The following resources and links are intended to provide an insight and practice into the recently developed new Algebra 1 curriculum that is aligned to PDE's Standards Aligned System. The skill sets found within these links/resources should be of significant help in a student's preparation for the new Algebra 1 curriculum.

ALGEBRA I PRE-COURSE SKILLS

The following is a list of concepts that are necessary for success in the newly designed Keystone/SAS Algebra I course**. Due to the anticipated academic pace of this new curriculum, mastery of these Pre-Algebra concepts is of vital importance before entering Algebra I.** These concepts will not be taught in Algebra I, but only reviewed. Calculators should NOT be used with problems of this type.

1. **Integer Operations**
2. **Integer Operations with more than two numbers; Rational Operations; Order of Operations**
3. **Sets of Real Numbers, Opposites, Absolute Value, Order**
4. **Properties of Real Numbers**
5. **Evaluate Algebraic Expressions**
6. **Identify and Combine Like Terms**
7. **Solve One-Step Equations Using Algebraic Steps and Showing Work**
8. **Solve Two-Step Equations Using Algebraic Steps and Showing Work**
9. **Graphing Ordered Pairs on a 4-Quadrant Coordinate Plane and Associated Vocabulary**
10. **LCM and GCF with Numbers and Variables**
11. **Scientific Notation**

The following pages contain hand-outs that can be used for teaching these topics to the level of mastery necessary. Also included are instructional videos, practice worksheets, and online practice and/or games that may be used to enhance student success.

The links provided on the following pages were operational as of May, 2011.

Lesson #1 - Integer Operations (2 numbers at a time)

Sample Questions

a. –8 + (–3)
b. 3 – (–2)
c. –6 (– 4)
d. 30 ÷ (–5)

ANSWERS a.) – 11
b.) 5
c.) 24
d.) –6

Concept: Binary Integer Operations, Holt Algebra I Text – pages18-21

Instructional Website:

Start with addition and work through all of the operations

http://www.mathgoodies.com/lessons/vol5/addition.html

http://www.math.com/school/subject1/lessons/S1U1L11GL.html

Worksheet/Instructions:

http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP02/1Alg.2SECT2/1Alg.C2.S2.RETEACH.pdf

http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP02/1Alg.2SECT3/1Alg.C2.S3.RETEACH.pdf

http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP02/1Alg.2SECT4/1Alg.C2.S4.RETEACH.pdf

Practice:

Parkland -
http://psdweb.parklandsd.org/msmath/PDF/PreAlgebra/7chap02/less01/7.2.L.1homework.pdf

Online

Addition only – single digits –

http://www.xpmath.com/forums/arcade.php?do=play&gameid=45

Addition only - double digits –

http://www.xpmath.com/forums/arcade.php?do=play&gameid=19

Online Games:

All Operations – Jeopardy –

http://www.math-play.com/Integers-Jeopardy/Integers-Jeopardy.html

Adding and Subtracting on a Number Line – Integer Football

http://www.mathgoodies.com/games/integer_game/football.html

Adding and Subtracting - Walk the Plank! Be sure to have the sound on.

http://www.math-play.com/integers-game.html

Lesson #2 - Integer Operations with more than two numbers; Rational Operations; Order of Operations

Sample Questions:

a. $-\frac{2}{3}-\frac{3}{4}$

b. – 2.5 ÷ 0.125

c. 6 – 8 + (–3) – (–2)

d. (–3) (–5) (–1) (–2)

e. 6 – 5 (–2+5)²

ANSWERS: a.) $-1\frac{5}{12}$

b.) –20
c.) –3
d.) 30
e.) –39

Concept: Order of Operations – Holt Algebra I text – pages 18-22

Instructional Website:
Order of Operations -

Worksheet/Instructions:

Rational Numbers: Same as for Lesson #1

Order of Operations:
http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP01/1Alg.1SECT3/1Alg.C1.S3.STUDY.pdf

Practice:

Parkland -
http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP01/1Alg.1SECT3/1Alg.C1.S3.MASTERSC.pdf

Online

Online Games:

http://www.learnalberta.ca/content/mejhm/index.html?ID1=AB.MATH.JR.NUMB&ID2=AB.MATH.JR.NUMB.INTE&lesson=html/object_interactives/order_of_operations/use_it.html

Lesson #3 - Sets of Real Numbers, Opposites, Absolute Value, Order

Sample Questions:

a. List all of the sets of real numbers to which each number belongs

1.) 2.) 3.) 4.) 5.) 6.) 7.) 8.)

$-2.5,\ \sqrt{13}\ ,\ 0,\ -27,\ 4.\overline{3}\ ,\ 8,\ \sqrt{49}\ ,\ \pi$

b. Name the opposite of –3

c. Find $|-5+3|$

d. List the numbers in (a) above from least to greatest

ANSWERS:

a.) 1.) Rational Numbers, Real Numbers
2.) Irrational Numbers, Real Numbers
3.) Whole Numbers, Integers, Rational Numbers, Real Numbers
4.) Integers, Rational Numbers, Real Numbers
5.) Rational Numbers, Real Numbers
6.) Natural Numbers, Whole Numbers, Integers, Rational Numbers, Real Numbers
7.) Natural Numbers, Whole Numbers, Integers, Rational Numbers, Real Numbers
8.) Irrational Numbers, Real Numbers

b.) 3

c.) 2

d.) $-27,\ -2.5,\ 0\ ,\ \pi,\ \sqrt{13},\ 4.\overline{3},\ \sqrt{49}\ ,\ 8$

Concepts: Sets of Real Numbers, Opposites, Absolute Value, Order
Algebra I Text – Pages 54-57

Instructional Website:
Play this video – Excellent! - http://www.mathvids.com/lesson/mathhelp/1225-classifying-real-numbers

http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP02/1Alg.2SECT1/1Alg.C2.S1.STUDY.pdf

Worksheet/Instructions:
http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP02/1Alg.2SECT4/1Alg.C2.S4.MASTERSC.pdf

Practice:
Parkland -
http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP02/1Alg.2SECT1/1Alg.C2.S1.PRACTICE.pdf

Online Games:
Number System Munchers -
http://staff.argyll.epsb.ca/jreed/math9/strand1/1101.htm

Number Balls – Ordering Integers - http://www.coolmath-games.com/0-numberballs/index.html

Lesson #4 - Properties of Real Numbers

Sample Questions: Identify the property of real numbers illustrated by each of the following:

a. 3 + (7 + 2) = (3 + 7) + 2

b. 5 (2 + x) = 5·2 + 5x

c. 17 + 0 = 17

d. $\left(-\frac{1}{5}\right)(-5)=1$

ANSWERS:

a.) Associative Property of Addition

b.) Distributive Property

c.) Identity Property of Addition

d.) Inverse Property of Multiplication

Concept:

Instructional Website:
http://www.regentsprep.org/Regents/math/ALGEBRA/AN1/properties.htm and
http://www.regentsprep.org/Regents/math/ALGEBRA/AN1/propT2.htm

Worksheet/Instructions: Worksheet on next page

Practice:

Parkland -

Online – http://regentsprep.org/Regents/math/ALGEBRA/AN1/propPrac.htm

http://regentsprep.org/Regents/math/ALGEBRA/AN1/PropPracTami.htm

Online Games:

Properties of Real Numbers

Identify each of the properties of real numbers illustrated in each example. Use the full name of the property as indicated in the example.

Addition	Multiplication
Commutative For all real a, b $a + b = b + a$	**Commutative** For all real a, b $ab = ba$
Associative For all real a, b, c $a + (b + c) = (a + b) + c$	**Associative** For all real a, b, c $(ab)c = a(bc)$
Identity There exists a real number 0 such that for every real a $a + 0 = a$	**Identity** There exists a real number 1 such that for every real a $a \times 1 = a$
Additive Inverse (Opposite) For every real number a there exist a real number, denoted $(-a)$, such that $a + (-a) = 0$	**Multiplicative Inverse (Reciprocal)** For every real number a except 0 there exist a real number, denoted $\frac{1}{a}$, such that $a \times \frac{1}{a} = 1$
Distributive Law For all real a, b, c $a(b + c) = ab + ac$, and $(a + b)c = ac + bc$	

1. (4x + 5y) + z = 4x + (5y + z)
2. 7x + -7x = 0
3. 3(x + y) = 3x + 3y
4. 8m + 4n = 4n + 8M
5. 4v · n = n · 4v
6. 17gh + 0 = 17gh
7. (5y)n = 5(yn)
8. 1(9cd) = 9cd
9. (2x+7)n = (2xn) + (7n)
10. $6 \cdot \frac{1}{6} = 1$

Lesson #5 - Evaluate Algebraic Expressions

Sample Questions:
a. Evaluate $2x - 3$ for $x = -4$
b. Evaluate $-3(2n - 3m)$ for $n = -5$ and $m = 2$

ANSWERS:
a.) -11
b.) 48

Concept:

Instructional Website:
http://teachers.henrico.k12.va.us/math/ms/C30708/02Computation/2-3EvalAlgExpress.html

http://math.com/school/subject2/lessons/S2U2L3EX.html

Worksheet/Instructions:
http://www.kutasoftware.com/FreeWorksheets/Alg1Worksheets/Evaluating%20Expressions.pdf

Practice:
Parkland –

Online –
http://www.math123xyz.com/Nav/Algebra/Express_Practice.php

Online Games:

Lesson #6 - Identify and Combine Like Terms

Sample Questions:

a. $2x - 5y + x - 3y =$
b. $4m - m + 3(n + m) =$

ANSWERS:

a.) $3x - 8y$
b.) $6m + 2n$

Concept:

Instructional Website:

http://www.mathvids.com/lesson/mathhelp/654-combining-like-terms

Worksheet/Instructions:

http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP02/1Alg.2SECT6/1Alg.C2.S6.RETEACH.pdf

Practice:

Parkland – Worksheet on next page

Online

Online Games:

Calculation Nation – "Ker-Splash" (You must join the site first)
http://calculationnation.nctm.org/Games/

COMBINING LIKE TERMS

Simplify each of the following by combining like terms.

1) $-6k + 7k$

2) $12r - 8 - 12$

3) $n - 10 + 9n - 3$

4) $-4x - 10x$

5) $-r - 10r$

6) $-2x + 11 + 6x$

7) $11r - 12r$

8) $-v + 12v$

9) $-8x - 11x$

10) $4p + 2p$

11) $5n + 11n$

12) $n + 4 - 9 - 5n$

13) $12r + 5 + 3r - 5$

14) $-5 + 9n + 6$

15) $n - 4 - 9$

16) $4n - n$

17) $-3x - 9 + 15x$

18) $-9k + 8k$

19) $-16n - 14n$

20) $15n - 19n$

21) $-4 + 7(1 - 3m)$

22) $-5n + 3(6 + 7n)$

23) $-2n - (9 - 10n)$

24) $10 - 5(9n - 9)$

25) $9a + 10(6a - 1)$

26) $-9(6m - 3) + 6(1 + 4m)$

27) $-10(1 - 9x) + 6(x - 10)$

28) $5(-2n + 4) + 2(n + 3)$

29) $-3(10b + 10) + 5(b + 2)$

30) $-7(n + 3) - 8(1 + 8n)$

Lesson #7 - Solve One-Step Equations Using Algebraic Steps and Showing Work

Sample Questions:

a. –3x = – 18
b. y – 7 = –5

ANSWERS:
a.) x = 6
b.) y = 2

Concept: Holt Algebra I – pages 114-127

Instructional Website:

Video - http://www.brightstorm.com/math/algebra/solving-equations/solving-single-step-equations

Worksheet/Instructions:

http://psdweb.parklandsd.org/msmath/PDF/PreAlgebra/7chap03/less06/7.3.L.6reteach.pdf

Practice:

Parkland -
http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP03/1Alg.3SECT1/1Alg.C3.S1.PRACTICE.pdf

http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP03/1Alg.3SECT2/1Alg.C3.S2.PRACTICE.pdf

Online

Online Games:

http://www.math-play.com/One-Step-Equation-Game.html

Lesson #8 - Solve Two-Step Equations Using Algebraic Steps and Showing Work

Sample Questions:

a. 2x – 3 = 15

b. – 5x – 3 = 12

ANSWERS:

a.) x = 9

b.) x = –3

Concept: Holt Algebra I – pp. 129 -133

Instructional Website:

http://www.lexington1.net/technology/instruct/lessons/hsa/equations.ppt

Worksheet/Instructions:

http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP03/1Alg.3SECT3/1Alg.C3.S3.RETEACH.pdf

Practice:

Parkland -
http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP03/1Alg.3SECT3/1Alg.C3.S3.PRACTICE.pdf

Online
http://www.onlinemathlearning.com/2-step-equations.html

Online Games:

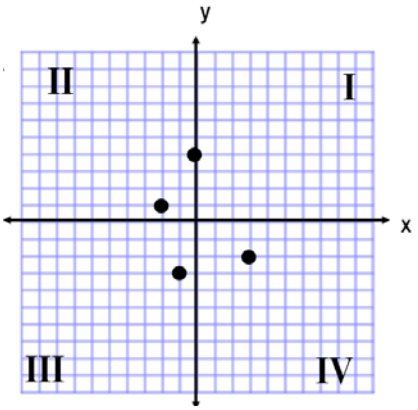
http://www.math-play.com/Two-Step-Equations-Game.html

Lesson #9 - Graphing Ordered Pairs on a 4-Quadrant Coordinate Plane and Associated Vocabulary

Sample Questions

a. Construct an x-y coordinate axis
b. Label the quadrants and axes
c. Graph the points (0,4), (–2, 1), (3, –2), (–1, –3)

ANSWERS:



Concept: Coordinate Graphing

Holt Algebra I – p. 24 and 25

Instructional Website:
http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP01/1Alg.1SECT4/1Alg.C1.S4.RETEACH.pdf

http://www.mathsisfun.com/data/cartesian-coordinates.html - Do not do 3-dimensional graphing

Worksheet/Instructions:

Practice:
Parkland -
http://psdweb.parklandsd.org/msmath/PDF/Algebra%201/CHAP01/1Alg.1SECT4/1Alg.C1.S4.MASTERSA.pdf

Online –

Online Games:

Graph Mole – Start with Easy; progress through Hard
http://funbasedlearning.com/algebra/graphing/points/

Lesson #10 - LCM and GCF of Numbers and Variables

Sample Questions:

a. Find the LCM of 12 and 20

b. Find the GCF of $6xy$ and $8x^2$

ANSWERS:

a.) 60

b.) 2x

Concept: Holt Pre-Algebra – page 764 – Focus on Prime Factorization

Instructional Website:

Worksheet/Instructions:

http://psdweb.parklandsd.org/msmath/PDF/6%20Math%20PDF/Chap.%204/4.3reteach.pdf

http://psdweb.parklandsd.org/msmath/PDF/6%20Math%20PDF/Chap.%205/5.5reteach.pdf

Practice:

Parkland - http://psdweb.parklandsd.org/msmath/PDF/6%20Math%20PDF/Chap.%204/4.3practicec.pdf

http://psdweb.parklandsd.org/msmath/PDF/6%20Math%20PDF/Chap.%205/5.5practicec.pdf

Online – IMPORTANT! First page only http://www.glencoe.com/sites/mississippi/support_teacher/state_resources/pdf/al_mac_course3.pdf

Puzzles: http://www.auburnschools.org/drake/bmconway/files/worksheets/GCF001.pdf

Online Games:

Lesson #11 - Scientific Notation

Sample Questions:

a. Write 5,230,000,000 in scientific notation
b. Write 2.7×10^{-5} in standard form

ANSWERS:

a.) 5.23×10^{9}
b.) 0.000027

Concept: Scientific Notation

Instructional Website:
http://psdweb.parklandsd.org/msmath/PDF/PreAlgebra/7chap02/less09/7.2.L.9reteach.pdf

Worksheet/Instructions:
Videos –
http://www.mathvids.com/lesson/mathhelp/477-scientific-notation-part-i (eliminate fractions)
http://www.mathvids.com/lesson/mathhelp/477-scientific-notation-part-i

Practice:
Parkland -
http://psdweb.parklandsd.org/msmath/PDF/PreAlgebra/7chap02/less09/7.2.L.9practicec.pdf

Online –

Online Games:
http://www.xpmath.com/forums/arcade.php?do=play&gameid=21
http://www.xpmath.com/forums/arcade.php?do=play&gameid=20