Title: Place Value for Primary Grades - A Place for Everything
Apply knowledge of whole numbers and place value to thousands.

Brief Overview:

The students will use prior knowledge and manipulatives to explore the concept of place value to 1,000. They will investigate placing items into groups of 10 and understanding each place can only have up to nine items.

NCTM Content Standard/National Science Education Standard:
Number and Operations

Grade/Level:
Grades 2-3

Duration/Length:
3 days (60 minutes each day)

Student Outcomes:

Students will:

- Read, write, and represent whole numbers using symbols, words, and models.
- Express whole numbers using expanded form.
- Identify the place value of a digit in a number.

Materials and Resources:

- Egg carton
- Colored paper plates labeled ones (yellow), tens (red), hundreds (blue) and thousands (white). (Four plates for each group)
- Digit cards numbered 0-9 for each group
- Rubber bands for each group
- 1239 craft sticks for each group
- Base ten blocks
- Overhead base ten blocks
- Place Value Diagram (SR1)
- Egg carton
- Journal Prompt (SR2)
- Black Construction Paper
- White Crayons
- Digit Cards (SR3)
- Star stickers
- How Much is A Million?, by David M. Schwartz
- Places in Space (SR4**)**
- Dice
- Chasing Dragons Game Board (SR5)
- Journal Prompt (SR6)
- Puppy Code Riddle (SR7)
- Place Value Assessment (SR8)

- TR1 Answer Key for Places in Space
- TR2 Answer Key for Puppy Code
- TR3 Answer Key for Place Value Assessment
- TR4 Teacher Observational Checklist

Development/Procedures:

Lesson 1 Place Value with Craft Sticks

Preassessment – Share base ten blocks and place value charts with students. Ask them to make numbers using the base ten blocks. Assess prior knowledge of place value. Give students numbers orally and ask students to make the numbers using the base ten blocks and place value charts. For example ask the student to represent the number 62. (They should have 6 tens and 2 ones) Make note of the students that have represented the number correctly. Invite students to share what they have discovered. Pre-assess student's ability to describe the value of each digit.

Launch – Explore the concept of grouping numbers with the students. Show them an egg carton and ask them how many eggs are in a dozen. Ask students how many ones are in a dozen. How many tens are in a dozen? Suppose we had 14 eggs, would we still have a dozen eggs? How many would we have? Ask students how many days are in a week? If there are ten days until your birthday , would that still be a week? Guide them to the understanding of various groupings of items. Ask students for possible examples: number of crayons in a box, number of lifesavers in a roll, etc.

Teacher Facilitation – Give each group of students a pile of craft sticks and several rubber bands. Ask students for ideas for grouping the sticks to facilitate counting. Elicit grouping in sets of ten . Teacher will model using overhead base ten blocks various ways to group. Ask for ten volunteers to bring their bundle of 10 to the front of classroom. These ten students will form 100 with their 10 bundles. Have students use their place value charts as you model the concept of grouping. In a class discussion lead students to the understanding of ones, tens, and hundreds place value.

Student Application – Have each group divide their 1,239 sticks into groups of 10 and use their rubber bands to bundle groups of 10. Then put groups of 10 into bundles of 100. Ask students how many sticks they will have left over that can not be put into a bundle. Have students complete Place Value Diagram (SR1) and review directions. Discuss with the students as a group what would happen if they had 10 bundles of 10. What would they have? What would 100 bundles of 10 equal? Lead students to the realization that 10 groups of 100's will be 1000.

Embedded Assessment – Distribute Journal Prompt (SR2). Students will complete journal prompt after generating criteria for completion. Examples of criteria could be: specific examples of groups of ten in real life situations, and why grouping in 10's is useful.

Reteaching/Extension – Invite students to model three or four digit number using grouped craft sticks and write the number in word form and standard form on their place value chart.

Lesson 2 Building Place Value with Paper Plates

Preassessment – Give students place value mats and Digit Cards (SR3). Display numbers using overhead base ten blocks. Students will use their digit cards to make the numbers on their place value charts. Assess student's understanding of whole numbers and place value using the Teacher Observational Checklist (TR4).

Launch – Have students count by tens up to 100. Read the story How Much is a Million?, by David M. Schwartz. Give students stars, black paper and a white crayon. Check their understanding of the concept by using pictorial representations. Then have students create a night sky by using one star to represent 10. Therefore, 10 stars would equal one hundred, and 10 groups of stars would equal 1000. The students are creating a night sky of 1000 stars. The students will write the number 1000 in white crayon.

Teacher Facilitation – Distribute colored paper plates, craft sticks, rubber bands, digit cards and place value chart to each group. The colored plates will be labeled as such: yellow-ones, red-tens, blue-hundreds and white-thousands. Teacher will model paper plate activity. Teacher will draw one digit card and write the number on the place value chart in the ones column. Then the teacher will place the appropriate number of craft sticks on the correct place value plate. Continue to draw two additional cards and repeat the above procedure for the tens and hundreds place. Remind students that only one number can be placed in each column. Divide the students into two groups. Pull one digit card and half the class decides which place value column the card should go in. Use think-aloud model reasoning behind choices. For example: teacher pulls an 8 for group 1 and they decide to put it in the thousands place. Then a 6 is pulled for group 2 and they put the 6 in the hundreds place. Have students use their place value charts as the teams explore place value. In a class discussion have students summarize what they have learned with this activity.

Student Application – Divide the class into two teams. Have each group draw their first digit card and continue using their place value math during the activity. For practice and application of the concept students should play 3 rounds of this game. After three rounds the students try to make the smallest number possible with the digit cards they have drawn. Teacher should make observations of students as they work and complete an observation checklist.

Embedded Assessment – Distribute the worksheet Places in Space (SR4) to students. Review directions with students. Students will complete worksheet after discussing criteria for completion. Examples of criteria could be: grouping by 10, place value and number placement. Answer key may be found on TR1.

Reteaching/Extension – Ask students to generate numbers from their place value chart and write the numbers in their journals in standard form, word form and possible pictorial representation. For example 1269 written in standard form, 1269 written in pictorial form, and 1269 written in word form.

Lesson 3 Chasing Dragons in Place Value

Preassessment – Give students a place value chart and base ten blocks. Teacher will have expanded numbers on the overhead. Students will use base ten blocks to make the numbers on the overhead. Then have students write the number in standard form. Assess each student's understanding of correct representation of place value and begin discussion of expanded form.

Launch – Show students chart paper with three columns marked A, B and C. Cards will be placed in random order on chart representing standard form, word form and expanded form. Make sure that one column has all numbers written in expanded form while another column will have word form. The remaining column will contain numbers represented in standard form. Students will be asked to reorganize the cards so that the value will match horizontally. What do the students notice? Elicit response from students for each column. Have students give each column a title. Reveal math terms for each column.

Teacher Facilitation – Model expanded form by having the teacher roll a die and write the number on the board or overhead. The teacher would roll the die four times and create a number in standard form. Then the number, (for example 3,124), would be decomposed by the teacher. Ask students to help you brainstorm ways to decompose the rest of the numbers. Teacher would model four or five examples for students. In a class discussion have students share their favorite way of representing numbers; standard form or expanded form.

Student Application – Give students Chasing Dragons game board (SR5), directions and die. Go over directions with the students. For practice and application students should play 4 rounds of this game. Teacher should make observations of students as they work and complete an observation checklist.

Embedded Assessment – Distribute Journal Prompt (SR6). Students should complete journal prompt after discussing criteria for completion. Examples of criteria could be: understanding of expanded form and or standard form with examples of place value in real life.

Reteaching/Extension – Ask students to use their digit numbers and their place value chart to write numbers in standard and expanded form that exist in real life. Give students Puppy Code Riddle (SR7). Review directions. Students will use expanded form to solve the riddle. Check their understanding of the concept by answering the riddle correctly. Answer key may be found on TR2

Summative Assessment:

The student will be assessed on their understanding of the place value concept by completing Place Value Assessment (SR8). They will answer questions pertaining to standard form, whole numbers, expanded form and place value. Answer key may be found on TR3.

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Place Value Diagram

Student Resource Sheet 1

Thousands	Hundreds	Tens	Ones

Journal Prompt

Tell why you think grouping objects in groups of **10** is helpful. What are some examples of things grouped in **tens** that you can think of?

Scoring Criteria

☐ _____

☐ _____

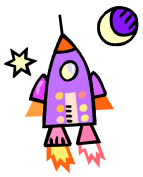
☐ _____

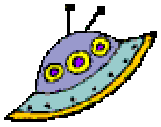
☐ _____

Digit Cards

Student Resource Sheet 3

1	2	3
4	5	6
7	8	9
0	0	0





Places in Space

Name_____

Match the underlined digit in each number to the appropriate value. Use the number of each problem to locate the correct letter in order to solve the riddle.

1. **3128**
ones = W
tens = P
hundreds = A
thousands = I

2. **8312**
ones = E
tens = N
hundreds = C
thousands = H

3. **2831**
ones = X
tens = S
hundreds = R
thousands = U

4. **9627**
ones = Z
tens = T
hundreds = H
thousands = F

5. **1568**
ones = V
tens = N
hundreds = X
thousands = U

6. **4283**
ones = S
tens = T
hundreds = E
thousands = P

7. **5674**
ones = T
tens = M
hundreds = A
thousands = Z

8. **2137**
ones = L
tens = C
hundreds = X
thousands = P

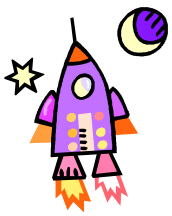
9. **7523**
ones = W
tens = O
hundreds = Y
thousands = S

10. **1943**
ones = X
tens = W
hundreds = C
thousands = I

11. **6821**
ones = E
tens = Q
hundreds = R
thousands = B

Where did the astronaut put his sandwich?

__	__		__	__	__		__	__	__	__	__	__	__	__	__	.
1	2		4	1	6		8	7	5	2	10	4	11	9	3	



Name_____

Places in Space

Match the underlined digit in each number to the appropriate value. Use the number of each problem to locate the correct letter in order to solve the riddle.

1. 3,128
ones = W
tens = P
hundreds = A
thousands = I

5. 1,568
ones = V
tens = N
hundreds = X
thousands = U

9. 7,523
ones = W
tens = O
hundreds = Y
thousands = S

5. 8,312
ones = E
tens = N
hundreds = C
thousands = H

6. 4,283
ones = S
tens = T
hundreds = E
thousands = P

10. 1,943
ones = X
tens = W
hundreds = C
thousands = I

6. 2,831
ones = X
tens = S
hundreds = R
thousands = U

7. 5,674
ones = T
tens = M
hundreds = A
thousands = Z

11. 6,821
ones = E
tens = Q
hundreds = R
thousands = B

7. 9,627
ones = Z
tens = T
hundreds = H
thousands = F

8. 2,137
ones = L
tens = C
hundreds = X
thousands = P

Where did the astronaut put his sandwich?

I	N		H	I	S		L	A	U	N	C	H		B	O	X
1	2		4	1	6		8	7	5	2	10	4		11	9	3

Puppy Code

Student Resource Sheet 7

Name_____

Riddle: What do puppies and trees have in common?

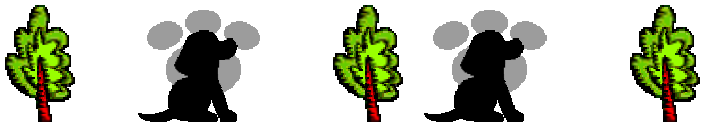
Directions: Find the corresponding numbers below. Use the decoder to solve the riddle by filling in the spaces at the bottom of the page.

1. 50 + 6
2. 160 + 2
3. 1000 + 900 + 70 + 6
4. 800 + 50 + 2
5. 10 + 2
6. 60 + 7
7. 9000 + 200 + 30 + 5
8. 500 + 70 + 5

Decoder

56	A	852	K
9235	T	12	B
162	I	67	E
1976	R	575	H

___	___	___	___	___		___	___	___	___
7	8	6	2	3		5	1	3	4



Name_____

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Directions: Find the corresponding numbers below. Use the decoder to solve the riddle by filling in the spaces at the bottom of the page.

1. 50 + 6
2. 160 + 2
3. 1000 + 900 + 70 + 6
4. 800 + 50 + 2
5. 10 + 2
6. 60 + 7
7. 9000 + 200 + 30 + 5
8. 500 + 70 + 5

Decoder

56	A	852	K
9235	T	12	B
162	I	67	E
1976	R	575	H

T	H	E	I	R		B	A	R	K
7	8	6	2	3		5	1	3	4

Chasing Dragons

Name_____

George
Thousands Place

Juliette
Hundreds Place

Molly
Tens Place

Charlie
Ones Place

1000's	**100's**	**10's**	**1's**
1	**2**	**3**	**4**

1000 + 200 + 30 + 4

Round 1
Number _____ _____ _____ _____

Expanded form

Round 2
Number _____ _____ _____ _____

Expanded form

Round 3
Number _____ _____ _____ _____

Expanded form

Round 4
Number _____ _____ _____ _____

Expanded form

Chasing Dragons

Use strategies to capture dragons while learning about the expanded form of place value. The object of the game is to create a four digit number. In the last round create the largest four digit number possible.

You will need: Chasing Dragons Sheet, 1 die and a pencil.

Directions:

1. Review place value to the thousands place.

2. Roll a die and choose a dragon that you want to capture. Record your number in the appropriate place value blank for round one.

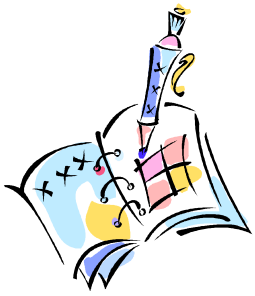
3. Write the number in expanded form beneath the blank.

4. A particular dragon can only be captured once per round. The round ends when all four dragons have been captured.

5. Continue rolling and recording until all blanks for each round are filled.

Student Resource Sheet 6

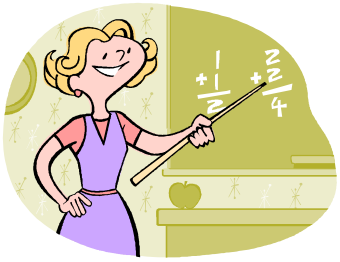
Journal Prompt



Explain why you think **place value** is so important.

Scoring Criteria

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____



Place Value Assessment - Student Resource #8

Name: _____ Date: _____

1. What number represents the hundreds place in the number 425?

    b. 5
    c. 2
    d. 4
    e. 20

2. Write the number 1,153 in expanded form.

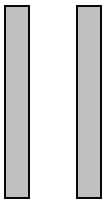
    b. 100 + 50 + 3
    c. 1,000 + 100 + 50 + 3
    d. 50 + 3
    e. 3

3. ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ What number do the blocks represent?

    b. 1
    c. 2
    d. 10
    e. 200

4. If you had 9 blocks of one, 1 rod of ten and 1cube of a hundred, what total number would you have?

    b. 911
    c. 11
    d. 1,119
    e. 119

5.  If these rods represent the tens place how many tens would you have?

    b. 2
    c. 1
    d. 6
    e. 10

6. In the number 4567 the number 4 represents which place value?

    b. ones
    c. tens
    d. hundreds
    e. thousands

7. In the number 8511 the number 5 represents which place value?

    b. ones
    c. tens
    d. hundreds
    e. thousands

Place Value Response

Sam and Joe loved gummy bears. Sam ate 10 lemon + 5 grape gummy bears on Sunday and Joe ate 30 strawberry + 9 lime gummy bears on Sunday.

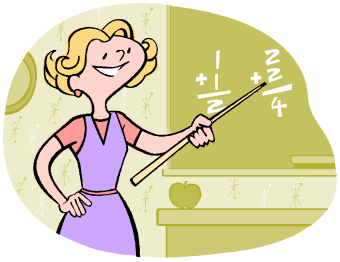
Part A

Write each number in standard form.

_____	_____
Sam	Joe

Part B

Which boy ate more gummy bears on Sunday? Write your explanation using what you know about place value. Use words, symbols or numbers in your answer.



Place Value Assessment - Teacher Resource #3

Name: _____ Date: _____

1. What number represents the hundreds place in the number 425?

   a. 5
   b. 2
   c. 4
   d. 20

2. Write the number 1,153 in expanded form.

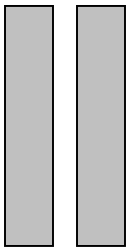
   a. 100 + 50 + 3
   b. 1,000 + 100 + 50 + 3
   c. 50 + 3
   d. 3

3. ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ What number do the blocks represent?

   a. 1
   b. 2
   c. 10
   d. 200

4. If you had 9 blocks of one, 1 rod of ten and 1cube of a hundred, what number would you have?

   a. 911
   b. 11
   c. 1,119
   d. 119

5.  If these rods represent the tens place how many tens would you have?

   a. 2
   b. 1
   c. 6
   d. 10

6. In the number 4567 the number 4 represents which place value?

   a. ones
   b. tens
   c. hundreds
   d. thousands

7. In the number 8511 the number 5 represents which place value?

    a. ones
    b. tens
    c. hundreds
    d. thousands

BCR – Place Value
Sam and Joe loved gummy bears. Sam ate 10 lemon + 5 grape gummy bears on Sunday and Joe ate 30 strawberry + 9 lime gummy bears on Sunday.

Part A
Write each number in standard form.

15	39
Sam	Joe

Part B
Which boy ate more gummy bears on Sunday? Write your explanation using what you know about place value. Use words, symbols or numbers in your answer.

Joe ate more gummy bears. Answers will vary.

Teacher Observational Checklist

Teacher Resource 4

Outcomes/ Criteria	Name	Name	Name	Name	Name	Name	Name

Anecdotal Information / Evaluation Scale