

Place Value to 999,999

Lesson Synopsis:

Students use base-ten blocks and place value charts to describe place value in numbers up to 999,999. Standard form, expanded notation, word form, and the value of each digit will be investigated.

TEKS:

3.1 *Number, operation, and quantitative reasoning. The student uses place value to communicate about increasingly large whole numbers in verbal and written form, including money.*

3.1A Use place value to read, write (in symbols and words), and describe the value of whole numbers through 999,999.

Process TEKS:

3.14 *Underlying processes and mathematical tools. The student applies Grade 3 mathematics to solve problems connected to everyday experiences and activities in and outside of school.*

3.14D Use tools such as real objects, manipulatives, and technology to solve problems.

3.15 *Underlying processes and mathematical tools. The student communicates about Grade 3 mathematics using informal language.*

3.15A Explain and record observations using objects, words, pictures, numbers, and technology.

3.15B Relate informal language to mathematical language and symbols

Related TEKS:

3.1 *Number, operation, and quantitative reasoning. The student uses place value to communicate about increasingly large whole numbers in verbal and written form, including money.*

3.1C Determine the value of a collection of coins and bills.

GETTING READY FOR INSTRUCTION

Performance Indicator(s):

- Use a multiple representations chart to describe, read, and write (in symbols and words) the place value of whole numbers up to 999,999. (3.1A)

ELPS: 1E, 2E, 2I, 3D, 3H, 4E, 5B, 5G

Key Understandings and Guiding Questions:

- Place value can be used to describe, read and write (in symbols and words) the value of whole numbers through 999,999.
 - What is the difference between standard form and expanded notation?
 - What is the difference between a digit and the value of the digit?
 - How is a zero used in standard form, expanded notation and word form?

Vocabulary of Instruction:

- | | | |
|---------------|-------------|---------------------|
| • place value | • one | • ten-thousands |
| • digit | • tens | • hundred-thousands |
| • period | • hundreds | • expanded notation |
| • unit | • thousands | • standard form |

Materials:

- | | | |
|---|---|--|
| • base-ten blocks (at least ten 100-flats, ten 10-longs, and ten units in each bag) (1 bag per group) | • math journal (1 per student) | 10-longs, and ten units in each set) (1 set per teacher) |
| • pipe cleaners (1 per group and 1 per teacher) | • base-ten 1000-cubes (at least 1 per teacher and at least 4 per group) | • storage bags |
| | • overhead base-ten blocks (ten 100-flats, ten | |

Resources:

• SPIRALING REVIEW

Each day will begin with a short spiraling review which is designed to revisit previously introduced concepts and act as a quick student assessment. It is recommended that students be given 5 – 6 minutes to complete the daily question(s) recording all entries in their math journals. Approximately 4 minutes should be used for discussion. Two days of each week are called “Fact Time” and should be devoted to developing quick recognition (recall) of basic facts or focused intervention according to student needs. Teachers should use classroom supplementary materials such as flashcards, textbook supplements, district programs, etc. based on student needs in the classroom. All spiraling reviews will be found as a separate attachment in the developer with the first unit of each six weeks.

• STATE RESOURCES

- **TEXTTEAMS: Rethinking Elementary Mathematics Part I:** Place Value Puzzles to 9,999; Expanding Numbers; and Make It Zero
- **MTC K-3:** Geometric Figures and Place Value <http://www.tea.state.tx.us/math/index.html>

- Texas population websites:
<http://www.ipl.org/div/kidspace/stateknow/skhome.html> or <http://www.census.gov/> and type in “Texas”.

Advance Preparation:

1. Card Set: **Base-ten Block Model Cards** (optional if base-ten blocks and overheads are not available). Make sets of 10 of each block for each group of students and a set of transparencies to use on the overhead.
2. Create **Large Units Place Value Mat** by replicating the **Handout: Units Place Value Mat** on two large sheets of chart paper or bulletin board paper. Include the base-ten block that signifies each place by cutting out one or more of each block card and gluing it under the value name. (1 per teacher)
3. Handout: **Units Place Value Mat** – Run on cardstock and laminate (1 per student group)
4. Transparency: **Units Place Value Mat** (1 per teacher)
5. Transparency: **Concert in the Park** (1 per teacher)
6. Card Set: **Large Digit Cards** (1 per group and 1 per teacher)
7. Handout: **Unit Place Value Representations** (1 per student)
8. Handout: **Thousands Place Value Mat** – Run on cardstock and laminate (1 per student group)
9. Create **Thousands Place Value Mat** by replicating the **Handout: Thousands Place Value Mat** on two large sheets of chart paper or bulletin board paper. Include the base-ten block that signifies each place by cutting out one or more of each block card and gluing it under the value name. (1 per teacher)
10. Transparency: **Thousands Place Value Mat** (1 per teacher)
11. Handout (optional): **Base-Ten Drawing Graphic** (1 per student as needed)
12. Transparency: **Base-Ten Model Graphic** (1 per teacher)
13. Handout (optional): **Base-Ten Model Graphic** (1 per student)
14. Handout: **More Ways** (1 per student)
15. Handout: **Multiple Representations Practice** (1 per student)
16. Transparency: **World Records** (1 per teacher)
17. Handout: **Place Value Recording Sheet** (1 per student)
18. Transparency: **Place Value Recording Sheet** (1 per teacher)
19. Handout: **World Record Place Value Practice** (1 per student)
20. Handout: **House Place Value Representation Chart** (1 per student)
21. Handout: **Populations of Texas Cities** (1 per student)

Background Information:

Students will have prior knowledge of representing whole numbers through 999 with various manipulatives (2.1A) and reading, writing, and describing whole numbers to 999 (2.1B). Grade 3 students are expected to extend the whole numbers through 999,999. The beginning of this lesson connects student’s knowledge of whole numbers through 999 and extends that knowledge through 999,999.

GETTING READY FOR INSTRUCTION SUPPLEMENTAL PLANNING DOCUMENT

Instructors are encouraged to supplement, differentiate and substitute resources, materials, and activities to address the needs of learners. The Exemplar Lessons are one approach to teaching and reaching the Performance Indicators and Specificity in the Instructional Focus Document for this unit. A Microsoft Word template for this Planning document is located at www.cscope.us/sup_plan_temp.doc. If a supplement is created electronically, users are encouraged to upload the document to their Lesson Plans as a Lesson Plan Resource for future reference.

INSTRUCTIONAL PROCEDURES

ENGAGE

- Have students sit in groups of 3-4 students and prompt each student to open his/her math journal to answer the following question:
 - What is "place value"? Write down everything you know about it.** Allow students 2-3 minutes to discuss what they have written in their journals. Then discuss as a class the meaning of place value. (See Vocabulary note)
 Next, ask:
 - What is a "digit"?** Have student's journal their answers and then discuss as before. (See Vocabulary note)
 Post these definitions in the room for students to copy into their math journals.
- Distribute bags of base-ten blocks to each group, and place one 100-flat, one 10-long, and one unit block on the overhead and prompt student groups to do the same. Ask:
 - What is the name of each of these blocks?** (100-flat, 10-long, unit) See Vocabulary note.
- Ask:
 - What is the value of each of these blocks?** (100, 10 and 1)
 - What is the value of the all these blocks together? How do you know?** (111) *Answers may vary, but should include that $100 + 10 + 1 = 111$.*
 - Are there other ways you could use base-ten blocks to represent this number? How do you know?** (Yes) *Answers may vary. It could be represented using 11 10-longs and 1 unit because the sum is still 111.*
 - By removing one block, what are some other values these blocks could represent?** (101, 110, 11)

EXPLORE/EXPLAIN 1

- Display the teacher created **Large Units Place Value Mat** on the board or wall. Distribute handout: **Units Place Value Mat** to each group of students.
- Display transparency: **Concert in the Park** on the overhead.
 - Have any of you ever been to a concert in the park?** *Answers may vary.* You might have to describe a concert in the park as people sitting on blankets or standing, and usually draws large crowds, etc.
 Have students use their handout: **Unit Place Value Mat** to model the number 999. Observe students as they represent 999 using base-ten blocks on the mat. Demonstrate the same on the overhead with the transparency base-ten blocks to build 999 using nine units, nine 10-longs, and nine 100-

Notes for Teacher

NOTE: 1 Day = 50 minutes
Suggested Day 1

SPIRALING REVIEW

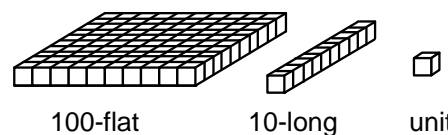
MATERIALS

- Math Journal (1 per student)
- Overhead base-ten blocks (ten 100-flats, ten 10-longs, and ten units in each set) (1 set per teacher)
- Transparency: **Base-ten Block Model Cards** (if overhead base-ten blocks are not available) (1 per teacher)
- Bags of base-ten blocks (at least ten 100-flats, ten 10-longs, and ten units in each bag) (1 bag per group)
- Card Set: **Base-ten Block Model Cards** (if base-ten blocks are not available) (1 per group) (1 per teacher)

VOCABULARY

Place value: The value of the position of the digit, such as units, tens, hundreds, etc.

Digit: Any numeral from 0-9



To ensure consistent vocabulary, base-ten blocks will be identified as a 100-flat, 10-long, and unit throughout the lessons in CSCOPE.

MATERIALS

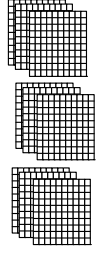


- Bags of base-ten blocks (at least ten 100-flats, ten 10-longs, and ten units in each bag) (1 bag per group)
- Large Units Place Value Mat** (1 per teacher – see Advanced Preparation)
- Handout: **Units Place Value Mat** (1 per group)
- Transparency: **Units Place Value**

INSTRUCTIONAL PROCEDURES

flats. When the groups have completed showing 999 with the base-ten blocks ask for a volunteer to build the number in digits on the **Large Units Place Value Mat** using the **Large Digit Cards**. Have student groups do the same on their group mats.

- **How many hundreds do you have? Tens? Ones?** (*9 hundreds, 9 tens, 9 ones*)
- **What does nine hundred look like as a number? Nine tens? Nine ones?** (*900, 90, 9*)
- **If we add these numbers altogether what number will we get? How do you know?** (*999*) *Answers may vary.*


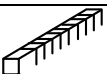
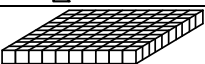

- Post the appropriate base-ten cards/large number cards on the **Large Units Place Value Mat** on the board and write the following under the mat: $900 + 90 + 9 = 999$. Example:

Units		
Hundreds	Tens	Ones
		
9	9	9

$900 + 90 + 9 = 999$

Let students know that when we write numbers like this it is called “expanded notation”. Standard form is the way the whole number is usually written.

- **How could you write the number 999 in words?** *Answers may vary, but should include saying the number and writing the words as they are said.*
 - Have students write the number 999 in word form in their journals. Ask for a volunteer to come up to the **Large Units Place Value Mat** on the board and write the word form for 999. (*Nine hundred ninety-nine*)
 - **Can 999 be modeled with 999 individual units?** (*Yes, but we do not have enough cubes to model it that way.*)
 - **Is there another way 999 could be modeled?** (*Yes, we could use 9 units and 99 10-longs.*)
- Distribute the handout: **Unit Place Value Representations** to individual students and have each record 999 pictorially, in expanded notation, in words and as a number. Demonstrate for students how to make squares for 100-flats, lines for 10-longs, and dots for units. For example, base-ten block drawings could be:

Name	Block	Drawing
Unit (small cube)		•
10-Long		
100-Flat		

Notes for Teacher

Mat (1 per teacher)

- Transparency: **Concert in the Park** (1 per teacher)
- Card Set: **Large Digit Cards** (1 per group and 1 per teacher)
- Handout: **Unit Place Value Representations** (1 per student)

VOCABULARY

Standard Form: A name of a whole number written in customary form

Expanded Notation: A way of writing numbers as a sum of each digit and its place value; also known as “expanded form”.

TEACHER NOTE

Discuss with students the correct word form for writing numbers. That is, a hyphen should be placed between numbers that label the tens place from twenty-one through ninety-nine. A hint to students might be to look at the number representing the tens place – if it ends in “-ty” and there is a digit in the ones place, then a hyphen goes in between the two number words.



MISCONCEPTION

Students may not understand how standard form and expanded notation are related. By displaying each form with base-ten blocks and the place value mat, students are better able to see the connection between the two forms.

INSTRUCTIONAL PROCEDURES

EXPLORE/EXPLAIN 2

- Have students refer to their models of 999 on their place value mats. Tell students that before the concert ended Friday night, one more person arrived.
 - How can you demonstrate on your mat what would happen if one more person attended the concert on Friday night?**

Have students add a unit base-ten block in the ones column on their **Units Place Value Mat** as you model on the overhead. With their partner, have students explore what happens to each place value when one more person attends the concert. Allow 5-10 minutes for student discussion. Once students have finished discussing, ask:

 - Did the value of any place change? Why or why not?** (Yes) *Answers may vary, but should include that each place increased.*
 - Who would like to share their thinking of how to model 999 people plus one more person?**
 - Did anyone do anything different?**

Make sure the above conversation includes the following discussion questions.

 - How many units do you have in the ones column?** (10 units)

Prompt students to exchange the “9” **Large Digit Number Card** with the “1” and “0” **Large Digit Number Cards** on the **Units Place Value Mat**.

 - Each place can only have a one-digit number and the largest one-digit number is nine. What do we have to do?** (Regroup to the tens place.)
 - Can you represent ten units in another way? Explain.** (Yes, the 10 units can be replaced with one 10-long in the tens column.)
 - If we add another 10-long to the tens place, how many tens will we have?** (10)

Model this by adding another 10-long on the overhead. Exchange the number cards on the large place value mat to show 0 ones and 10 tens. Remind the students that each place on the mat can only have a one-digit number and that the number 10 has two-digits.

 - If we have too many tens, what do we have to do?** (Regroup to make 1 one-hundred.)

Exchange the number cards on the large place value mat to show 0 tens and exchange the 9 with the 1 and 0 cards. Model this by adding another 10-long on the transparency: **Units Place Value Mat**.

 - What base-ten block is equal to ten 10-longs?** (100-flat = ten 10-longs or 100 units.)

Model placing ten 10-longs beside a 100-flat to prove the exchange on the overhead.

 - Look at your hundreds column. What do you notice?** (I have ten 100-flats.)
- Have students stack ten 100-flats to create a thousand-cube and count by hundreds ten times.
- How much is ten 100's?** (1,000)
 - What shape have you created?** (A cube) At this point, show the students a 1000-cube and let them know that this block represents one thousand.
- Exchange the number cards again on the large place value mat.
- What do you think we should do now?** *Answers may vary, but students should realize that an additional place is needed. Allow this discussion before introducing the next mat.*
- Place the **Large Thousand Place Value Mat** next to the **Large Units Place Value Mat** on the board or wall. Give each pair of students the



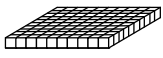
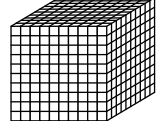
Notes for Teacher

MATERIALS

- Base-ten blocks
- Handout: **Units Place Value Mat** (1 per group)
- Transparency: **Units Place Value Mat** (1 per teacher)
- Transparency: **Concert in the Park** (1 per teacher)
- Card Set: **Large Digit Cards** (1 per group and 1 per teacher)
- Base-ten 1000-cube (at least 1 per teacher) (at least 4 per group)
- Large Thousands Place Value Mat** (1 per teacher – see Advanced Preparation)
- Handout: **Thousands Place Value Mat** (1 per group)
- Transparency: **Thousands Place Value Mat** (1 per teacher)
- Handout (optional): **Base-Ten Drawing Graphic** (1 per student as needed)
- Pipe cleaners (1 per group and 1 per teacher)
- Handout: **More Ways** (1 per student)

TEACHER NOTE

Students will need to learn a new “shorthand drawing” for “thousands”. Use the optional handout: **Base-Ten Drawing Graphic** to demonstrate:

Name	Block	Drawing
Unit (small cube)		•
10-Long		
100-Flat		□
1000-Cube (large cube)		◻

INSTRUCTIONAL PROCEDURES

handout: **Thousands Place Value Mat**, a pipe cleaner and base-ten 1000-cubes (or cut out the cubes of the **Base-ten Block Model Cards**).

4. Introduce the **Thousands Place Value Mat** by asking:
 - **How is the Thousands Place Value Mat similar to the Units Place Value Mat?** *(They both have three columns: hundreds, tens, and ones.)*
 - **How are the two mats different?** *(The name of the mats are different, one being Units and the next larger one being Thousands.)*

Place a pipe cleaner shaped like a comma between the two large wall mats. Explain that the comma is used in mathematics to help you read numbers correctly. When students see a comma, they must say the name or period of the mat. Have each pair of students place their “comma” between the two mats. Let students know that when they write the word form for thousands, they will also place a comma between the word “thousand” and the remaining number words.
5. Point out that the word “period” refers to a dot to show or indicate the end of a sentence in reading, but in mathematics, each grouping displayed on the place value mat is called a period.
6. Now that students have another mat to use, have them find out how many people went to the concert on Friday night. Continue modeling with the mats using base-ten blocks on the overhead.
 - **How many hundred-flats do we have in the hundreds place?** *(10)*
 - **What do we have to do?** *(Regroup) Exchange the cards to show 0 hundreds and 1 one-thousand.*
 - **What does your model look like on the Thousands Place Value Mat?** *(We regrouped by replacing the ten 100-flats on the Units Mat with a 1000-cube on the Thousands Mat.)*
7. **On Friday night, how many people attended the rock concert?** *(1,000).*
Point to the comma when saying the word thousand. Remind them that the 1 is in the one-thousand place and the period name is thousand.
 - **Who can summarize the steps we took to find the answer?** *(We began with 999 and added one more person or unit. We exchanged ten units for one 10-long. We exchanged ten 10-longs for one 100-flat. We exchanged ten 100-flats for one 1,000 cube.)*
 - **Why do you think our number system is called the base-ten number system?** *(Because each place is based on multiples of ten.)*
8. Distribute the handout: **More Ways** to individual students to complete with a partner. Write the number “1,146” on the board of overhead. Prompt students to use the handout to show this number two different ways. Allow students to use the place value mats at their table if needed. Debrief and discuss answers as a class if time allows.

Notes for Teacher

VOCABULARY

Period: A three-digit grouping of a number on the place value chart.

TEACHER NOTE

Some discussion may need to take place regarding the meaning of the word “period”. Students can brainstorm what they already know about the word which should lead to the mathematical use of the word.

TEACHER NOTE

If time is an issue, begin Day 2 with the handout: **More Ways**.

INSTRUCTIONAL PROCEDURES

EXPLORE/EXPLAIN 3

- Distribute place value mats and base-ten blocks from yesterday to groups of students. Prompt students to display 1,000 on the place value mats with the 1000-cube. Have the **Large Unit** and **Thousands Place Value Mat** displayed on the board.
 - If I add nine more 1000-cubes, how many 1000-cubes will I have in the one-thousands place?** (*Ten 1000-cubes.*)
Have students add nine more base-ten 1000-cubes (the cube cards should be used here) to their mat as you do the same on the large mat. Place the cube cards end-to-end to create a display showing a single rectangular prism of ten 1000-cubes. Also, change the number cards by adding a zero to make it 10.
 - What do ten 1,000-cubes put together look like? What would be the value of that structure? Explain your thinking.** *Answers may vary, but should include: Ten 1000-cubes are ten 1000-cubes long or ten 1000-cubes tall and resemble the smaller Units 10-long. If you skip count by 1,000 ten times, the value would be 10,000.*
- Refer to the 10 1000-cubes on the **Large Thousands Place Value Mat**. Explain that we could use individual 1000-cubes or we could use the ten-thousand rectangle structures (10,000-longs) to represent ten 1000-cubes.
- Discuss with students the fact that the base-ten models come in three distinct shapes: a cube; a long and a flat. Display the transparency: **Base-Ten Model Graphic** to help students better connect the base-ten models to the larger numbers through the thousands.
 - What do you notice about the multiplication number sentences?** (*They all have times 10 except for the one; the products have different numbers of zeros; The products decrease from left to right and increase from right to left.*)
- Refer to the ten 1,000-cubes on the overhead thousands place value mat.
 - What will we need to do?** (*Regroup*) Exchange the cards leaving the 0 in the one-thousand place and placing the one in the ten-thousands place. Point to the **Large Digit Cards** and the comma as the number is read aloud.
 - What would we have to add to the ten-thousands place to make us regroup to the next place?** (*9 more 10,000-longs.*) Add nine more 10,000-longs on the large mat.
 - What would ten 10,000 structures put together look like? What would be the value of that structure? Explain your thinking.**
Answers may vary, but should include; ten 10,000-longs resemble the smaller Units 100-flat. If you skip count by 10,000 ten times, the value would be 100,000.
- Refer to the hundred-thousands place on the **Large Thousands Place Value Mat** and exchange the number cards once again. Explain that the number is so large that we don't have enough base-ten blocks to build it. We would need one hundred 1000-cubes or ten 10,000-longs. Remind the students that the Large Place Value Mats will act as a visual to help them "see" the value of each place using base-ten blocks. Practice reading the number as you point to the mats and comma. Remind the students that the word "and" is not ever used when reading whole numbers.
- Allow students about 15 minutes students to work individually to complete the handout: **Multiple Representations Practice**. Debrief and discuss the handout: **Multiple Representations Practice** by having students demonstrate their understanding using the large posted place value mats and base ten materials. Students should be able to justify the need for regrouping in each place. Students should also be able to explain the effect of the regrouping on each place. Emphasize the use of correct

Notes for Teacher

Suggested Day 2

SPIRALING REVIEW

MATERIALS

- Overhead base-ten blocks (ten 100-flats, ten 10-longs, and ten units in each set) (1 set per teacher)
- Bags of base-ten blocks (at least ten 100-flats, ten 10-longs, and ten units in each bag) (1 bag per group)
- Base-ten 1000-cube (at least 1 per teacher) (at least 4 per group)
- Transparency: Large Unit Place Value Mat** (1 per teacher)
- Large Unit and Thousands Place Value Mat** (1 per teacher) (posted on board from Day 1)
- Card Set: **Base-ten Block Model Cards** (if base-ten blocks are not available) (1 per group) (1 per teacher) (from Day 1)
- Transparency: **Base-Ten Model Graphic** (1 per teacher)
- Handout (optional): **Base-Ten Model Graphic** (1 per student)
- Handout: **Multiple Representations Practice** (1 per student)

TEACHER NOTE

When introducing the thousands period, using the additional **Base-Ten Model Graphic** may help students understand the patterns inherent in using base-ten blocks to show place value. The pattern shows that the same three places are repeated in each period: hundreds, tens and ones.



MISCONCEPTION

Students may use the word "and" when reading and writing whole numbers. Let students know that the word "and" is not used in naming whole numbers. Allow students sufficient time to practice reading whole numbers, and encourage them to pause at the commas in the whole numbers.



MISCONCEPTION

Students may have difficulty reading six digit numbers. It may be necessary to reinforce the purpose of the comma,

INSTRUCTIONAL PROCEDURES

mathematical language.

- Many students may show the expanded notation of the number as: $200,000 + 30,000 + 0,000 + 800 + 00 + 1$. Explain that although the zero holds the place on the place value chart and will be used when the value of each digit is written, it is not necessary to write it in expanded notation. Nor is the zero used when writing the number in written form, i.e. two hundred thirty thousand, zero thousands, eight hundred, zero tens, one.

EXPLAIN/EXPLORE 4

- Distribute place value mats and base-ten blocks from yesterday to groups of students. Each student should also receive the handout: **Place Value Recording Sheet**. Explain that today we are going to practice reading and writing large numbers using actual world records. Display the transparency: **World Records** using the overhead.
 - How many family members participated in the locomotion dance?** (1,752)
- Prompt students to use their base-ten blocks to create this number. Allow students to use a **Unit Place Value Mat and a Thousands Place Value Mat**. Use the **Large Digit Cards** as well to build the number on the **Large Place Value Mats**.
- Display the transparency: **Place Value Recording Sheet** on the overhead. Write the number 1,752 in standard form on the first blank line above the place value chart and have students do the same. Remind them to always label the numbers. Explain that the recording sheet includes the two place value mats: the Thousands and the Units.
- Use the overhead to model writing the number on the first and second rows of the chart.
 - Why is the position of the digit within a number important?**
Answers may vary, but should include that it tells the value of the digit.
 - What happens to the value of the digit the farther left it is placed?**
(The farther to the left the digit is placed, the greater its value.)
 - How many ones are there?** (2)
Write a 2 in the ones place of the place value chart.
 - What is the value of the 2?** (2 ones or 2)
 - How many tens are there?** (5)
Write a 5 in the tens place of the place value chart.
 - What is the value of the 5?** (5 tens or 50)
 - How many hundreds are there?** (7)
Write a 7 in the hundreds place of the place value chart.
 - What is the value of the 7?** (7 hundreds or 700)
 - How many thousands are there?** (1)
Write a 1 on the thousands place of the place value chart.
 - What is the value of the 1?** (1 thousand or 1,000)

Demonstrate on the **Place Value Recording Sheet** how to record the value of each digit. Have students complete the same on their charts. Model reading the numbers aloud as you write the value of each digit on the transparency.
- Explain that the next line of the chart is for the written form of the number using words. Prompt the students to complete the chart as you model on the overhead. Remind the students not to use the word "and" when writing whole numbers in written form.

Notes for Teacher

and that the comma indicates when to name the period (ex. thousands) Have these students read the numbers one period at a time.

TEACHER NOTE

When a number has one or more zero digits, students may incorrectly translate between standard, expanded and word form. For example: 2,400 may be written as two thousand, four or as $2000 + 4$.

Suggested Day 3

SPIRALING REVIEW

MATERIALS

- Overhead base-ten blocks (ten 100-flats, ten 10-longs, and ten units in each set) (1 set per teacher)
- Bags of base-ten blocks (at least ten 100-flats, ten 10-longs, and ten units in each bag) (1 bag per group)
- Base-ten 1000-cube (at least 1 per teacher) (at least 4 per group)
- Handout: **Units Place Value Mat** (1 per group)
- Handout: **Thousands Place Value Mat** (1 per group)
- Handout: **Place Value Recording Sheet** (1 per student)
- Transparency: **World Records** (1 per teacher)
- Large Place Value Mats** (1 per teacher) (posted on board from Day 1)
- Card Set: **Base-ten Block Model Cards** (if base-ten blocks are not available) (1 per group) (1 per teacher) (from Day 1)
- Transparency: **Place Value Recording Sheet** (1 per teacher)
- Handout: **World Record Place Value Practice** (1 per student)
- Math Journal

TEACHER NOTE

You may want to demonstrate the locomotion dance by having several students make a line and put their hands on the waist of the person in front of them and move around the room.

INSTRUCTIONAL PROCEDURES

6. Display and read the next two world records on the transparency: **World Records**.
7. Explain that they are to complete the next two charts on their recording sheets using the two numbers in bold. 15,586 pound of meat and 171,000 kilograms. Students may work with a partner or individually.
8. As the students work, walk around the room and listen to student conversation. Ask students to justify their work such as:
 - **Why did you put 8 in this place?**
 - **What does the 8 represent?**
 - **What is the value of the 8 tens? etc.**
9. When all students have completed the charts, have them compare their work with their group.
 - **Who would like to complete the chart on the overhead?**
 - **Does everyone agree? Why or Why not?**
10. Have students take out their math journals and write the number "320,456" on the board or overhead. Prompt students to write this same number in their math journals. Have them use their journals to answer the following question:
 - **Why do you need a zero in the ten thousands place for this number?** *Answers may vary, but should include that the zero is a placeholder and stands for 0 thousands. Without it, you cannot distinguish between 320,456 and 32,456.*
 Debrief and discuss answers as a class.
11. Assign the handout: **World Record Place Value Practice** to individual students to complete for homework.

ELABORATE

1. Debrief and discuss homework handout: **World Record Place Value Practice** as a class.
2. Display a **unit** on the overhead. Explain to the students that today the unit block is worth one dollar.
 - **What are some of the different ways I can write one dollar?** (\$1.00 or \$1 or 100¢)
 Record student responses on the board or overhead.
3. Display a 10-long next to a unit on the overhead.
 - **If a unit is worth one dollar, how much is a 10-long worth? How do you know?**
Answers may vary, but should include that since there are ten units in one 10-long, then the 10-long would be worth 10 dollars.
 - **What are some of the different ways I can write 10 dollars?** (\$10.00)
 Record student responses on the board or overhead.
4. Display a 100-flat on the overhead.
 - **If a unit is worth one dollar and a 10-long is worth ten dollars, how much do you think a 100-flat is worth? How do you know?**
Answers may vary, but should include that since there are 100 units in a 100-flat, then the 100-flat would be worth \$100 dollars or \$100.00.
 - **What are some of the different ways I can write 100 dollars?** (\$100.00, \$100)
 Record student responses on the board or overhead.
 - **If we continue assigning money values to each base-ten block, what would be the value of the 1,000-cube? How do you know?** (\$1000) *Answers may vary, but should include that a 1000-cube contains 1000 unit cubes which each represent \$1.*
 - **What would be the value of the ten-thousand place? Hundred-thousand place?** (\$10,000 and \$100,000)
5. Distribute storage bags of base-ten blocks to each group. Explain to the

Notes for Teacher



MISCONCEPTION

Students may write only the digit itself when asked for the value of the digit. For example, when given the number 2,143 as asked to write the value of the underlined digit, students may write just the digit "2" and not 2,000. Emphasize to these students that the place of the digit determines its value.



MISCONCEPTION

When a number has one or more zero digits, students may incorrectly translate between standard, expanded and word form. For example: 2,400 may be written as two thousand, four or as 2000 + 4.

Suggested Day 4

SPIRALING REVIEW

MATERIALS

- Overhead base-ten blocks (ten 100-flats, ten 10-longs, and ten units in each set) (1 set per teacher)
- Bags of base-ten blocks (at least four 1000-cubes, ten 100-flats, ten 10-longs, and ten units in each bag) (1 bag per group)
- **Large Unit Place Value Mat** (1 per teacher)
- Handout: **Units Place Value Mat** (1 per group)
- Transparency: **Units Place Value Mat** (1 per teacher)
- **Large Thousands Place Value Mat** (1 per teacher)
- Handout: **Thousands Place Value Mat** (1 per group)
- Transparency: **Thousands Place Value Mat** (1 per teacher)
- Handout: **House Place Value Representation Chart**

TEACHER NOTE

If not enough 1000-cubes are available for student groups to have at least 1 or 2 per group, have the students use the

INSTRUCTIONAL PROCEDURES

- students that they will be utilizing the bag of base-ten blocks to create a house. The students may use the entire amount of base-ten blocks found within the bag or select the ones they choose to use to create their house. However, each group must use at least 1 thousand-cube to create their house. Students will be given 3-5 minutes to design a house with the base-ten blocks.
- When time is up, have the students observe each group's houses.
 - If each block is worth the amounts of money we assigned earlier, what do you think your house is worth? Is your house worth more or less than another group's house?** *Answers may vary, but could include that the taller houses are worth more than the smaller houses. (or) We used a lot of blocks so our house is going to be worth a lot of money.*
 - Instruct students to break apart their houses and place the 1000-cubes, 100-flats, 10-longs, and units in the appropriate sections on their group **Place Value Mat**.
 - If a unit is worth one dollar, a 10-long is worth ten dollars, a 100-flat is worth one hundred dollars, and a 1000-cube is worth one thousand dollars, what is the value of your house?** *Answers may vary.*
 - How could you show the value of your house?** *Answers may vary. Model the appropriate way to record the value of the house. Caution them to not use the word "and" (See Teacher Note).*
 - Select a group with a house that does not have any 10-longs or 100-flats and ask for a volunteer to explain how they arrived at the value of their house. Discuss with the class the importance of the zero as a place holder similar to "saving a place" in line. If all groups used all types of base-ten blocks, use a group's house value and change one of the digits to a zero and then continue the class discussion.
 - Distribute the handout: **House Place Value Representation Chart** to each student and display the transparency of the same chart on the overhead. Explain to the students that they will use the dollar value of their group house to record the standard form of that same number and all its representations. Remind students to use the "shorthand" base-ten drawings when creating the pictorial representation. Monitor students as they work. Debrief and discuss answers as a class.

EVALUATION

- Distribute the handout: **Populations of Texas Cities** to each student. Tell students they will go on a scavenger hunt using the computer to look up the populations of Texas cities. The requirement is to find city populations that range from 9,999 to 999,999 and record them on the chart. They must find five cities within the given range.
- As students find five cities with populations that match the requirements, they will write them on the handout: **Populations of Texas Cities. Have students complete the chart for each city found by recording the population in: standard form, place value, expanded notation, and word form. (See SAMPLE KEY)**
- If time allows, have students share their findings with the class. In the discussion, children will practice reading the numbers aloud using appropriate mathematical language.

Notes for Teacher

base-ten cards to design a house.

TEACHER NOTE

At this point in the lesson students tend to think that the taller houses or the houses that used the most blocks are worth more money. Accept these answers at this point in time in the lesson.

TEACHER NOTE

Students may have difficulty with the appropriate use of the word "and." In the reading of multi-digit numbers the word "and" should not be used (i.e. 234 is read two hundred thirty-four without the "and"); however, the "and" is used in the representation of money to communicate the decimal point (i.e. \$2.34 is read two dollars "and" thirty-four cents).



STATE RESOURCES

TEXTEAMS: Rethinking Elementary Mathematics Part I

Place Value Puzzles to 9,999; Expanding Numbers; and Make It Zero

MTC K-3: Geometric Figures and Place Value may be used to reinforce these concepts.

Suggested Day 5

SPIRALING REVIEW

MATERIALS

- Handout: **Populations of Texas Cities**

RESOURCES

Use Texas Population websites. See **TEACHER NOTE** below.

INSTRUCTIONAL PROCEDURES

Notes for Teacher

TEACHER NOTE

If computers are not available for the students, this population list can be placed on the board or overhead:

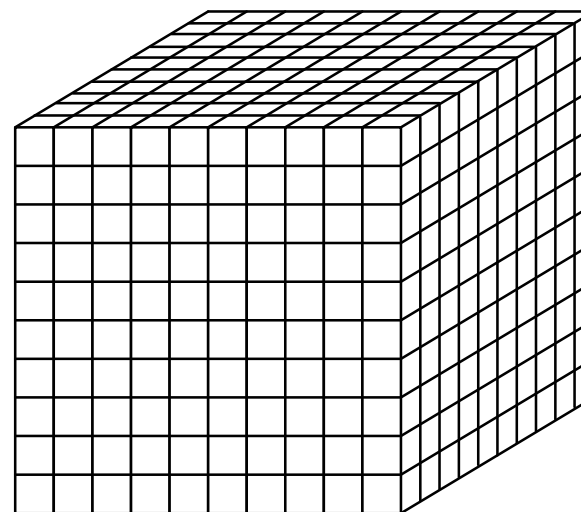
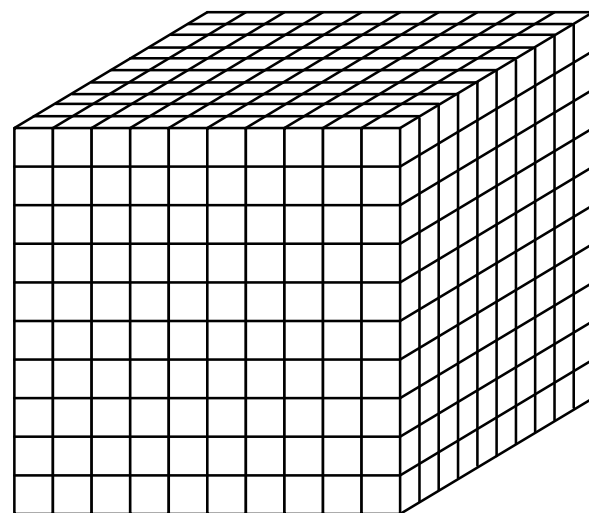
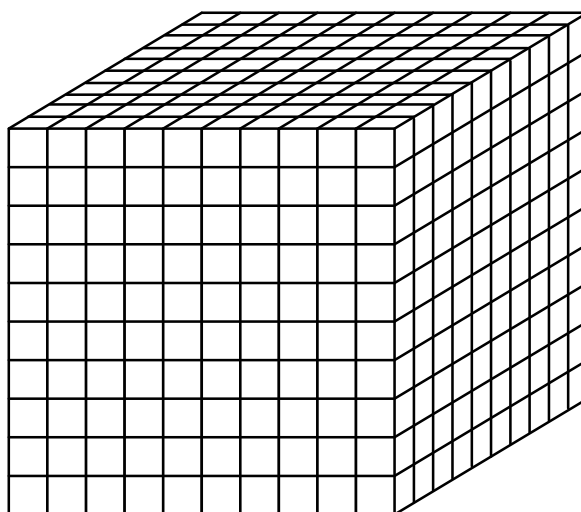
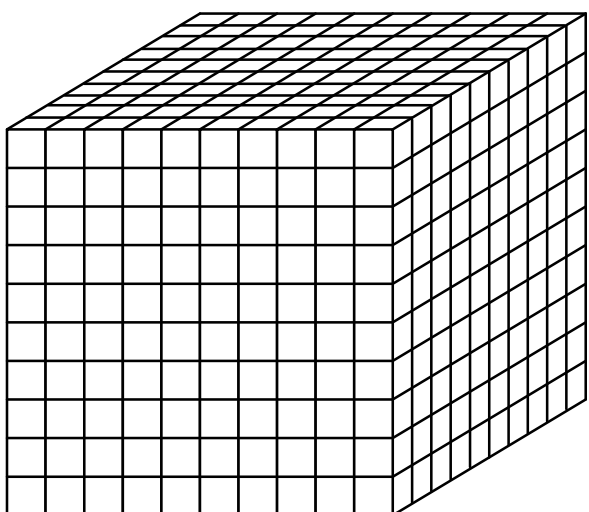
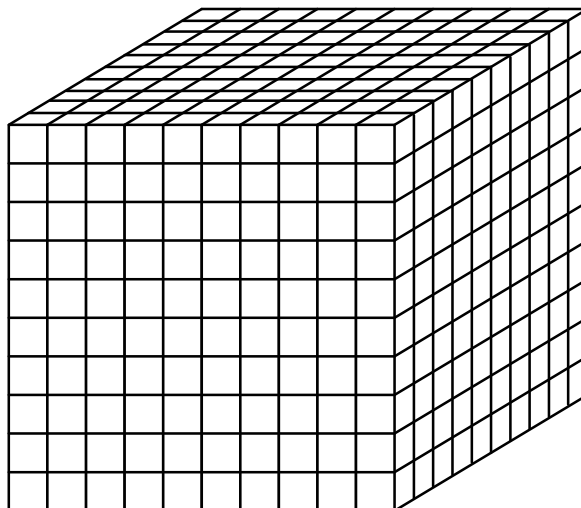
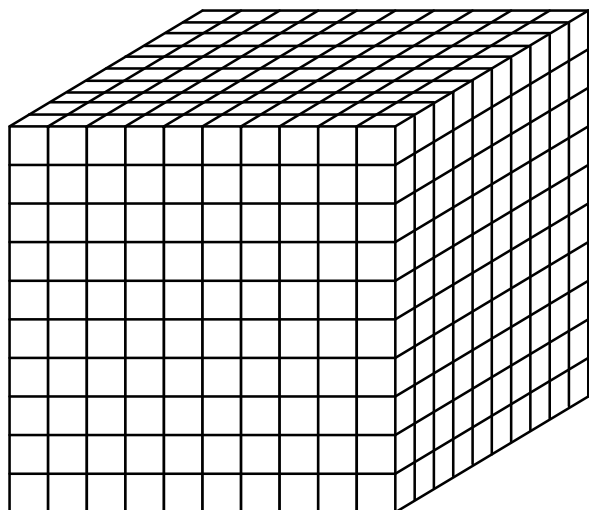
Amarillo	173,627
Aransas Pass	8,138
Austin	656,562
Bastrop	5,340
Bellaire	15,642
Canyon Lake	16,870
Del Rio	33,867
Harlingen	57,564
Marshall	23,935
Plano	222,030



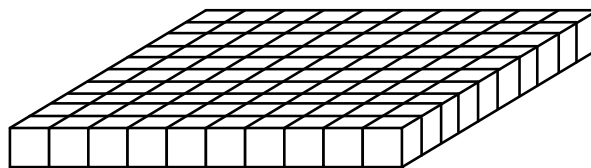
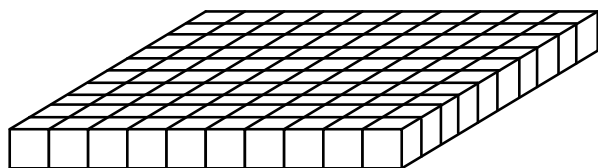
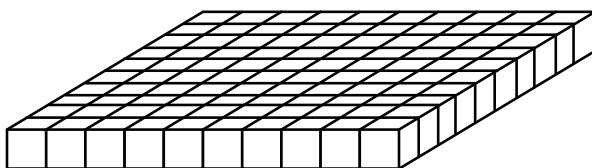
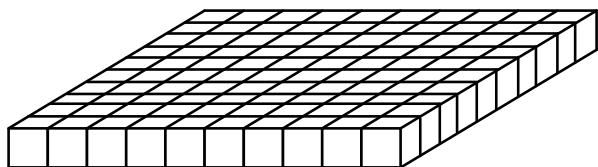
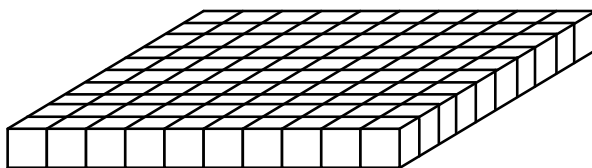
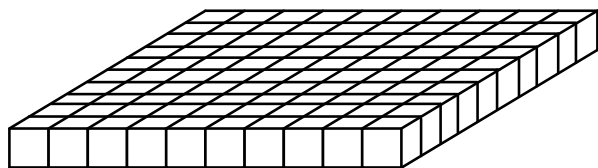
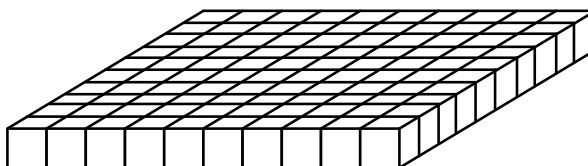
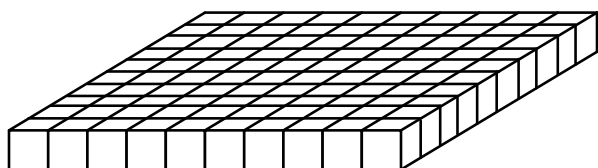
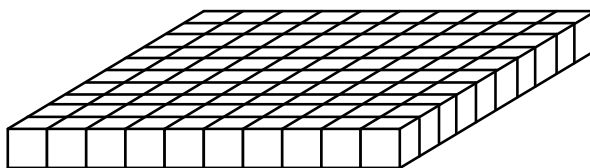
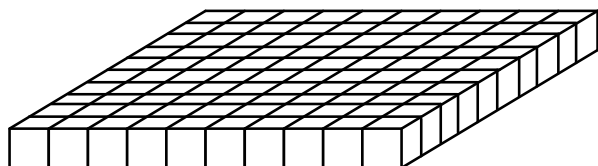
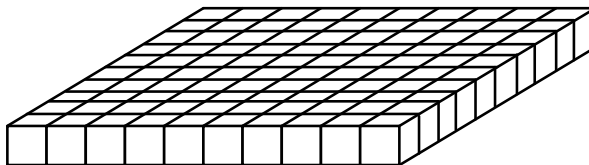
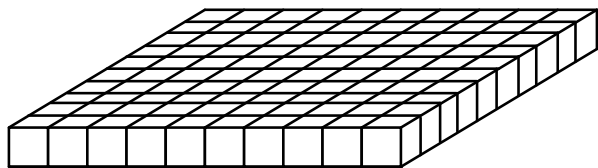
TAKS CONNECTION

TAKS Release 2003 Question #2
TAKS Release 2004 Question #33
TAKS Release 2006 Question #2
SDAA 2005 Question #17



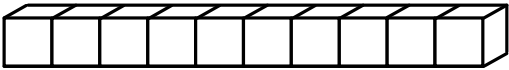
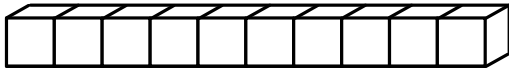
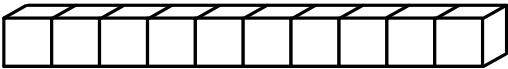

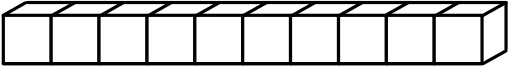
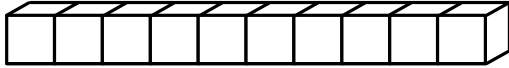
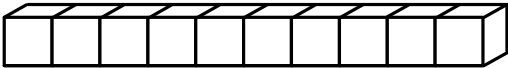
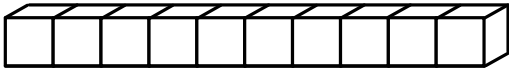
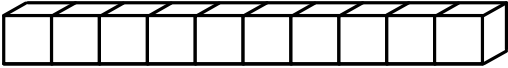
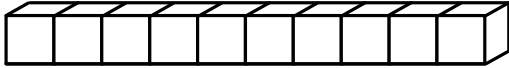
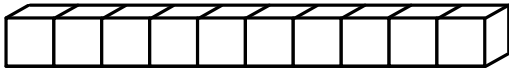
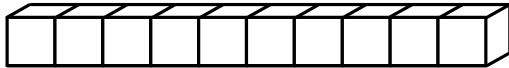
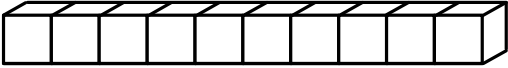
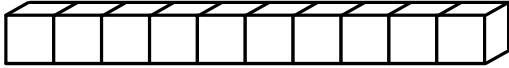
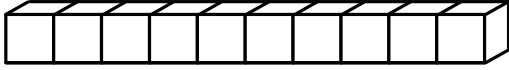

Base Ten Block Model Cards (pp. 1 of 4)



Base Ten Block Model Cards (pp. 2 of 4)



Base Ten Block Model Cards (pp. 3 of 4)

Base Ten Block Model Cards (pp. 4 of 4)



UNITS

Hundreds

Tens

Ones

Concert in the Park



**At the beginning of the
concert last Friday night,
there were 999 people
in the park.**

Large Digit Cards (pp. 1 of 4)



0

0

0

0

0

0

0

0

9

9

9

9

Large Digit Cards (pp. 2 of 4)



9

9

9

9

1

1

1

1

2

2

2

2

Large Digit Cards (pp. 3 of 4)



3

3

3

3

4

4

4

4

5

5

5

5

Large Digit Cards (pp. 4 of 4)



6

6

6

6

7

7

7

7

8

8

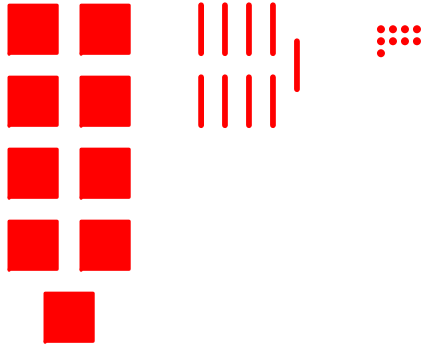
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8

Unit Place Value Representations **KEY**

Standard Form: 999

Pictorial



Place Value

<i>Hundreds</i>	<i>Tens</i>	<i>Ones</i>
<i>9</i>	<i>9</i>	<i>9</i>

Expanded Notation

$$900 + 90 + 9 = 999$$

Word Form

Nine hundred ninety-nine

Unit Place Value Representations

Standard Form:	
Pictorial	Place Value
Expanded Notation	Word Form

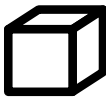

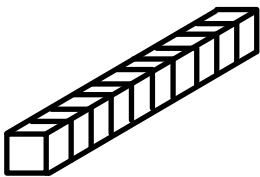

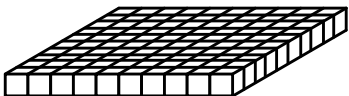

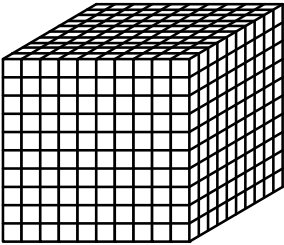

THOUSANDS

Hundreds


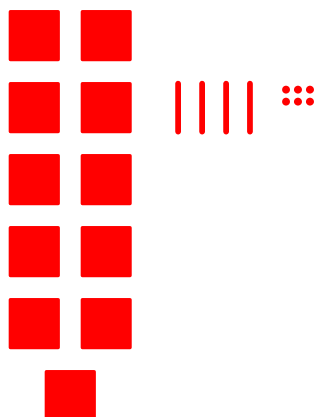
Tens

Ones

Base-Ten Drawing Graphic

Name	Block	Drawing
Unit (small cube)		
10-Long		
100-Flat		
1000 (large cube)		

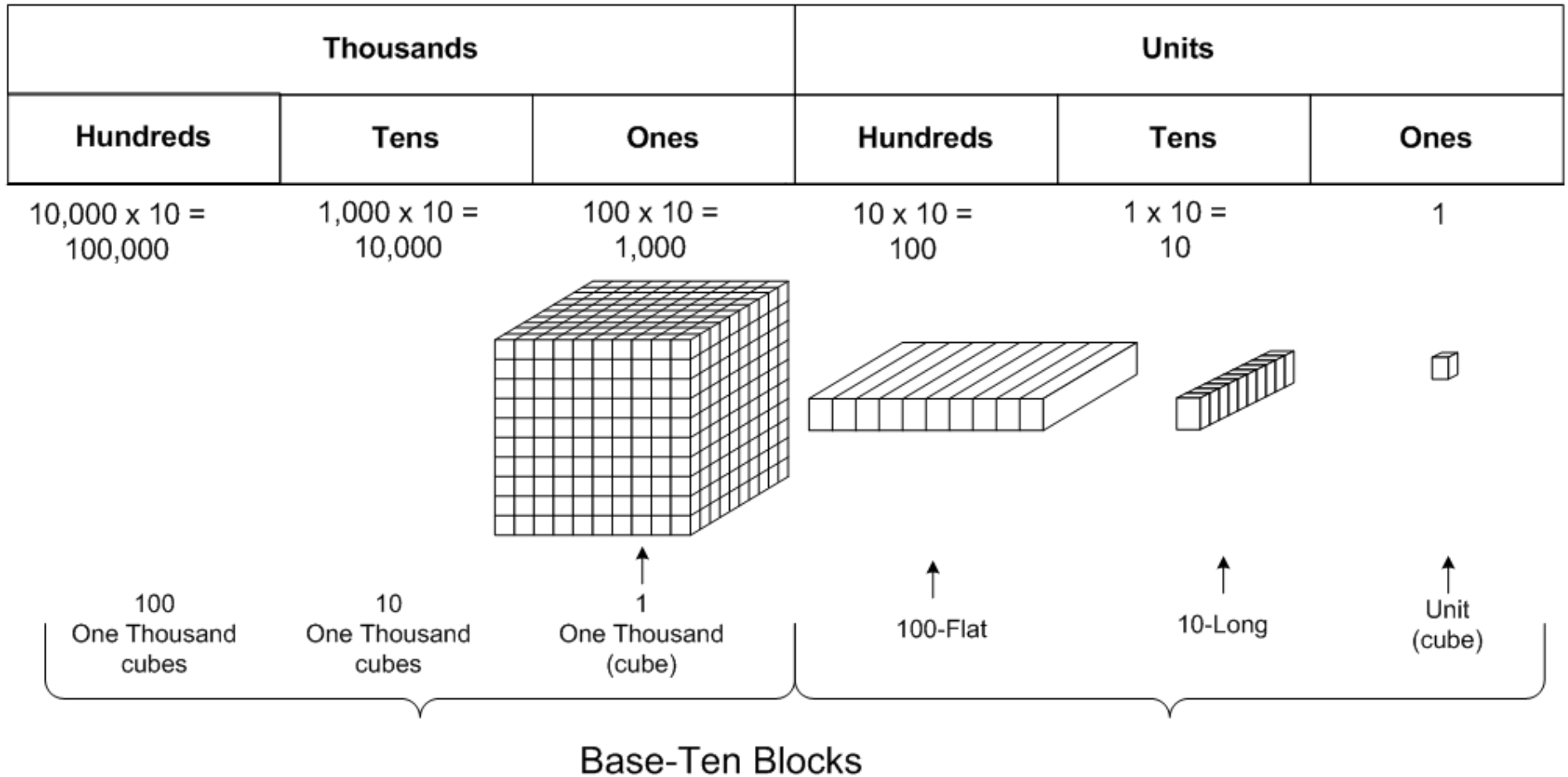
More Ways **KEY**

Standard Form: 1146																																					
<div>Pictorial (One Way)</div> <div></div> <div>Pictorial answers may vary.</div>	<div>Pictorial (Another Way)</div> <div></div> <div>Pictorial answers may vary.</div>																																				
<div>Place Value</div> <table><tr><th colspan="3">Thousands</th><th colspan="3">Units</th></tr><tr><th>Hundreds</th><th>Tens</th><th>Ones</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td>1</td><td>1</td><td>4</td><td>6</td></tr></table>	Thousands			Units			Hundreds	Tens	Ones	Hundreds	Tens	Ones			1	1	4	6	<div>Place Value</div> <table><tr><th colspan="3">Thousands</th><th colspan="3">Units</th></tr><tr><th>Hundreds</th><th>Tens</th><th>Ones</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td>1</td><td>1</td><td>4</td><td>6</td></tr></table>	Thousands			Units			Hundreds	Tens	Ones	Hundreds	Tens	Ones			1	1	4	6
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<div>Expanded Notation</div> <div>1000 + 100 + 40 + 6 = 1,146</div>	<div>Expanded Notation</div> <div>1000 + 100 + 40 + 6 = 1,146</div>																																				
<div>Word Form</div> <div>One thousand, one hundred forty-six</div>	<div>Word Form</div> <div>One thousand, one hundred forty-six</div>																																				
<div>Why can you use different combinations of base-ten blocks to show the same number?</div> <div>Answers may vary, but should include that smaller units can be used to represent the larger units.</div>																																					

More Ways

Standard Form: 1146																																									
Pictorial (One Way)			Pictorial (Another Way)																																						
Place Value <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="3">Thousands</th> <th colspan="3">Units</th> </tr> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td style="height: 30px;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Thousands			Units			Hundreds	Tens	Ones	Hundreds	Tens	Ones							Place Value <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="3">Thousands</th> <th colspan="3">Units</th> </tr> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td style="height: 30px;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Thousands			Units			Hundreds	Tens	Ones	Hundreds	Tens	Ones						
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Expanded Notation			Expanded Notation																																						
Word Form			Word Form																																						
Why can you use different combinations of base-ten blocks to show the same number?																																									

Base-Ten Model Graphic



Multiple Representations Practice **KEY**

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place	1	13	0	,	7	9	11
Number After Regrouping Each Place	2	3	0	,	8	0	1

- What is the value of the ten-thousands place?

30,000

- What is the value of the hundreds place?

800

- What is the value of the hundred-thousands place?

200,000

- What is the value of the ones place?

1

- What is the value of the one-thousands place?

0 thousands

Use the chart below to represent the number multiple ways.

Expanded Notation	Word Form	Standard Form
$200,000 + 30,000 + 800 + 1$	<i>Two hundred thirty thousand, eight hundred one</i>	<i>230,801</i>

Multiple Representations Practice

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place	1	13	0	,	7	9	11
Number After Regrouping Each Place							

- What is the value of the ten-thousands place?
- What is the value of the ones place?
- What is the value of the hundreds place?
- What is the value of the one-thousands place?
- What is the value of the hundred-thousands place?

Use the chart below to represent the number multiple ways.

Expanded Notation	Word Form	Standard Form

World Records

WAVE FOR WALES: 2007



In Margam Country Park in South Wales:

- Four generations of one family, which was made up of **1,752 people**, took part in the world's biggest locomotion dance.



MOST SLICES OF MEAT CUT IN ONE HOUR

Valladolid, Spain:

- Diego Hernandez sliced 1,660 slices of meat in 60 minutes. The total weight of the meat was **15,586 pounds**.



LARGEST BLUE WHALE

- The largest whale ever measured was a female weighing **171,000 kilograms** and measuring over 90 feet.

PLACE VALUE RECORDING SHEET **KEY**

Standard Form: 1, 752 people

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place			1	,	7	5	2
Value of Each Digit			1,000		700	50	2
Word Form	One thousand, seven hundred fifty-two people						

Standard Form: 15,586 pounds

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place		1	5	,	5	8	6
Value of Each Digit		10,000	5,000		500	80	6
Word Form	Fifteen thousand, five hundred eighty-six pounds						

Standard Form: 171,000 kilograms

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place	1	7	1	,	0	0	0
Value of Each Digit	100,000	70,000	1,000		0	0	0
Word Form	One hundred seventy-one thousand kilograms						

PLACE VALUE RECORDING SHEET

Standard Form: _____

	THOUSANDS			UNITS		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Number in Each Place						
Value of Each Digit						
Word Form						

Standard Form: _____

	THOUSANDS			UNITS		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Number in Each Place						
Value of Each Digit						
Word Form						

Standard Form: _____

	THOUSANDS			UNITS		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Number in Each Place						
Value of Each Digit						
Word Form						

World Record Place Value Practice **KEY**

For each world record written in standard form in the chart below, write the letter of the best matching representation (expanded notation or word form).

World Records in Standard Form

(1) C The largest swimming pool in the world is 1,013 meters long.	(4) B The largest ball-point pen collection in the world: 220,000.
(2) D Largest number of students in a school: 32,114.	(5) A The largest pizza order on record is: 13,500.
(3) E The largest collection of key chains: 41,418.	(6) F The world's longest train trip is 6,135 miles long.

Expanded Notation or Standard Form

(A) $10,000 + 3,000 + 500$	(D) Thirty-two thousand, one hundred fourteen
(B) Two hundred twenty thousand	(E) $40,000 + 1,000 + 400 + 10 + 8$
(C) $1,000 + 10 + 3$	(F) Six thousand, one hundred thirty-five

(7) Explain how you determined which world record matched which expanded notation or word form.

Answers may vary.

(8) Create a new world record of your choice. Describe the world record and use a 5-digit or 6-digit number to write your record in standard form, expanded notation, and word form.

Answers may vary.

World Record Place Value Practice

For each world record written in standard form in the chart below, write the letter of the best matching representation (expanded notation or word form).

World Records in Standard Form

(1) _____ The largest swimming pool in the world is 1,013 meters long.	(4) _____ The largest ball-point pen collection in the world: 220,000.
(2) _____ Largest number of students in a school: 32,114.	(5) _____ The largest pizza order on record is: 13,500.
(3) _____ The largest collection of key chains: 41,418.	(6) _____ The world's longest train trip is 6,135 miles long.

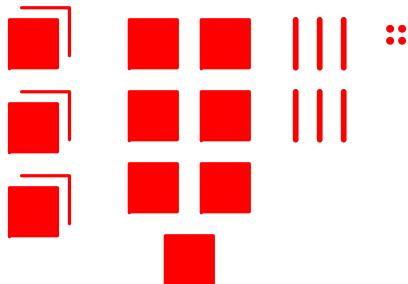
Expanded Notation or Standard Form

(A) $10,000 + 3,000 + 500$	(D) Thirty-two thousand, one hundred fourteen
(B) Two hundred twenty thousand	(E) $40,000 + 1,000 + 400 + 10 + 8$
(C) $1,000 + 10 + 3$	(F) Six thousand, one hundred thirty-five

(7) Explain how you determined which world record matched which expanded notation or word form.

(8) Create a new world record of your choice. Describe the world record and use a 5-digit or 6-digit number to write your record in standard form, expanded notation, and word form.

House Place Value Representation Chart **SAMPLE KEY**

Dollar Value: \$3,764	Standard Form: \$3,764																		
Pictorial 	Place Value <table><tr><th colspan="3">Thousands</th><th colspan="3">Units</th></tr><tr><th>Hundreds</th><th>Tens</th><th>Ones</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td>3</td><td>7</td><td>6</td><td>4</td></tr></table>	Thousands			Units			Hundreds	Tens	Ones	Hundreds	Tens	Ones			3	7	6	4
Thousands			Units																
Hundreds	Tens	Ones	Hundreds	Tens	Ones														
		3	7	6	4														
Expanded Notation $\\$3,000 + \\$700 + \\$60 + \\$4 = \\$3,764$	Word Form <i>Three thousand, seven hundred sixty-four dollars</i>																		

House Place Value Representation Chart

Dollar Value:	Standard Form:																		
Pictorial	Place Value <table border="1"> <tr> <th colspan="3">Thousands</th> <th colspan="3">Units</th> </tr> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Thousands			Units			Hundreds	Tens	Ones	Hundreds	Tens	Ones						
Thousands			Units																
Hundreds	Tens	Ones	Hundreds	Tens	Ones														
Expanded Notation	Word Form																		

POPULATIONS OF TEXAS CITIES (pp. 1 of 3) **SAMPLE KEY**

Name of City	Population
1. Amarillo	173,627
2. Austin	656,562
3. Canyon Lake	16,870
4. Harlingen	57,564
5. Plano	222,030

(1) Name of City: **Amarillo**

Population in Standard Form: **173,627**

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place	1	7	3	,	6	2	7
Value of Each Digit	100,000	70,000	3,000		600	20	7
Expanded Notation	$100,000 + 70,000 + 3,000 + 600 + 20 + 7$						
Word Form	One hundred seventy-three thousand, six hundred twenty-seven						

(2) Name of City: **Austin**

Population in Standard Form: **656,562**

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place	6	5	6	,	5	6	2
Value of Each Digit	600,000	50,000	6,000		500	60	2
Expanded Notation	$600,000 + 50,000 + 6,000 + 500 + 60 + 2$						
Word Form	Six hundred fifty-six thousand, five hundred sixty-two						

POPULATIONS OF TEXAS CITIES (pp. 2 of 3) **SAMPLE KEY**

(3) Name of City: **Canyon Lake**

Population in Standard Form: **16,870**

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place		1	6	,	8	7	0
Value of Each Digit		10,000	6,000		800	70	0
Expanded Notation	$10,000 + 6,000 + 800 + 70$						
Word Form	<i>Sixteen thousand, eight hundred seventy</i>						

(4) Name of City: **Harlingen**

Population in Standard Form: **57,564**

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place		5	7	,	5	6	4
Value of Each Digit		50,000	7,000		500	60	4
Expanded Notation	$50,000 + 7,000 + 500 + 60 + 4$						
Word Form	<i>Fifty-seven thousand, five hundred sixty-four</i>						

POPULATIONS OF TEXAS CITIES (pp. 3 of 3) **SAMPLE KEY**

(5) Name of City: **Plano**

Population in Standard Form: **222,030**

	THOUSANDS				UNITS		
	Hundreds	Tens	Ones		Hundreds	Tens	Ones
Number in Each Place	2	2	2	,	0	3	0
Value of Each Digit	200,000	20,000	2,000		0	30	0
Expanded Notation	$200,000 + 20,000 + 2,000 + 30$						
Word Form	Two hundred twenty-two thousand, thirty						

(1) Explain how you found the value of each digit in your city population numbers.

Answers may vary, but should include the use of a place value chart to determine the values of the digit, or by writing the number in expanded notation.

(2) Explain how a zero is used in standard form, expanded notation, and word form.

Answers may vary, but should include that the zero is a placeholder in standard form; is generally not written in expanded notation; and the word “zero” is not used in word form when naming a number larger than zero.

POPULATIONS OF TEXAS CITIES (pp. 1 of 3)

Name of City	Population
1.	
2.	
3.	
4.	
5.	

(1) Name of City: _____

Population in Standard Form: _____

	THOUSANDS			UNITS		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Number in Each Place						
Value of Each Digit						
Expanded Notation						
Word Form						

(2) Name of City: _____

Population in Standard Form: _____

	THOUSANDS			UNITS		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Number in Each Place						
Value of Each Digit						
Expanded Notation						
Word Form						

POPULATIONS OF TEXAS CITIES (pp. 2 of 3)

(3) Name of City: _____

Population in Standard Form: _____

	THOUSANDS			UNITS		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Number in Each Place						
Value of Each Digit						
Expanded Notation						
Word Form						

(4) Name of City: _____

Population in Standard Form: _____

	THOUSANDS			UNITS		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Number in Each Place						
Value of Each Digit						
Expanded Notation						
Word Form						

POPULATIONS OF TEXAS CITIES (pp. 3 of 3)

(5) Name of City: _____

Population in Standard Form: _____

	THOUSANDS			UNITS		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Number in Each Place						
Value of Each Digit						
Expanded Notation						
Word Form						

(1) Explain how you found the value of each digit in your city population numbers.

(2) Explain how a zero is used in standard form, expanded notation, and word form.

Bibliography

- National Council of Teachers of Mathematics. (2006). *Curriculum focal points for prekindergarten through grade 8 mathematics*. Reston, VA: National Council of Teachers of Mathematics, Inc.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: National Council of Teachers of Mathematics, Inc.