for LG 4?

### 2.4 Exponent Laws I

Read: P. 73-76
Do: P. 76 4,5
P. $776-11,13,15,17$
P. $78 \quad 21$

### 2.5 Exponent Laws II

Read: P. 79-83Do: P. 84 3abc, 4-8
P. $849-12,14-16,19$
P. $85 \quad 21$

## Laws of Exponents

$$
\begin{aligned}
& a^{1}=a \\
& a^{0}=1 \\
& a^{-n}=\frac{1}{a^{n}} \\
& \left(a^{m}\right)^{n}=a^{m n}
\end{aligned}
$$

## Review

Do: P. 89 18-22 \& 23-27

## If you want more Review

> Do pg. 90 "Practice Test"
Go Over Formative Quiz from LG 3
See your teacher to do the
LG 3/4 Summative Test

[^0]
## LG 5 \& 6 - Rational Numbers

What am I going to learn in LG 5?

## 31. What is a Rational Number

Order the following rational numbers from least to greatest. Show them on a number line.

$$
3.12,-\frac{4}{3}, \quad 0.9,-\frac{1}{2},-0.4
$$



Write 3 rational numbers between each pair of numbers.
i) $-3.5,-3.1$
ii) $\frac{1}{5}, \frac{7}{10}$
iii) $-\frac{5}{2},-\frac{3}{2}$

## 『39

Determine each sum.
i) $-1.2+(-0.4)$
ii) $123.45+(-87.39)$
iii) $\frac{3}{4}+\frac{7}{8}$
iv) $-4 \frac{5}{6}+\left(-1 \frac{5}{12}\right)$

A January morning temperature was $-6.4^{\circ} \mathrm{C}$. The temperature dropped $2.1^{\circ} \mathrm{C}$ by the end of the day. What was the temperature at the end of the day?

## 33 Subtracting Rathonal Numbers

Determine each difference.
i) 4.7-12.3
ii) $-2.7-(-11.5)$
iii) $-3 \frac{2}{3}-\frac{1}{4}$
iv) $\frac{12}{7}-\left(-\frac{4}{5}\right)$

What will I have to do for LG 5?

### 3.1 What is a Rational Number?

Read: P. 94-100
Do: P. 101 5-11
P. 102 13, 14ace, $15-19$
P. 103 22, 24
P. 103 26, 27

Be sure to always check all your answers with the answers at the back of Textbook.

### 3.2 Adding Rational Numbers

Read: P. 106-110
Do: P. 111 3-7
P. 112 11, 13, 15, 18, 19
P. 11320

### 3.3 Subtracting Rational Numbers

Read: P. 114-118Do: P. 119 3-5
P. 119 6-9
P. 120 11-16

## Mid-Unit Review

Do: P. 121 1-10
Do the LG 5 quiz found in your "Quiz Package" and see your teacher to get it marked.

## "Be sure to keep all of your Quizzes for further review."

What am I going to learn in LG 6?

| 34 Mutiming Rationa Nombers |
| :---: |
| Determine each product. <br> i) $3.6 \times(-0.8)$ <br> ii) $(-4.2)(-2.7)$ |
| iii) $\left(-\frac{2}{5}\right)\left(\frac{3}{4}\right) \quad$ iv) $2 \frac{1}{3} \times\left(-4 \frac{1}{2}\right)$ |
|  |
| Determine each quotient. |
| i) $3.6 \div(-0.8) \quad$ ii) $(-4.2) \div(-2.7)$ |
| iii) $\left(-\frac{2}{5}\right) \div\left(\frac{3}{4}\right) \quad$ iv) $2 \frac{1}{3} \div\left(-4 \frac{1}{2}\right)$ |
| 36, Order of Operations with ratonal Numbers |
| Evaluate each expression. |
| i) $-1.3 \div(0.5)-[7.5+(-3.9)]$ |
| ii) $\left(-\frac{2}{5}\right)\left(\frac{1}{4}\right)-\left(-\frac{3}{7}\right) \div \frac{1}{3}$ |



What will I have to do for LG 6?

### 3.4 Multiplying Rational Number?

Read: P. 123-127
$\square$ Do: P. 127 3-7
P. 128 8-12, 15
P. 12916
3.5 Dividing Rational Number?

Read: P. 130-134
Do: P. 134 3-5
P. 135 6-9
P. 136 16-18, 21

### 3.6 Order of Operation with Rational Number?

Read: P. 137-139
Do: P. 140 3, 4-8
P. $141 \quad 10-13$
P. 142 19, 21

## Review

Do: P. 144 11, 12
P. $14514,16,18,19,21,23$

If you want more Review
> Do pg. 146 "Practice Test"
Go Over Formative Quiz from LG 5

See your teacher to do the
LG 5/6 Summative Test

Rational Numbers: $Q=\left\{\left.\frac{a}{b} \right\rvert\, a, b \in I, b \neq 0\right\}$

## LG 7 \& 8 - Linear Relations

## What am I going to learn in LG 7?

## 4月 Worthor

Determine an equation that relates the number of circles, $C$, to the figure number, $n$.


Figure 3


Figure 4

The pattern in this table continues. Write an equation that relates the number of squares to the figure number.

| Figure <br> Number, $\boldsymbol{f}$ | 1 | 2 | 3 | 4 | 5 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Number of <br> Squares, $\boldsymbol{s}$ | 46 | 42 | 38 | 34 | 30 |

## 

a) Create a table of values for the linear relation $y=\frac{1}{2} x-1$. Use $-4,-2,0,2,4$ for values of $x$.

| $\boldsymbol{x}$ | -4 | -2 | $\mathbf{0}$ | 2 | 4 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $\boldsymbol{y}$ |  |  |  |  |  |

## 

Which equation describes a horizontal line?
i) $x+9=2$
ii) $y+x=3$
iii) $y-x=0$
iv) $y+2=9$

What will I have to do for LG 7?

### 4.1 Writing Equations to Describe Patterns

Read: P. 154-1158
Do: P. 159 4-9
P. 160 11, 12, 14, 16, 17
P. 162 19, 20
[d Be sure to always check all your answers with the answers at the back of Textbook.

### 4.2 Linear Equations

Read: P. 164-169
Do: P. $170 \quad 4-10$
P. 172 12, 13
P. 17318

### 4.3 Subtracting Rational Numbers

Read: P. 174-177Do: P. 178 4-11
P. $18015,18,21$

## Mid-Unit Review

Do: P. 181 1-7
$\square$ Do the LG 7 quiz found in your "Quiz Package" and see your teacher to get it marked.

## "Be sure to keep all of your Quizzes for further review."

## What am I going to learn in LG 8?

### 44.4 Natchting Fquations and Craphs

Match each equation with a graph on the grid below.
i) $y=-0.25 x$
ii) $y=4 x$
iii) $y=-4 x$
iv) $y=0.25 x$


4CP Graphing Dinear Tunctions

1. Plotting points and their quadrants. $(3,-1)$

2. Finding slope by a graph.

3. Finding slope by two points $(2,5) \&(-4,0)$
4. Creating a table of values to graph $2 x-3 y=6$.
5. Using the 0-0 Table to find intercepts: $x+2 y=4$.

Graph \#4 below


Graph \#5 below


What will I have to do for LG 8?

### 4.4 Matching Equations and Graphs?

Read: P. 183-187Do: P. $188 \quad 3-9,12$
P. $190 \quad 13$

4.GP

Graphing Package
See your teacher to receive Graphing Package
Be Bure to check all your answers with the answers at the back of Package.

## Review

Do: P. 202 11-13

If you want more Review
$>$ Do pg. 204 "Practice Test"
$>$ Be sure to look over your "Graphing Package" before test as well.

Go Over Formative Quiz from LG 7
$\square$ See your teacher to do the
LG 7/8 Summative Test


## LG 9 \& 10 - Polynomials

## What am I going to learn in LG 9?

## 

a) Match each polynomial with its
corresponding algebra tile model.
b) Which polynomials are monomial, binomial or trinomial?


Combine like terms. Sketch algebra tiles if it helps.
a) $2 m-4+3 m+m^{2}+6$
b) $3 x^{2}+x-x-4+3 x^{2}$

53 (1)
Add.
a) $(5 x+2)+(x-2)$
b) $\left(3 n^{2}-n-2\right)+\left(-2 n^{2}+4 n-1\right)$

Subtract.
a) $(2 x-4)-(x+7)$
b) $\left(y^{2}+2 y-5\right)-\left(2 y^{2}-y+8\right)$

What will I have to do for LG 9?

### 5.1 Modelling Polynomials

Read: P. 210-213
Do: P. 214 4-9, 11, 12, 13
P. 216 19, 20

Be sure to always check all your answers with the answers at the back of Textbook.

### 5.2 Like Terms \& Unlike Terms

Read: P. 217-221
Do: P. 222 4-8,
P. 223 12-14ace, 22
$6 b+4 c-2 b+7 c$
$=4 b+11 c$

### 5.3 Adding Polynomials

Read: P. 226-228
Do: P. 228 3, 5-7
P. 229 8, 9ace, 10, 11ace
P. 230 15ace, 17ac

### 5.4 Subtracting Polynomials

Read: P. 232-234Do: P. 235 8, 13, 15, 16, 17

## Mid-Unit Review

Do: P. 237 1-12
Do the LG 9 quiz found in your "Quiz Package" and see your teacher to get it marked.

## "Be sure to keep all of your Quizzes for further review."

What am I going to learn in LG 10?

## 58 kill

Multiply or Divide.
a) $4(2 s-1)$
b) $-2\left(3 x^{2}-7 x+1\right)$
c) $\frac{18 m-12}{3}$
d) $\frac{20 x^{2}+24 x-4}{4}$

Write the multiplication sentence modelled by this set of algebra tiles. Determine the product.

54 Mid

Determine each quotient.
a) $4 s(2 s-1)$
b) $-2 x\left(3 x^{2}-7 x+1\right)$
c) $\frac{18 m-12}{3 m}$
d) $\frac{20 x^{2}+24 x-4}{4 x}$

What will I have to do for LG 10?
5.5 Multiplying \& Dividing a Polynomial by a Constant

Read: P. 241-245
Do: P. 246 5, 6, 7a, 8a,
P. 247 9, 10, 12, $14-16$
P. 248 22-24

### 5.6 Multiplying \& Dividing a Polynomial

 by a MonomialRead: P. 249-254Do: P. 255 9a, 10a
P. 256 11, 12, 14
P. 257 20, 21, 22, 23

## Review

Do: P. 261 22, 23, 26-28
If you want more Review
> Do pg. 262 "Practice Test"
Go Over Formative Quiz from LG 9
See your teacher to do the

## LG 9/10 Summative Test

## LG 11 \& 12 - Linear Equations

What am I going to learn in LG 11?

## 61 Solving Equations by Using Iaverse

## Operations

For each statement below, write then solve an equation to determine each number.
a) Four times a number is -1.2
b) A number divided by 5 is 2.5

Solve then verify each equation.
a) $2.2 m-1.6=-16.4$
b) $\frac{w}{4}+5=1.2$
c) $10.4=2(2.5+x)$

## 

Solve each equation.
a) $-10 a=15-5 a$
b) $3-2 x=3 x+13$
c) $3.4=\frac{6.8}{r}$

Two Bus Companies are considered for a Hockey road trip.

Bus Co. X costs $\$ 40$ per person.
Bus Co. Y costs $\$ 500$, plus $\$ 30$ per person.
Determine the number of people for which the bus will cost the same to take this road trip.
a) Model this problem with an equation.
b) Solve the problem.
c) Verify the solution.


## What will I have to do for LG 11?

### 6.1 Solving Equations by Using Inverse Operations

Read: P. 266-271
Do: P. 271 5, 8ace, 9-11
P. 273 16, 18ace
P. 274 20, 21, 24
(1) Be sure to always check all your answers with the answers at the back of Textbook.

### 6.2 Solving Equations by Using Balance Strategies

Read: P. 276-280
Do: P. 281 8, 9, 10ace, 11ace, 12, 13
P. 282 17, 19
P. 283 21-23

Two Methods to Solve Linear Equations


Mid-Unit Review
Do: P. $2861-8$
Do the LG 11 quiz found in your "Quiz Package" and see your teacher to get it marked.
"Be sure to keep all of your Quizzes for
further review."

What am I going to learn in LG 12?

## 

1. What will be the cost to heat your house if the Temp. was set at $21^{0} \mathrm{C}$.


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1. Plot data on a Grid and then draw a "Best Fit Line" so you can examine the data to answer questions.

NHL Hockey Ticket Prices

| Year | 2000 | 2004 | 2008 | 2012 | 2016 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Avg. Price | 45 | 58 | 63 | 71 | 88 |

a) Cost in 2010
b) Cost in 2020


## 

2. What will be the cost to heat your house if the Temp. was set at $29^{\circ} \mathrm{C}$.


What will I have to do for LG 12?

### 4.5 Using Graphs to Estimate Values

Read: P. 191-195
Do: P. 196 4-7
P. 197 8, 9, 13
P. 19815

## W.S. Statistics: Scatter Plots \& Line of Best Fit

Listen: To seminar!
Do: Worksheet \#1
Scatter Plots \& Correlations

## Strong vs. Weak Correlation



Do: Worksheet \#2
Line of Best Fit

Do: Worksheet \#3
Combination of Scatter Plots, Correlations \& Line of Best Fit

## Review

$\square$ Do: P. 203 14-17

If you want more Review
> Do pg. 204 "Practice Test" \#5 only
Go Over Formative Quiz from LG 11
See your teacher to do the LG 11/12 Summative Test

## LG 13 \& 14 - Similarity \& Triangles

What am I going to learn in LG 13?

## 71. Scale Diagrams \& Dnlargoments

1. Determine the scale factor for this scale drawing.

2. An enlargement of the shape below is made using a scale factor of 2 .
Determine the side lengths of the enlargement.

1.2 Scale Diagrams \& Reductions
3. Determine the scale factor for this scale drawing.

4. A circle has diameter 20 cm . The diameter of the reduction is 5 cm .
Determine the scale factor.


What will I have to do for LG 13?

### 7.1 Scale Diagrams \& Enlargement

Read: P. 319-322Do: P. 323 4-8
P. 324 12, 14

De sure to always check all your answers with the answers at the back of Textbook.

### 7.2 Scale Diagrams \& Reductions

Read: P. 326-328
Do: P. 329 4-9
P. 330 11, 14


Mid-Unit Review
Do: P. 352 1-4

Do the LG 13 quiz found in your "Quiz Package" and see your teacher to get it marked.

## "Be sure to keep all of your Quizzes for further review."

What am I going to learn in LG 14?


### 7.3 Similar Polygons

Read: P. 335-340Do: P. 341 4-10
P. 342 11, 13

### 7.4 Similar Triangles

Read: P. 344-348
Do: P. 349 4-6
P. 350 7, 9, 11
P. 351 12, 13, 15


## Review

$$
\text { Do: P. } 352 \quad 5-7
$$

## If you want more Review

> Do pg. 380 "Practice Test" \#1 \& 2
Go Over Formative Quiz from LG 13
See your teacher to do the LG 13/14 Summative Test


## LG 15 - Financial Literacy

## LG 16 - Probability \& Statistics

What am I going to learn in LG 15?


What will I have to do for LG 15?

## Finances and Budgeting Assigmment

See your teacher to receive Assignment

Be sure to answer all questions thoroughly. When you have completed the assignment hand in to your teacher.

NO Summative Test

What will I have to do for LG $16 ?$
9.1 Probability in Society

Read: P. 425-427
Do: P. 427 3-6
P. 428 8, 9, 11
P. 42914
9.2 Potential Problems with Collecting Data

Read: P. 432-434
$\square$ Do: P. 435 3-8
P. 436 10, 15
9.3 Use Samples \& Populations to

Collect Data
Read: P. 438-440
$\square$ Do: P. 440 3-6

9.4 Selecting a Sample

Read: P. $446-447$
$\square$ Do: P. 448 3-6
P. $449 \quad 12$

See your teacher for the Math Lab on Probability. When you are done hand in the lab and the book work to your teacher.

NO Summative Test

LG 17 - Logic \& Reasoning

## LG 18 - Math Around Us

What will I have to do for LG 17?
Logic \& Reasoning


What will I have to do for LG $18 ?$
A. Math Journal - record where you might see math used in each Learning Guide Topic.
B. Math Project - see below for outline.

Math in the Real World is where you choose a topic and then find a connection to the real world. Display your work by:

- Make a booklet or poster,
- Produce a video on IPad via I-Movie Trailer,
- Do an oral presentation, or by Morpho on IPad
- Power Point Presentation



## Cross Curricular Project

This is an Inquiry Project that you will incorporate core competencies involving math, english, science and social studies.

NO Summative Test

NO Summative Test

## LEARNING GUIDE PACKAGE

## LEARNING GUIDES

1-18


MATHEMATICS 9


FRANCES KELSEY SCHOOL


REVISED - JUNE 2020


[^0]:    $2 \times 2=2^{2}=4$
    $2 \times 2 \times 2=2^{3}=8$
    $2 \times 2 \times 2 \times 2=2^{4}=16$
    $2 \times 2 \times 2 \times 2 \times 2=2^{5}=32$
    $2 \times 2 \times 2 \times 2 \times 2 \times 2=2^{6}=64$
    $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2=2^{7}=128$

