Suggestions and/or Directions for Implementing Extended Concept (2) 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 <u>workbook</u> exercises, <u>classroom</u> manipulatives, WWW exercises and manipulatives! Why not a "**Literacy Approach**" along with all the above?

Intermediate Numbers * Extended Concepts 2 A
Definitions should be re-stated or paraphrased textbook definitions not word for word!
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!

Note: Students should try to say, as best they can, in their own words what they are doing in the #1,2,3,4…

1. Define and provide an example for Carrying while adding in Addition! Review PP Lecture!
Transferring a Digit from one column to another column of higher value during Addition computations!

Example: 11 In first column, the sum of 12 is obtained with Addition and the 2
473 is placed under the 9 while the 1 ten is transferred to the next
+69 column which is the Tens Column. Thus a Carry is performed!
542 Check Problem by Adding 473 to 69! Reversing the Numbers!

2. Define and provide an example for Borrowing while subtracting in Subtraction! Review PP Lecture!
Transferring a Digit from one column to another column of lower value during Subtraction computations!

Example: 11 In first column, the 8 can't be Subtracted from the 3 so a Borrow
473 from the 7 is made making it 6 and the 3 becomes 13! Thus 8
-98 can be subtracted from the 13 and a 5 is obtained. Thus a Borrow!
375 Check Problem by adding 98 to 375 thus 473 should be obtained!

3. Define and provide example of Partial Products with Multiplication! (3 Digit X 2 Digit) Review PP Lecture!
Multiplying with at least two multipliers to obtain Partial Products! Add Partial Products in Staggered Format

Example: 2 In the first column, 5x4 yields 20 but place 0 under 5 and carry 2 to next
324 Column. Then 5x2 =10+2 so put 2 under 6 and carry 1. Then 5x3=15+1!
X65 First Partial Product = 1620! Now, Second Partial Product is generated
1620 by 6 and the Second Partial Product must start under 2 in First Partial!
1944Final Product: 21060

4. Define and provide example of Remainder in Division with Mixed Number as Result! Review PP Lecture!
Division with a Remainder written as a Proper Fraction with Quotient as a Whole to yield a Mixed Number!

Example: 65 Divide the 5 into 32 and it goes in 6 times with 30 subtracted from 32
5) 326 subtracting the 30 yields 26. Divide the 5 into 26 and it goes in 5 times
-30 yielding 25 subtracted from 26 yielding a 1 for a Remainder!
26 Thus the Final Answer is the Quotient 65 and 1/5 ….
-25 Thus R = 1 Final Answer = 6 1/5

5. Define and provide an example for Numbers as Ideas or Values! Review PP Lecture!
Numbers are Values or Ideas which are best expressed as Marks!
Three means # # # or * * * Five means @ @ @ @ @ or = = = = =
Symbols are a creation of Ancient Societies getting tired of counting and marking down!
Marking down was and is known as Tally… Just counting and writing a Symbol is much easier!!!

6. Define and provide an example for Numerals as Symbols or Notations! Review PP Lecture!
Numerals are Symbols that represent Values or Ideas! From an Early Beginning: Roman Numerals
Our Modern Day Decimal Number (Numeral) System comes from Hindu-Arabic Numeral System.
1,2,3,4,5,6,7,8,9, 0 Search Wikipedia: Hindu Arabic Number System

7. Define and provide an example for Relations as in (< = >)! Review PP Lecture!
Relation Symbols or Inequality & Equality Relations represent relative value of numbers or numerals!
The most common and most used is Equal = noting Horizontal Bars equally spaced!
The Less than Symbol < means the value on the left is smaller or less than the one on the right.
The More than Symbol > means the value on the left is larger or more than the one on the right.
Note the Bars on Less Than and More Than touch at the smaller of the two values!!!

8. Define and provide an example for Operations as in (+, -, x, /)! Review PP Lecture!
Operations are Symbols that indicate some type of computation Simple or Complex must be completed!
These Operations follow a strict procedure for any and all Number Types which are computed!
A quick way to find more than enough information on any or all of these operations is do a
Wikipedia search for each operation… However, many times you get more than you want!

Intermediate Numbers * Extended Concepts 2 B

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

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. List (6) Fundamental Properties of Numbers. Use Acronym: CCAIID What is an Acronym? Review PP Lecture!

CCAIID: Closure, Commutative, Associative, Identity, Inverse, Distributive

An Acronym is a word made from the first letters of a group of words.

2. Using Even & Odd Numbers & (+)(-): Define & provide (4) examples of the Closure Property! Review PP Lecture!

Closure Property states if any two Ns of a number set with an operation yields a number of the number set.

(2) + (4) = 6 Even with (+) are Closed (3) + (5) = 8 Odd with (+) are Not Closed

(2) - (4) = -2 Even with (-) are Not closed (5) - (3) = +2 Odd with (-) are Not closed

Does one or even 100 example(s) of a property prove the property exists for All Numbers in a Number Set?

3. Using Even & Odd Numbers & (+)(-): Define & provide (4) examples of Commutative Property! Review PP Lecture!

Commutative Property states if any two Ns of a number set with an operation are equal if order reversed!

(2) + (4) = (4) + (2) (3) + (5) = (3) + (5) Even and Odd with (+) are Commutative

(2) - (4) = (4) - (2) (3) - (5) = (3) - (5) Even and Odd with (-) are Not Commutative

Does one or even 100 example(s) of a property prove the property exists for All Numbers in a Number Set?

4. Using Even & Odd Numbers & (+)(-): Define & provide (2) examples of Associative Property! Review PP Lecture!

Associative Property states if any three Ns of a number set with an operation can be operated in any group.

[(2)+(4)]+(6)= (2)+[(4)+(6)] [(3)+(5)]+(7)= (3)+[(5)+(7)] Even & Odd with (+) are Associative

[(2)-(4)]-(6)= (2)-[(4)-(6)] [(3)- (5)]-(7)= (3)-[(5)-(7)] Even & Odd with (-) are Not Associative

Does one or even 100 example(s) of a property prove the property exists for All Numbers in a Number Set?

5. Using Even & Odd Numbers & (+)(X): Define & provide (2) examples of Identify Property! Review PP Lecture!

Identity Property states any if N of a set with operation does not change any other number it is an Identity!

(2) + (0) = 2 Even with (+) have an Identify! (3) + (0) = 3 Odd with (+) have an Identify!

(2) - (0) = 2 Even with (-) have an Identify! (3) - (0) = 3 Even with (-) have an Identify!

Does one or even 100 example(s) of a property prove the property exists for All Numbers in a Number Set?

6. Using Even & Odd Numbers & (+)(X): Define & provide (2) examples of Inverse Property! Review PP Lecture!

Inverse Property states if any two same Ns of a set with an operation yield a unique number, it is Inverse!

(2) + (2) = 4 Even with (+) do not have an Inverse! (3) + (3) = 6 Odd with (+) do not have an Inverse!

(2) x (2) = 4 Even with (x) do not have an Inverse! (3) x (3) = 9 Odd with (x) do not have an Inverse!

Does one or even 100 example(s) of a property prove the property exists for All Numbers in a Number Set?

7. Using Even & Odd Numbers & (+)(X): Define & provide (2) examples of Distributive Property! Review PP Lecture!

Distributive Property states a Number may be dispersed over a sum of two numbers & equal same value.

(2)[(4)+(6)]= [(2)(4)]+[(2)(6)] thus (2)x(10) = (8)+(12) Multiplication can be distributive over addition!

(2)[(4) - (6)]= [(2)(4)] - [(2)(6)] thus (2)x(-2) <> (8)-(12) Multiplication can not be distributive over subtraction!

Does one or even 100 example(s) of a property prove the property exists for All Numbers in a Number Set?

8. Which (2) Properties seem to have more manipulative properties than others. Show examples! Review PP Lecture!

Addition & Multiplication has more properties then they are the (2) properties in question.<> means not equal!

2+3 = 3+2 2-3 <> 3-2 2x3 = 3x2 2 / 3 <> 3 / 2

Subtraction and Division act as counter examples!

Intermediate Numbers * Extended Concepts 2 C

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

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 (3) examples of Rounding with Whole Numbers! (Below, Halfway, Above) Review PP Lecture!
   Examples: Round to Hundreds 435 Round to Hundreds 753 Round to Hundreds 682
   Defined in words: If the Number to the right of the Digit to be Rounded is
   Above 5 then Round UP! Below 5 then remains the same! Exactly 5 then remains the same!
   Rounded to Hundreds: 435 => 400 753 => 700 682 => 700
   Why does a number remain the same when it is exactly in the Middle?

2. Define and provide (2) examples of Estimating with Whole Numbers! Using (+) & (X)! Review PP Lecture!
   Examples: Estimate the Product of (3,487) x (65,925) => 180,000,000
   Defined in words: Estimating is Rounding Numbers for quick answers & predictions!
   Suggested Procedure: Round to Single Digit! Multiple Single Digits! Use Zeros from Rounding
   Examples: Estimate the Sum of (3,487) x (65,925) => 69,000

3. Define and provide an example for Scientific Notation using a Large Number! Review PP Lecture!
   Scientific Notation is specifically for Large or Small Numbers to be easily computed.
   Scientific Notation is the product of a number between 0 & 1 times a power of ten.
   Standard Notation: 6,275,839 Scientific Notation: $6.3 \times 10^{+6}$ Note rounding to tens!

4. Define and provide an example for Scientific Notation using a Small Number! Review PP Lecture!
   Scientific Notation is specifically for Large or Small Numbers to be easily computed.
   Scientific Notation is the product of a number between 0 & 1 times a power of ten.
   Standard Notation: .0000437 Scientific Notation: 4.4×10^{-5} Note rounding to tens!
   Note: $1000 = 10^{+3}$ $100 = 10^{+2}$ $10 = 10^{+1}$ $1 = 10^{0}$ $.1 = 10^{-1}$ $.01 = 10^{-2}$ $.001 = 10^{-3}$
   Powers of Ten are generated in the Metric Number System which provides Small Scientific Notation…

5. Define and provide an example for Reducing Fractions to Lowest Terms! Review PP Lecture!
   Reducing is the changing the Terms (C) of a Fraction without changing the Fraction Value!
   The most correct way is to use GCF or Greatest Common Factor which will Reduce to Lowest Terms!
   Other common and useful ways is to Reduce by a Common Factor then do it again until Lowest Terms!
   Reduce: 6/8 (6/2 / 8/2) = 3/4 6/9 (6/3 / 9/3) = 2/3 16/20 (16/4 / 20/4) = 4/5

6. Define and provide (2) examples for Changing Fractions to a Specific Denominator! Review PP Lecture!
   Raising is the changing of Terms (Numerator & Denominator) with changing the Fraction Value!
   The correct way is to use a Factor which complies with the Requested Term for the Denominator!
   The Procedure of Raising is to Multiple both the N & D by a Factor that complies with Requested D!!!
   Raise to 6ths: 2/3 =(2x2 / 3x2) = 4/6 Raise to 10ths: 3/5 =(3x2 / 5x2) = 6/10

7. Define and provide an example for determining a Least Common Multiple (LCM)! Review PP Lecture!
   The Least Common Multiple is the Small Number that is a Multiple of Two Numbers!
   Find the First Five Multiples of 3 & 5: 3,6,9,12,15, … 5, 15, 15, 20, 25…. Thus LCM is 15…
   Find the First Five Multiples of 4 & 6: 4,8,12,16,24, … 6,12,18,24,36… Thus LCM is 12…
   Remember to Find Multiples: Multiply the Number by 1,2,3,4,5… Thus Multiples of Whatever!!!

8. Define and provide an example for determining Least Common Denominator (LCD)! Review PP Lecture!
   The Least Common Denominator is the Small Number that is a Multiple of Two Denominators!
   Find 5 Multiples Denominators of 2/3 & 4/5: 3,6,9,12,15, … 5, 15, 15, 20, 25…. Thus LCD is 15…
   Find Five Multiples Denominators of 3/4 & 5/6:4,8,12,16,24, … 6,12,18,24,36… Thus LCD is 12…
   Remember to Find Multiples: Multiply the Number by 1,2,3,4,5… Thus Multiples of Whatever!!!

Intermediate Numbers * Extended Concepts 2 D
Definitions should be re-stated or paraphrased <u>textbook</u> definitions <u>not</u> word for word!
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 (4) example(s) of Higher Exponents with a Power of 3! Review PP Lecture!
Higher Exponents mean only to do a Repeated Multiply of the Base Number more times…
Special Exponents of 0 and 1 yield special results….
2^3 = 2x2x2 = 8 5^3 = 5x5x5 = 125
7^3 = 7x7x7 = 343 9^3 = 9x9x9 = 729

2. Define and provide (4) examples with an Exponent of (2) with Bases of Fractions! Review PP Lecture!
Higher Exponents mean only to do a Repeated Multiply of the Base Number more times…
Special Exponents of 0 and 1 yield special results….
$(1/3)^2$ = 1/3x1/3 = 1/9 $(3/4)^2$ = 3/4x3/4 = 9/16
$(2/3)^2$ = 2/3x2/3 = 4/9 $(4/5)^2$ = 4/5x4/5 = 16/25

3. Define and provide (4) examples with an Exponent (2) with Bases of Decimals! Review PP Lecture!
Higher Exponents mean only to do a Repeated Multiply of the Base Number more times…
Special Exponents of 0 and 1 yield special results….
$(.02)^2$ = .02x.02 = .0004 $(.8)^2$ = .8x.8=.64
$(.4)^2$ = .4x.4=.16 $(.15)^2$ = .15x.15=.0225

4. Define and provide (4) example(s) for Larger Radicals (Square Roots: 100 to 400)! Review PP Lecture!
Larger Radicals for Intermediate Numbers are from 11 to 20!

$\sqrt{144}$ = 12 since 12 x 12=144 $\sqrt{324}$ = 18 since 18 x 18 = 324

$\sqrt{196}$ = 14 since 14 x 14=196 $\sqrt{256}$ = 16 since 16 x 16 = 256

5. Define and provide (4) examples with an Exponent of (2) with Bases of Fractions! Review PP Lecture!
Special Radicals for Intermediate Numbers are special multiplication!

$\sqrt{1/9}$ = 1/3 since 1/3 x 1/3=1/9 $\sqrt{4/49}$ = 2/7 since 2/7 x 2/7 = 4/49

$\sqrt{1/4}$ = 1/2 since 1/2 x 1/2=1/4 $\sqrt{9/25}$ = 3/5 since 3/5 x 3/5 = 9/25

6. Define and provide (4) examples with an Exponent (2) with Bases of Decimals! Review PP Lecture!
Larger Radicals for Intermediate Numbers are special multiplication!

$\sqrt{.04}$ = .2 since .2 x .2 = .04 $\sqrt{.0036}$ = .06 since .06 x .06 = .0036

$\sqrt{.09}$ = .3 since .3 x .3 = .09 $\sqrt{.0004}$ = .02 since .02 x .02 = .0004

7. Define and provide an example for Number Facts (+, -, x, /) as Problems! Review PP Lecture!
<u>Arithmetic Facts</u> provide Parts to a Problem <u>and</u> Require the Answer!!!

2 + 3 ___ 5 – 2 - ___ 4 x 7 = ___ 6 / 2 = ___

8. Define and provide an example for Algebra Facts (+, -, x, /) as Problems! Review PP Lecture!
<u>Algebra Facts</u> provide a Part and the Answer <u>and</u> Require the Missing Part!!!

___ + 3 = 8 9 - ___ = 4 ___ x 5 = 10 12 / ___ = 4