

### Suggestions and/or Directions for Implementing Extended Concept (3) Answers

Students will benefit from pencils with erasers, if possible since revisions are part of learning. Students should be allowed to start on any page of these activities but try to keep on one page. Students should use their existing and current textbook(s) as a literacy reference for concepts. After completing Grouped Computation activities, students should assemble with team mates. Individuals and teams investigate & collect definitions & examples for concepts, then discuss. Students may revise their definitions and examples with improvement(s) after team discussion. As teachers mingle among teams collaborating on definitions & examples, they should facilitate learning by challenging students to complete their assignments by using textbooks and each other. Usually, stronger students finish first and they can revise their assignments with little or no help then as more challenged students finish, team leaders should discuss & revise with team mates. These collaborative teams should be carefully selected with a strong student as leader and there should not be more than 2 or 3 students in a collaborative team. Leader & team mates! Team Leaders should assist challenged students with revising and/or improving assignments. If not enough students are strong enough to be leaders then challenged work with challenged? Teachers mingle around classroom, when asked about a concept, suggest team mate's answer! If all of the team mates can not answer the question(s) then back to the textbook for more work. This will naturally and at first be a challenging and frustrating assignment however be persistent! This creates an atmosphere of students helping students & teachers facilitating concept activities. Completing, Discussing Activities, Revising Concepts, and Collaborating might need (2) periods. If any students want to take an assignment home then suggest waiting until team decides on results. Students may want to do them at home since parents will help or complete definitions & examples but only allow Parents involvement after the Team together has a chance to complete assignments!

Computational Activities alternate daily with Conceptual Activities. Every other Day!

Learning concepts is traditionally attempted with workbook exercises, classroom manipulatives, WWW exercises and manipulatives! Why not a “**Literacy Approach**” along with all the above?

Advanced Numbers \* Extended Concepts 3 A

Definitions should be re-stated or paraphrased textbook definitions not word for word!

After completing Basic Knowledge Activities, Collaborate with classmates, Provide or Receive Help!

Real & Virtual Manipulatives assist in achieving knowledge for Concepts & Computation!

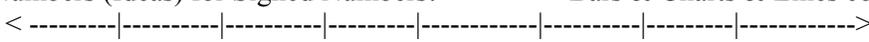
1. Define & provide an example(s) of Counting & Whole Numbers (Note Sets within Sets). Use PP to review!  
Mark Even & Odd Numbers within Whole Numbers! Mark Prime & Composite within Counting Numbers!  
Good idea to use Wikipedia and do an online investigation into Prime & Composite Numbers!  
Whole Numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, ... Even underlined and Odd not marked!  
Counting Ns: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, ... Prime Underlined & Composite not marked!

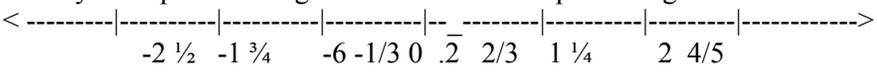
2. Define & provide an example(s) of Sets of Proper Fractions and Sets of Improper Fractions! Use PP to review!  
Provide at least (4) examples in each set! Include concepts of Increasing & Decreasing!  
Note: All proper fractions are between 0 and 1! Amazing how many and all between 0 and 1!  
Proper Fractions: N is less than D  $1/2$ ,  $2/3$ ,  $4/5$ ,  $6/7$ , and so on... Set is Increasing Lo to Hi!  
Improper Fractions: N is more than D  $8/7$ ,  $6/5$ ,  $5/4$ ,  $3/2$ , and so on... Set is Decreasing Hi to Lo!

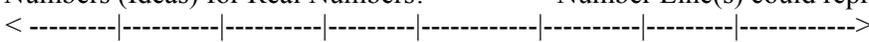
3. Define & Provide an example(s) of a Numbers (Ideas) and Numerals (Symbols)! Use PP to review!  
What would be Numbers (Ideas) for Fractions & Decimals! Circles & Rectangles could represent them!  
Create (2) circles! One with (3) equal regions and one with (4) equal regions! Shade one region in each circle!  
Create (2) rectangles! One with (3) equal regions and one with (4) equal regions! Shade one region in each rectangle!

4. Define & Provide example(s) of Mixed Numbers as Numbers (Ideas)! Use PP to review!  
What would be Numbers (Ideas) for Mixed Numbers! Circles & Rectangles could represent them!  
Create (2) circles! Both with (3) equal regions! Shade all of one and 1 part of the second (  $1\frac{1}{3}$  )!!  
Create (3) rectangles! Both with (4) equal regions! Shade all of two and 3 parts of the third (  $2\frac{3}{4}$  )!

5. Define & Provide example(s) of Decimals & Mixed Decimals as Numbers (Ideas)! Use PP to review!  
What would be Numbers (Ideas) for Decimal Numbers! Bars & Charts could represent them!  
There are many examples of using Bars and Charts for representing Decimals and Mixed Decimals!

6. Define & Provide example(s) of Integers (Signed Numbers) as Numbers (Ideas)! Use PP to review!  
What would be Numbers (Ideas) for Signed Numbers! Bars & Charts & Lines could represent them!  
  
There are many examples of using Bars and Charts ( Up and Down ) ( Above and Below )!  
There are many more examples of using Number Lines for representing Integers (Signed Numbers)!

7. Define & Provide example(s) of Real Numbers (Rational & Irrational) as Numbers (Ideas)! Use PP to review!  
What would be Numbers (Ideas) for Real Numbers! Number Line(s) could represent them!  
Think about terminating and repeating decimals too! How about Radicals too!  
There are many examples of using Number Lines for representing Real Numbers! Show All above on Line!  
  
 $-2\frac{1}{2}$   $-1\frac{3}{4}$   $-6$   $-1/3$   $0$   $.2$   $2/3$   $1\frac{1}{4}$   $2$   $4/5$

8. Define & Provide examples of Powers of Ten as Numbers (Ideas)! Use PP to review!  
What would be Numbers (Ideas) for Real Numbers! Number Line(s) could represent them?  
  
Create a Number Line and create Tic Marks going in both directions! Each Tic Mark is a Power of Ten!  
Positive Powers of Ten on the right and Negative Powers of Ten on the left!

Advanced Numbers \* Extended Concepts 3 B

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After completing Basic Knowledge Activities, Collaborate with classmates, Provide or Receive Help!  
Real & Virtual Manipulatives assist in achieving knowledge for Concepts & Computation!

1. Define and provide (4) examples for Whole Numbers changed to Fractions! Use PP to review!

Changing a Whole Number to a Fraction is an easy but sometimes tricky concept!

Place a (1) under each Whole Number:  $3/1$   $5/1$   $6/1$   $8/1$  that's all there is to it... ☺

2. Define and provide (4) examples for Fractions changed to Decimals! Use PP to review!

Fractions can be changed to Decimals by Dividing the Denominator into Numerator!  
 $1/2 = .5$   $2)1.0$   $3/4 = .75$   $4)3.00$   $4/5 = .8$   $5)4.0$   $2/3 = .333\dots$   $3)2.000$

3. Define and provide (4) examples for Decimals changed to Fractions! Use PP to review!

Decimals are Special Fractions with Denominators of 10, 100, 1000...  
 $.5 = 5/10 = 1/2$   $.75 = 75/100$   $.8 = 8/10 = 4/5$   $.333\dots = 3/10 + 3/100 + 3/1000\dots$

4. Define and provide (4) examples for Percents as Decimals & Fractions! Use PP to review!

Percents are Ratios with Denominators of 100 thus change % to Fraction then Decimal!!!  
 $25\% = 25/100 = .25 = 1/4$   $30\% = .30 = 3/10$   $15\% = 15/100 = .15$   $33\frac{1}{3}\% = 33\frac{1}{3}/100 = .333\dots$

5. Define and provide (4) examples for Decimals & Fractions as Percents! Use PP to review!

Just reverse the process of the above examples in #4  
 $.25 = 1/4 = 25/100 = 25\%$   $.30 = 3/10 = 30\%$   $15/100 = .15 = 15\%$   $33\frac{1}{3}/100 = .333\dots = 33\frac{1}{3}\%$

6. Define & provide example(s) of a Factors for ( 24 ) and ( 36 )! Use PP to review!

Factors divide into a number with no remainder! Quotient is another factor!  $24 = \{ 1,2,3,4,6,8,12,24 \}$

Factors divide into a number with no remainder! Quotient is another factor!  $36 = \{ 1,2,3,4,6,9,12,18,36 \}$

7. Define & provide example(s) of a Multiples for ( 3 ) and ( 7 )! Use PP to review!

Multiples are products of a number times 1, 2, 3, 4, 5,... Multiples of 3 = 3,6,9,12,15,...

Multiples are products of a number times 1, 2, 3, 4, 5,... Multiples of 7 = 7,14,21,28,35,...

8. Define & provide example(s) of a LCD for ( 2/3 ) & ( 4/7 ) for Addition & Subtraction! Use PP to review!

Least Common Denominator of 3 & 7 is 21!  $2/3 (7/7) + 4/7 (3/3) = 14/21 + 12/21 = 26/21 = 1\frac{5}{21}$

Least Common Denominator of 3 & 7 is 21!  $2/3 (7/7) - 4/7 (3/3) = 14/21 - 12/21 = 2/21$

Advanced Numbers \* Extended Concepts 3 C

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1. Define & provide examples of Exponents of 0,1,2,3 with Decimals and Fractions! Use PP to review!  
Provide (4) for Decimals and (4) for Fractions!

Extended Exponents are Decimals & Fractions with Exponent Notation...

$$.2^{+3} = .2 \times .2 \times .2 = .8 \quad .03^{+2} = .03 \times .03 = .0009 \quad .5^{+1} = .5 \quad .46^0 = 1$$

$$1/2^{+3} = 1/2 \times 1/2 \times 1/2 = 1/8 \quad 2/3^{+2} = 2/3 \times 2/3 = 4/9 \quad 2/3^{+1} = 2/3 \quad 2/3^0 = 1$$

2. Define & provide examples of Extended Radicals with Decimals and Fractions! Use PP to review!  
Provide (4) for Decimals and (4) for Fractions!

$$\sqrt{.09} = .3 \text{ since } .3 \times .3 = .09 \quad \sqrt{4/9} = 2/3 \text{ since } 2/3 \times 2/3 = 4/9$$

Just complete more of the same examples represented above!

3. Define & provide (1) comprehensive example of Order of Operations! Use PP to review!

$9 - 7 + 4[7 + (5 - 1)2]$	Subtract $5 - 1$	Inner most inclusion or parathenses
$9 - 7 + 4[7 + (4)2]$	Multiply $4 \times 2$	
$9 - 7 + 5[7 + 16]$	Add $7 + 16$	
$9 - 7 + 5[23]$	Multiply $5 \times 23$	Left to Right M, D, A, S
$9 - 7 + 115$	Subtract $9 - 7$	
$2 + 115 = 117$	Add $2 + 117$	

4. Define & provide (1) comprehensive example of Order of Operations! Use PP to review!

$[(4 + 1)2 - 3]/2 + 5 - 1$	Add $4 + 1$	Inner most inclusion or parathenses
$[(5)2 - 3]/2 + 5 - 1$	Multiply $5 \times 2$	
$[25 - 3]/2 + 5 - 1$	Subtract $25 - 3$	
$[22]/2 + 5 - 1$	Divide $22/2$	Left to Right M, D, A, S
$11 + 5 - 1$	Add $11 + 1$	
$16 - 1 = 15$	Subtract $16 - 1$	

5. Define & provide examples of Whole, Decimal, Fraction, Mixed, Exponent, Radical Extra for Experts!  
Proportion, Percent, Factor, Multiple, etc... Using One Look Dictionary! [www.onelook.com](http://www.onelook.com)

A rather straight forward Library or Literacy exercise or activity! But 21<sup>st</sup> Century Skills being used!

6. Provide Names and comments on Math Dictionaries found by One Look Dicitonary! Extra for Experts!  
Note: One Look Dictionary locates other dictionaries on the WWW not definitions!

A rather straight forward Library or Literacy exercise or activity! But 21<sup>st</sup> Century Skills being used!

7. Define & provide examples of Mathematics, Arithmetic, Algebra, Geometry, Calculus! Extra for Experts!  
Using either Wikipedia: [www.wikipedia.org](http://www.wikipedia.org) (or) Love to Know: [www.1911encyclopedia.org](http://www.1911encyclopedia.org)

A rather straight forward Library or Literacy exercise or activity! But 21<sup>st</sup> Century Skills being used!

8. Define & provide examples of useful information found at Extra for Experts!  
The Single Best Source of Facts on the WWW (So they say!): [www.refdesk.com](http://www.refdesk.com)

A rather straight forward Library or Literacy exercise or activity! But 21<sup>st</sup> Century Skills being used!

Advanced Numbers \* Extended Concepts 3 D

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After completing Conceptual Activities, Students gather in Teams and Collaborate! Provide or Receive Help!

These Conceptual Activities can be done Individual or in Collaborative Teams! But always supervised!

1. Define and provide an example of a number and a numeral! Augments computation!

This is as any Good Teacher would have you do! Repeat an activity that is most important!

2. Define and provide an example for proper and improper fractions. Augments computation!

This is as any Good Teacher would have you do! Repeat an activity that is most important!

3. Define and provide an example for simple and mixed decimal. Augments computation!

This is as any Good Teacher would have you do! Repeat an activity that is most important!

4. Define and provide an example(s) for Fraction(s), N&D, P&I, Mixed Number. Augments computation!

This is as any Good Teacher would have you do! Repeat an activity that is most important!

5. Define & provide example of of exponents 0 to 3 as in Beginning Numbers 1 Augments computation!

This is as any Good Teacher would have you do! Repeat an activity that is most important!

6. Define & provide examples of any four simple radicals as in Beginning Numbers 1. Augments computation!

This is as any Good Teacher would have you do! Repeat an activity that is most important!

7. Define & provide an example of a proportion and apply The Law for Proportions! Augments computation!

This is as any Good Teacher would have you do! Repeat an activity that is most important!

8. Define & provide an example of a percentage then change to a proportion & solve! Augments computation!

This is as any Good Teacher would have you do! Repeat an activity that is most important!