

Playing the Cards of Place Value

Brief Overview:

Students will use different manipulatives to investigate place value through 99,999. The activities have the students identify place value through the ten thousands and discuss the value of each digit in a number. In addition, students will identify the three forms of a number and comparing two numbers using $<$, $>$, or $=$. The students will complete the activities in a whole group, partner or individual settings.

NCTM Content Standard/National Science Education Standard:

Numbers and Operations:

Understand numbers, ways of representing numbers, relationships among numbers, and number systems

- understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals
- recognize equivalent representations for the same number and generate them by decomposing and composing numbers

Reasoning and Proof:

- recognize reasoning and proof as fundamental aspects of mathematics

Grade/Level:

3rd Grade

Duration/Length:

3-4 days for about 50-60 minutes; 1 day is used for assessment

Student Outcomes:

Students will be able to:

- identify the place value of numbers through 99,999 and explain the value of each place
- represent numbers in standard, word, and expanded form
- compare numbers through 99,999 using $>$, $<$, or $=$.

Materials and Resources:

Lesson 1

For Each Student or Pair of Students:

- White board, marker, and eraser, or another form of student response

- Base ten blocks
- Place Value Mat (Student Resource 1)
- Mystery Number (Student Resource 2)

For Teacher:

- One set of base ten blocks
- One brown paper bag
- One set of overhead base ten blocks
- Observation Checklist (Teacher Resource 1)
- Mystery Number Answer Key (Teacher Resource 2)
- Chart paper

Optional for Differentiation:

- Dice
- Place Value Mat (Student Resource 1)
- Create Your Own Mystery (Student Resource 3)

Lesson 2

For Each Student or Pair of Students:

- Pre-cut square for the Place Value Tent
- Scissors
- Glue
- White board, marker, and eraser
- 4 x 6 index card

For Teacher:

- Place Value Tent (Teacher Resource 3)
Adapted from the “Big Book of Math” by Dinah Zike
- Bag with Place Value War cards (Teacher Resource 4)
- Observation Checklist (Teacher Resource 1)

Optional for Differentiation:

- Chart paper and marker
- <http://nlbm.usu.edu>
- <http://gamequarium.com/placevalue.html>

Lesson 3

For Each Student or Pair of Students:

- Deck of cards
- Comparing Numbers (Student Resource 4)
- Greater Than? (Student Resource 5)
- Bag with Greater Than? set of cards (Teacher Resource 6)

For Teacher:

- Construction Paper with numbers written on them

- Place Value Game Board (Teacher Resource 5)
- Bag with Greater Than? set of cards (Teacher Resource 6)
- Observation Checklist (Teacher Resource 1)

Optional for Differentiation:

- Rope or string
- 4 x 6 index cards

Summative Assessment:

- Assessment (Student Resource 6)
- Answer Key (Teacher Resource 7)

Development/Procedures:

Lesson 1

Pre-Assessment

- Write 2,537 on the chalkboard. Have students copy the number in their math notebook.
- Say: “Underline the number in the hundreds place.
- Draw a circle around the number in the ones place.
- Draw a star under the number in the tens place.
- Draw a triangle around the number in the thousands place.”
- Say: “Who can come to the board and underline the number in the hundreds place?” *Answer: 5* “What is the value of the 5?” (Explain the value of each number if the student has difficulty) *Answer: 500*
- Say: “Who can come to the board and circle the number in the ones place?” *Answer: 7* “What is the value of the 7?” *Answer: 7*
- Say: “Who can come to the board and put a star under the number in the tens place?” *Answer: 3* “What is the value of the 3?” *Answer: 30*
- Say: “Who can come to the board and draw a triangle around the number in the thousands place?” *Answer: 2* “What is the value of the 2?” *Answer: 2,000*

Launch

- Play “Guess My Number” game. Put 1 flat, 4 longs, and 6 units in a brown paper bag. (Game adapted from “The Super Source – Base Ten Blocks”)
- Show the students the bag and give them the following clues to guess the number in the bag. The clues should be written on the chalkboard.
 - There are 11 blocks in my bag.
 - The blocks show a number that is greater than 100 and less than 200.
 - There are exactly 6 units (ones).
 - Which blocks are in this bag?
- Have the children use base ten blocks to represent the number in the bag.
- When the students are ready, have them reveal their answers and their explanations for their solutions.

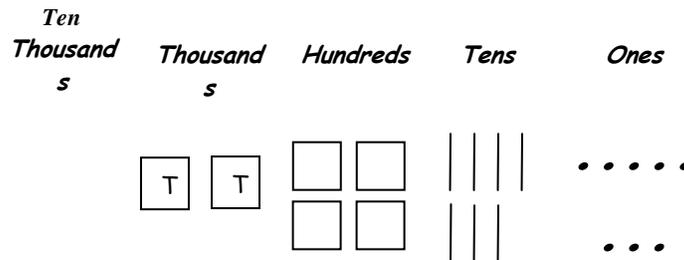
- The students can do a gallery walk around the classroom to view each person's representation.
- Discuss the clues and how some clues are better than others (clue 3).
 - Ask: Which clue helped you the most? Explain how that clue helped you.
 - Ask: What was hard for you? What was easy?
- Repeat with a new number in the bag as needed for reinforcement.

Teacher Facilitation/Student Application

- Write 237 on the board and have a volunteer explain which base ten blocks would represent that number (2 flats, 3 longs, 7 units).
- Show the representation using overhead base ten blocks and discuss with students what the value of each digit is.
- Introduce and discuss the thousands and ten thousands place.
 - Say: "Does anyone know how many hundreds are in one thousand?" Accept and discuss student answers. Stack 10 flats to make a thousand cube as a visual representation.
 - Say: "How many thousands are in 10 thousand?" If students have difficulty giving the answer of 10, remind them that there are 10 ones in 10, and 10 tens in 100 etc.
- Distribute the Place Value Mat (Student Resource 1).
 - Say: "Write the number 2,487 on your place value mat." When students have finished, discuss where they placed each number. Ask questions like, "How did you decide what number to place in the thousands column?"
 - "On your mat, draw a picture that represents 2,487." Allow time for the students to draw their picture. "How did you represent your number using pictures?" Discuss student responses. Show students that for upcoming problems they can draw a box with a T to represent thousands and a box with TT to represent ten thousands.



- On chart paper draw a place value chart to ten thousands. Then model for students how to record 2,478 in the chart.



- “What number is 3 hundreds more than 2,487? Use your resources to find a solution.” Allow students to share answers.
- “What are some ways you were able to figure that out?” Students could answer that they looked at their pictures, or just added 3 hundreds to the 4 hundreds that was already in the hundreds column.
- Give the students 4 more numbers through 99,999 and have them place the digits in the correct places on the Place Value Mat and draw a picture for reinforcement.
- Distribute Mystery Number (Student Resource 2) and have students complete independently. Answer key can be found on Teacher Resource 2.

Embedded Assessment

- Using the Observation Checklist (Teacher Resource 1), carefully walk around the room while the students are completing the Place Value Mat and Mystery Number worksheet. Note students who respond correctly and students who are having difficulty.

Reteaching/Extension

- Reteach: Use small group instruction to reteach the concept. Distribute additional Place Value Mat (Student Resource 1). Have students roll 3 dice (gradually working up to 5 dice). Manipulate the dice to make the largest and smallest number. Ask, “How did you determine where to place the digits?”
- Extend: Distribute Create Your Own Mystery Number (Student Resource 3). Have students complete the sheet with a partner.

Lesson 2

Pre-Assessment/Launch

- Show the students an assembled Place Value Tent (Teacher Resource 3). Point out that the tent has 3 sides and numbers can take 3 forms.
- Say: “What are the three forms of a number? Talk about the question with a partner.” (*standard-345; word-three hundred forty five; expanded- 300 + 40 + 5*).
- Give each student a pre-cut square and model how to fold and cut the square. Then have students label 3 of the 4 sides with the forms and above examples. Have them glue the square to finish the tent.
- The students should keep the tents on their desks to reference throughout the lesson.

Teacher Facilitation/Student Application

- Distribute small dry erase boards.
- Use the “write, hide, show” method. The students write the answer, hide it with their tissue/sock/eraser, and show it when you ask.
- Give the students the following examples on the overhead starting with various forms. Have them complete the remaining two forms on their dry erase boards. If you give the students the standard form, they should write the number in word and expanded form. Use the examples listed.

- Four thousand two hundred two
- 65,432
- $10,000 + 8,000 + 600 + 90 + 7$
- Give additional examples following the same process
- Explain the card game, Place Value War.
 - The students work in pairs. Each pair has a bag with Place Value War Cards (Teacher Resource 4).
 - Each student chooses 1 card from the bag. The student with the larger number wins both cards.
 - The student with the most cards when all of the cards in the bag are gone wins the game.

Embedded Assessment

- Using the Observation Checklist (Teacher Resource 1), carefully walk around the room while the students are playing Place Value War. Note students who respond correctly and students who are having difficulty.
- Give each student a 4 x 6 inch index card. Have the students write any number with 5 digits on the card in standard form. They should also write the number using words and expanded form. Collect the cards to assess the students' understanding of the lesson.

Reteaching/Extension

- Take the students to the computer lab for this section of the lesson.
- Reteach: Post the directions on chart paper.
 - Log on to <http://nlvm.usu.edu/>
 - Click on **Numbers and Operations Grades 3-5**
 - Click on **Base Ten**
 Have students represent numbers to 9,999 to represent using their online base ten blocks. Then have students come up to the chart paper and write the numbers in each of the three forms.
- Extend: Post the directions on chart paper for the students who understood the lesson and can work independently.
 - Log on to <http://gamequarium.com/placevalue.html>
 - Click on **Place Value to 100,000**
 - Follow the directions on how to play the game.

Lesson 3

Pre-Assessment/Launch

- Put the students into pairs and give them a deck of cards with only the numbers 1-9 (use the ace as number 1).
- Say: "Each person picks 5 cards. After cards are chosen, put them in any order you would like. You have 2 minutes to pick your cards and decide where you want each card."
Say: "Now that your cards are where you would like them, you are NOT allowed to move them. Each of you has a 5 digit number in front of you."

Practice reading your number with your partner. Raise your hand if you need any help.”

Say: “I want you to think about which person has the bigger number and why. When you have made your decision, make sure you can explain why you chose the number you did.”

- Now call on students pairs and have them share their answers and explanations for which number is bigger.

Teacher Facilitation/Student Application

- On the chalkboard, post two numbers that were prewritten on construction paper- 34,537 and 34,628
- The students should work in a small group.
- Say, “Think about what you know about place value to decide which number is greater. How can we decide which number is greater?”
- Have one student per group share responses aloud and discuss how you would decide which number is larger. Ask one student to place the correct sign ($<$, $>$, $=$) between the numbers .
- Place one number above the other to reinforce how to decide which is larger.

Say: “When we look at the numbers this way, we can focus on one place at a time to decide which is larger. First, look at the ten thousands place (Point to the place). What do you notice about that place? (Both numbers have 3 ten thousands; they are equal).

Continue this until you can make a decision about which number is larger (looking at the hundreds place, you can tell that 34,628 is larger because it has 6 hundreds and the other number only has 5 hundreds).

- Repeat the process with two new numbers.
- Introduce the Place Value Game. Give the directions before putting the students into pairs and distributing supplies.
 - Say: “You will work with a partner. Each person will get a Place Value Game Board (Teacher Resource 5) and one deck of cards to share with your partner.
 - Your goal is to make the greater number.
 - You will take turns picking one card from the top of the deck. Once you pick your card, you have to decide which place to put the card in. For example, if I pick a 9, can you give me advice on where I should put that number? (the ten thousands because that is the highest number I can choose from the deck)
 - You cannot move your card once you put it down.
 - Each student will choose 5 times. When they are finished picking cards, they will record their number and their partner’s number on the Comparing Numbers (Student Resource 4) worksheet and put the correct symbol in the middle.
 - Clear your game boards and play again until you are finished the deck of cards. You can shuffle and play again if you have more time.

- Distribute the Bag of Greater Than? Cards (Teacher Resource 6) and the Greater Than? (Student Resource 5) worksheet for this individual activity.
- Give the directions:
 - Say: “You are completing this activity by yourselves. You will pick 2 numbers from the bag and record them on your worksheet. Then you have to decide which sign to put in the middle ($<$, $>$, $=$). Put those two numbers aside and choose two new numbers. Repeat this until your bag of numbers is finished. Make sure you use at least one $<$ and one $>$ on your worksheet.”
- Have the students share some of their combinations with a partner first, then as a whole class. Record 3-5 answers on the board and have the students discuss how they decided which sign to use.

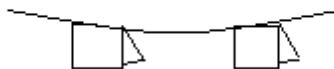
Embedded Assessment

- Using the Observation Checklist (Teacher Resource 1), carefully walk around the room while the students are playing the Place Value Game and completing the individual activity. Note students who respond correctly and students who are having difficulty.
- Collect the *Greater Than?* Worksheet to assess the student’s individual understanding.

Reteaching/Extension

- Reteach: Use the bag of Greater Than? Cards (Teacher Resource 6) from the individual activity (or just write smaller numbers if the students are having a lot of difficulty). Have students take turns choosing two numbers. Write the numbers on the board. Use different methods to explain how to decide which number is larger (drawing picture of base ten blocks, comparing each place, writing expanded form).
- Extend: Have the students work in groups of 5-7. Two students will hold a rope/string. On one end will be the 10,000 number card and on the other end will be the 20,000 number card. The remaining students will place the rest of the number cards in the correct place on the number line.
 - Make the number cards before the lesson. Fold a 4x6 index card in half. Write any numbers between 10,000 and 20,000 on one side. The cards hang on the number line.

Example: Number Line



Summative Assessment:

- This assessment has three sections (Student Resource 6; Answer Key-Teacher Resource 7).

- The first section involves the students answering selected response questions.
- The second section involves the students answering short answer questions where the students need to write their answer to the question.
- The third part is a Brief Constructed Response where students need to demonstrate both their knowledge of place value, but also explain how they determined their answer (see Teacher Resource 5 for BCR Rubric) using numbers, pictures, and/or words.

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PLACE VALUE MAT

Ten *Thousands* *Hundreds* *Tens* *Ones*
Thousands ,

Name _____

Mystery Number

Use the clues to fill in the mystery number in the blanks below. Then draw a model representing the number in each box. Complete both problems.

- Put a seven in the tens place.
- Put a two in the thousands place.
- Put a five in the ones place.
- Put a zero in the remaining place.

_____ , _____



-
- Put an eight in the ones place.
 - Put a three in the ten thousands place.
 - Put a one in the hundreds place.
 - Put zeros in the remaining places.

_____ , _____



Create Your Own Mystery Number

Choose a 4 digit number and write it in a secret place. Write clues that will help your partner find each digit. Exchange clues and solve.

Example:

- My number has a 6 in the ones place.
- In the hundreds place is a number that is two less than the ones place.
- In the thousands place is a number that is three more than the ones place.
- In the tens place is a 5.

 9 4 5 6

Write your clues below.

1. _____

2. _____

3. _____

4. _____

Exchange and solve.

For a challenge try writing clues for a 5 digit number on the back of the paper.

Name _____ Date _____

Comparing Numbers

Your # < > = Partner's #

Name _____

Greater Than?

1. Pull two numbers from the bag.
2. Write them on the blanks.
3. Compare the numbers using $<$, $>$, $=$.
4. Continue until you have used all the numbers in your bag.

1. _____	○	_____
2. _____	○	_____
3. _____	○	_____
4. _____	○	_____
5. _____	○	_____
6. _____	○	_____
7. _____	○	_____
8. _____	○	_____
9. _____	○	_____
10. _____	○	_____

Name: _____

Date _____

Place Value Assessment

1. 5,786

- A. hundreds
- B. thousands
- C. ten thousands
- D. tens

2. 45, 033

- A. ones
- B. tens
- C. hundreds
- D. thousands

3. 35, 487

- A. tens
- B. ten thousands
- C. thousands
- D. millions

4. 456,372

- A. thousands
- B. ten thousands
- C. hundred thousands
- D. hundreds

5. Joey has 536 jelly beans. Paul has 365 jelly beans. Jenny has 653 jelly beans. Beth has 635 jelly beans. Who has the most?

- A. Joey
- B. Paul
- C. Jenny
- D. Beth

7. Which number expression is true?

- A. $436 < 466$
- B. $738 < 783$
- C. $203 > 230$
- D. $980 < 1,000$

8. Write 5, 406 in word form.

9. Write six thousand ten in standard form.

10. Write $5,000 + 400 + 30 + 1$ in standard form.

Brief Constructed Response

Dana has \$2,356 in her bank account. Chrissy has \$2,385 in her bank account.

Part A

Write a number expression that compares how much money Dana and Chrissy have using $<$, $>$, or $=$.

Part B

Use what you know about place value to explain why your answer is correct. Use number and words in your explanation.

Observation Checklist

Day 1

Day 2

Day 3

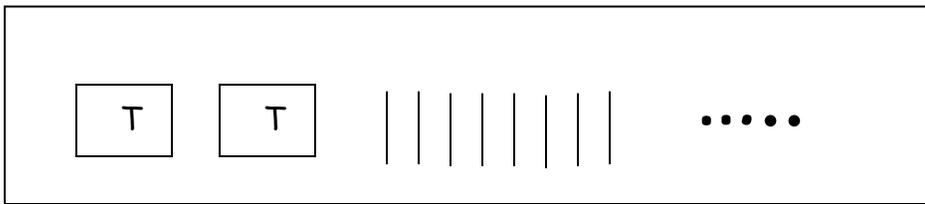
Student Names

Mystery Number

Use the clues to fill in the mystery number in the blanks below. Then draw a model representing the number in the box. Complete both problems.

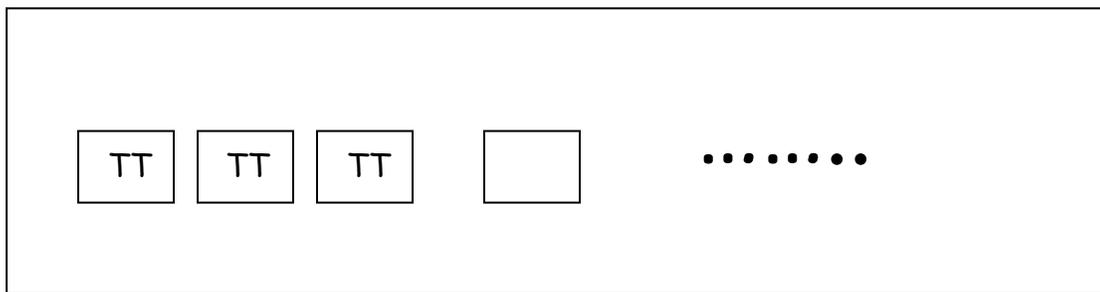
- Put a seven in the tens place.
- Put a two in the thousands place.
- Put a five in the ones place.
- Put a zero in the remaining place.

_____ 2 _____ , _____ 0 _____ 7 _____ 5 _____



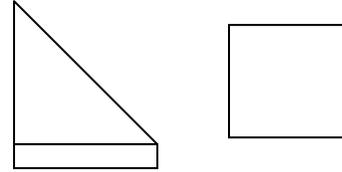
- Put an eight in the ones place.
- Put a three in the ten thousands place.
- Put a one in the hundreds place.
- Put zeros in the remaining places.

_____ 3 _____ 0 _____ , _____ 1 _____ 0 _____ 8 _____

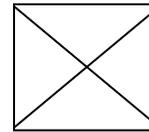


Place Value Tent

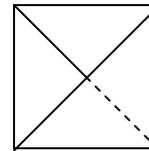
1. Fold an $8\frac{1}{2} \times 11$ sheet a paper diagonally to make a square. Cut off the excess paper.



2. Open the paper and fold it the opposite way to make an X across the paper.

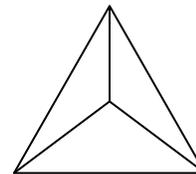


3. Cut one of the folds to the center of the X. This will make two triangular flaps.



4. Have students label the tent according to the directions in the lesson.

5. Glue one of the flaps under the other, making a tent.



Place Value War Cards

547

375

208

618

199

921

**Four
hundred two**

**Eight
hundred
forty eight**

**Six hundred
twenty**

**Two hundred
seventy-
three**

**Nine
hundred
twenty-one**

**Seven
hundred
eleven**

**Seven
hundred
fifty-two**

$$100 + 30 + 9$$

$$800 + 70 + 2$$

$$200 + 2$$

$$400 + 40 + 4$$

$$500 + 50$$

$$700 + 50 + 3$$

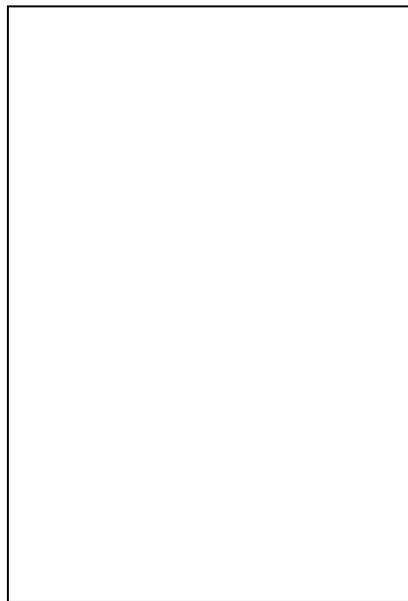
$$300 + 10 + 8$$

Place Value Game Board Directions

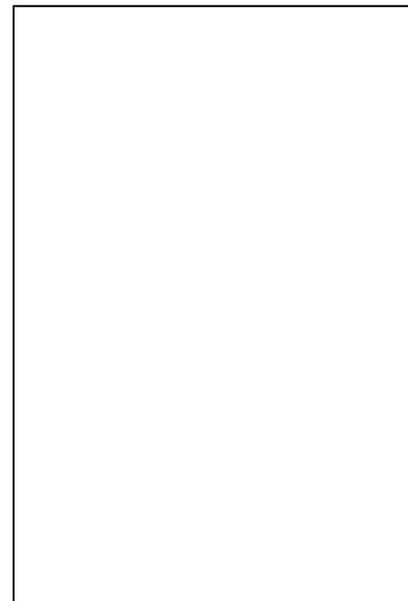
1. Glue or tape pages 2 and 3 of this resource together. Laminate if desired.
2. To each pair of students distribute playing cards 1 - 9 of all suits. If playing cards are not available label 36 index cards with numbers 1 - 9 (4 of each number).

PLACE

Ten Thousands



Thousands



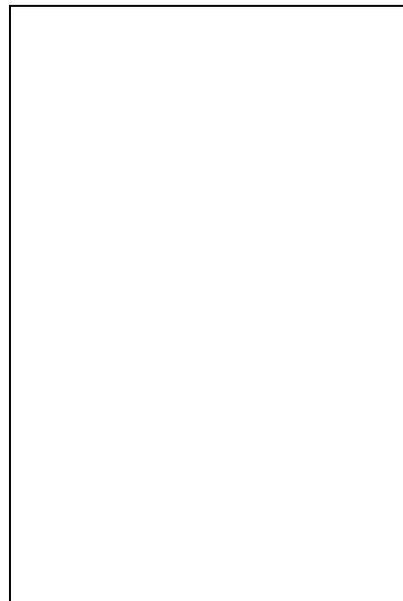
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VALUE

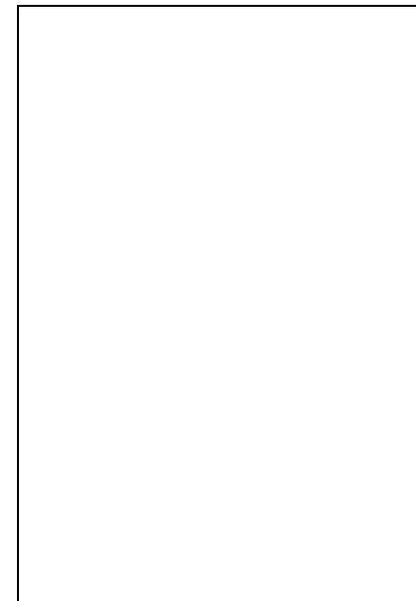
Hundreds

An empty rectangular box with a black border, intended for writing a digit in the hundreds place.

Tens

An empty rectangular box with a black border, intended for writing a digit in the tens place.

Ones

An empty rectangular box with a black border, intended for writing a digit in the ones place.

Greater Than? - Set of Cards

563 365 718 871 2,368

2,338 5,409 9,057 12,354 13,245

46,620 64,260 8,317 3,781 28,953

28,539 66,704 67,074 17,842 18,127

Name: _____

Date _____

Place Value Assessment

1. 5,786

- E. hundreds
- F. thousands
- G. ten thousands
- H. tens

2. 45, 033

- E. ones
- F. tens
- G. hundreds
- H. thousands

3. 35, 487

- E. tens
- F. ten thousands
- G. thousands
- H. millions

4. 456,372

- E. thousands
- F. ten thousands
- G. hundred thousands
- H. hundreds

5. Joey has 536 jelly beans. Paul has 365 jelly beans. Jenny has 653 jelly beans. Beth has 635 jelly beans. Who has the most?

- E. Joey
- F. Paul
- G. Jenny
- H. Beth

7. Which number expression is true?

- E. $436 < 466$
- F. $738 < 783$
- G. $203 > 230$
- H. $980 < 1,000$

8. Write 5,406 in word form.

five thousand four hundred six

9. Write six thousand ten in standard form.

6,010

10. Write $5,000 + 400 + 30 + 1$ in standard form.

5,431

Brief Constructed Response - 3 Total Points

Dana has \$2,356 in her bank account. Chrissy has \$2,385 in her bank account.

Part A - Worth 1 Point

Write a number expression that compares how much money Dana and Chrissy have using $<$, $>$, or $=$.

$\$2,356 < \$2,385$ or $\$2,385 > \$2,356$

Part B - Worth 2 Points

Use what you know about place value to explain why your answer is correct. Use number and words in your explanation.

- Students should explain that they first looked at the thousands place and the numbers were the same.
- Then they looked at the hundreds place and the numbers were also the same.
- They had to look at the tens place to find a different number.
- Then they should state that they knew 8 tens is greater than 5 tens or 5 tens is less than 8 tens.
- They also might say they know that 80 is greater than 50 or 50 is less than 80. Either response is acceptable.
- Students who fully explain their answer should receive 2 points. Students who partially explain should receive 1 point. If explanation is incorrect or unrelated to place value they should receive 0 points.