

Second Grade Elementary Math Planning Guide for Common Core Place Value Skills

Selections were adapted and taken from the <http://elementarymath.cmswiki.wikispaces.net> site.

This document is designed to support teams of teachers as they plan. It is expected that our understanding of the Common Core State Standards will continue to deepen as we proceed with implementation. To capture and enhance our collective understanding, we have provided a Common Core link for each grade level on the Elementary Math Wiki. Please add your comments at <http://elementarymath.cmswiki.wikispaces.net/>. **Thank you to the following teachers for their work on this project:** Kharma Banks, Bradley Booher, Jennifer Caenepeel, Susan Copeland, Jodi Johnson, Monica Feaster, Margaret Hershey-Mason, Penny Kronenwetter, Errin Schie

2.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. Second graders extend the work from 2.NBT. to two 3-digit numbers. Students should have ample experiences using concrete materials and pictorial representations to support their work. This standard also references composing and decomposing a ten. This work should include strategies such as making a 10, making a 100, breaking apart a 10, or creating an easier problem. The standard algorithm of carrying or borrowing is not an expectation in Second Grade. Students are not expected to add and subtract whole numbers using standard algorithms until the end of Fourth Grade.

Example: $354 + 287 = \underline{\quad}$

Student A

I started at 354 and jumped 200. I landed on 554. I then made 8 jumps of 10 and landed on 634. I then jumped 6 to land on 640. Then I jumped 1 more and landed on 641. $354 + 287 = 641$

Student B

I used place value blocks and a place value mat. I broke all of the numbers and placed them on the place value mat.

I first added the ones. $4 + 7 = 11$.

I then added the tens. $50 + 80 = 130$.

I then added the hundreds. $300 + 200 = 500$.

I then combined my answers. $500 + 130 = 630$. $630 + 11 = 641$.

Student C

I used place value blocks. I made a pile of 354. I then added 287. That gave me 5 hundreds, 13 tens and 11 ones. I noticed that I could trade some pieces. I had 11 ones, and traded 10 ones for a ten. I then had 14 tens, so I traded 10 tens for a hundred. I ended up with 6 hundreds, 4 tens and 1 one. So, $354 + 287 = 641$

Example: $213 - 124 = \underline{\quad}$

Student A

I used place value blocks. I made a pile of 213. I then started taking away blocks. First, I took away a hundred which left me with 1 hundred and thirteen. I need to take away 2 tens but I only had 1 ten so I traded in my last hundred for 10 tens. Then I took two tens away leaving me with no hundreds and 9 tens and 3 ones. I then had to take 4 ones away but I only have 3 ones. I traded in a ten for 10 ones. I then took away 4 ones. This left me with no hundreds, 8 tens and 9 ones. My answer is 89. $213 - 124 = 89$

2.NBT.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. Second Grade students mentally add or subtract either 10 or 100 to any number between 100 and 900. As teachers provide ample experiences for students to work with pre-grouped objects and facilitate discussion, second graders realize that when one adds or subtracts 10 or 100 that only the tens place or the digit in the hundreds place changes by 1. As the teacher facilitates opportunities for patterns to emerge and be discussed, students notice the patterns and connect the digit change with the amount changed. Opportunities to solve problems in which students cross hundreds are also provided once students have become comfortable adding and subtracting within the same hundred.

Example: *Within the same hundred*

What is 10 more than 218?

What is $241 - 10$?

Example: *Across hundreds*

$$293 + 10 = \square$$

What is 10 less than 206?

This standard focuses only on adding and subtracting 10 or 100. Multiples of 10 or multiples of 100 can be explored; however, the focus of this standard is to ensure that students are proficient with adding and subtracting 10 and 100 mentally.

2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations. Explanations may be supported by drawings or objects.

Second graders explain why addition or subtraction strategies work as they apply their knowledge of place value and the properties of operations in their explanation. They may use drawings or objects to support their explanation. Once students have had an opportunity to solve a problem, the teacher provides time for students to discuss their strategies and why they did or didn't work.

Example: **There are 36 birds in the park. 25 more birds arrive. How many birds are there? Solve the problem and show your work.**

Student A

I broke 36 and 25 into tens and ones $30 + 6 + 20 + 5$. I can change the order of my numbers, since it doesn't change any amounts, so I added $30 + 20$ and got 50. Then I added 5 and 5 to make 10 and added it to the 50. So, 50 and 10 more is 60. I added the one that was left over and got on 6 to get 61. So there are 61 birds in the park.

Student B

I used place value blocks and made a pile of 36 and a pile of 25. Altogether, I had 5 tens and 11 ones. 11 ones is the same as one ten and one left over. So, I really had 6 tens and 1 one. That makes 61.

Example:

One of your classmates solved the problem $56 - 34 = \underline{\quad}$ by writing "I know that I need to add 2 to the number 4 to get 6. I also know that I need to add 20 to 30 to get 50. So, the answer is 22." Is their strategy correct? Explain why or why not?

Student: I see what they did. Yes. I think the strategy is correct. They thought, '34 and what makes 56?' So they thought about adding 2 to the 4 to get 6. Then, they had 36 and needed 56. So, they added 20 more. That means that they added 2 and 20 which is 22. I think that it's right.

Example: **One of your classmates solved the problem $25 + 35$ by adding $20 + 30 + 5 + 5$. Is their strategy correct? Explain why or why not?**

Student: Well, $20 + 30$ is 50. And $5 + 5$ is 10. So, $50 + 10$ is 60. I got 60 too, but I did it a different way. I added 25 and 25 to make 50. Then I added 5 more and got 55. Then, I added 5 more and got 60. We both have 60. I think that it doesn't matter if you add the 20 first or last. You still get the same amount.

Plus-Minus Stay the Same

Materials

100 chart to share between 2 players
Deck of numeral cards 1-9, four of each numeral
Distinct markers for each player

Players: 2

Directions

1. Decide which player will go first. The first player chooses 2 numeral cards from the deck. Determine which card is the tens digit and which card is the ones digit. For example, if 2 and 4 are drawn the player can use these cards as 24 or 42.
2. Player one must decide whether to keep the number the same and mark it, add 10 to this number, or subtract 10 from this number. After the decision is made, player 1 covers the number on his/her chart. For example, if the player decides to use 42 the player can cover 42, 32, or 52.
3. Player two chooses two numeral cards from the deck, determines the number, and decides whether to add 10 to the number, subtract 10 from the number or stay with the number. Player 2 covers the number on the 100 chart.
4. Players continue to play.
5. The winner is the first player to cover 3 numbers in a row. Rows can be vertical, horizontal or diagonal. The game can be made more difficult by having students cover 4 or 5 numbers in a row.
6. Decide which player will go first. The first player chooses 2 numeral cards from the deck. Determine which card is the tens digit and which card is the ones digit. For example, if 2 and 4 are drawn the player can use these cards as 24 or 42.
7. Player one must decide whether to keep the number the same and mark it, add 10 to this number, or subtract 10 from this number. After the decision is made, player 1 covers the number on his/her chart. For example, if the player decides to use 42 the player can cover 42, 32, or 52.
8. Player two chooses two numeral cards from the deck, determines the number, and decides whether to add 10 to the number, subtract 10 from the number or stay with the number. Player 2 covers the number on the 100 chart.
9. Players continue to play.
10. The winner is the first player to cover 3 numbers in a row. Rows can be vertical, horizontal or diagonal. The game can be made more difficult by having students cover 4 or 5 numbers in a row.

Name _____ Date _____

Solve each problem. Show how you solved it using words, pictures or numbers.

1. 29 children were sitting on the bus. 10 more children got on the bus. How many students are on the bus now?

2. 83 pebbles were in the fish tank. Mrs. Jones took some out to clean the fish tank. Now there are 73 pebbles in the tank. How many did she take out?

3. 45 red apples and 10 green apples are on the table. How many apples are on the table?

4. 91 students are in the media center looking for books. 10 students leave the media center. How many students are now in the media center?

5. 36 seashells are on the beach. A wave washes away 10 seashells. How many are now on the beach?

6. There were 33 children in the cafeteria. 10 children got hotdogs. The rest got hamburgers. How many got hamburger

Name _____ Date _____

Solve each problem. Show how you solved it using words, pictures or numbers.

1. 29 children were sitting on the bus. 30 more children got on the bus. How many students are on the bus now?

2. 83 pebbles were in the fish tank. Mrs. Jones took some out to clean the fish tank. Now there are 43 pebbles in the tank. How many did she take out?

3. 45 red apples and 50 green apples are on the table. How many apples are on the table?

4. 91 students are in the media center looking for books. 70 students leave the media center. How many students are now in the media center?

5. 36 seashells are on the beach. A wave washes away 20 seashells. How many are now on the beach?

6. There were 63 children in the cafeteria. 30 children got hotdogs. The rest got hamburgers. How many got hamburgers?

Name _____ Date _____

Solve each problem. Show how you solved it using words, pictures or numbers.

1. 129 children were sitting on the bus. 20 more children got on the bus. How many students are on the bus now?
2. 283 pebbles were in the fish tank. Mrs. Jones took some out to clean the fish tank. Now there are 173 pebbles in the tank. How many did she take out?
3. 345 red apples and 40 green apples are on the table. How many apples are on the table?
4. 191 students are in the media center looking for books. 30 students leave the media center. How many students are now in the media center?
5. 336 seashells are on the beach. A wave washes away 100 seashells. How many are now on the beach?
6. There were 533 children in the cafeteria. 200 children got hotdogs. The rest got hamburgers. How many got hamburgers?

Glossary

Table 1. Common addition and subtraction situations.

Add to	Result Unknown <i>Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now?</i> $2 + 3 = ?$	Change Unknown <i>Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two?</i> $2 + ? = 5$	Start Unknown <i>Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before?</i> $? + 3 = 5$
	Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? $5 - 2 = ?$	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? $5 - ? = 3$
Put Together/ Take Apart	Total Unknown Three red apples and two green apples are on the table. How many apples are on the table? $3 + 2 = ?$	Addend Unknown Five apples are on the table. Three are red and the rest are green. How many apples are green? $3 + ? = 5, 5 - 3 = ?$	Both Addends Unknown₂ Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$
	Compare	Difference Unknown (“How many more?” version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? (“How many fewer?” version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? $2 + ? = 5, 5 - 2 = ?$	Bigger Unknown (Version with “more”): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? $2 + 3 = ?, 3 + 2 = ?$

2nd Grade Number Sense Lesson Plan - Place Value



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Juab School District Number Sense

June 2008 Place Value

Teacher Note: This lesson would be best taught shortly after teaching expanded form. (With Saxon Edition 2 it is lesson 84.) It could also be used as a review lesson towards the end of the year. If base-ten blocks are not available for each student, you can use graph paper to make your own. I copied a 1/2 inch grid onto cardstock and cut out hundred flats, ten sticks, and one cubes.

Standard I/Objective 1/Indicator a

Represent whole numbers in groups of hundreds, tens, and ones using base ten models and write the numeral representing the set in standard and expanded form.

Learning Target

- 1) Students will understand place value--the value of a digit depends upon its place or position in a number.
- 2) Students will represent given numbers up to a value of 999 using models, standard form, and expanded form.
- 3) Students will determine the value of a digit in a given number.
- 4) Students will communicate their understanding in their math journals.

Big Rock Concept

Number Sense

Process Skills

Represent

Communicate

Cue Set/Recall Prior Knowledge: (Write the numbers 12 and 21 on the board.) **Which of these numbers is larger? How do you know?** (Accept several answers. Challenge the students by pointing out that each number has the digit 2 and the digit 1.) **That's right. We have learned about place value. You will remember that place value means that the value of a digit**

Place Value and Everything in its Place

depends upon its place or position in a number. We can see that the digit 2 appears in different places in these two numbers so we know that the value of the 2 is different in each number. What is the value of the 2 in the number 12? What is the value of the 2 in the number 21?

Modeling/Instruction

Today we are going to strengthen our understanding of place value. To do this, we will represent or show numbers in several different ways. (Show table on overhead.) Let's begin with the number 124. First, I will write the number in standard form. Standard form is the usual way that we write a number. Now I will use the base-ten blocks to represent the number. I first look at the hundreds place. I see that there is 1 hundred so I will use one flat. Next, I look at the tens place and see that my number has 2 tens. I will use 2 ten-sticks (longs) to show my number. Finally, I will look at the ones place. My number has 4 ones. I will use 4 one-cubes. Now I have shown the number 124 with my base-ten blocks. I am going to draw a picture of my blocks on my chart. (Draw picture.)

The next way I will represent the number 124 is using expanded form. You will remember that expanded form is like stretching the number out to show the value of each digit added together. The digit 1 is found in the hundreds place so I know that its value is 100. The digit 2 is in the tens place so its value is 2 tens or in other words, 20. The digit 4 is in the ones place so it is worth 4. (Fill in the table as you think aloud.)

The last section of my table is labeled, "How Many?" In this section I will record how many hundreds, tens, and ones my number has. (As you model this section, be sure that students understand that it isn't 100 hundreds or 20 tens. If there is confusion, take them back to the base-ten blocks. Have them count the number of hundred flats, or ten-sticks.) I will first look at the hundreds. I see that I have a 1 in the hundreds place. I also see that I used one hundred flat to show my number. I know that 124 has one group of a hundred. (Continue explicit modeling and think aloud.)

Guided Practice

Give each student a copy of the table. Follow the same procedure as a class. Choose a slightly larger three-digit number such as 253. Scaffold the students as you complete another section together. As much as possible, let students lead you through the section. Ask questions to get students to explain their thinking. Complete as many numbers together as you see fit for your class.

Independent Practice

Assign numbers for students to complete on their own. You may want to have them choose their own number between 100 and 999 for the last section.

Check for Understanding

Move around the room to monitor work. Ask questions to have students explain their thinking and what they know. Have students hand in completed table to evaluate their understanding.

Active Participation

Use a random selection method, such as drawing sticks, for questions and participation.

Place Value and Everything in its Place

Closure

What did you learn today? What do you understand better than you did before? (Use random selection and accept as many answers as possible. Have students communicate their answer to one of the previous questions in their math journals.)

Ideas for Math Centers

- **Matching Games:** Core Academy resources have masters for matching expanded notation to standard notation or matching standard notation to pictorial representations. These can be found at www.uen.org under 2nd grade lesson plans. The lesson is entitled, "Go In and Out the Windows With Place Value." Download the Number/Picture Cards.
- **Stack-a-Value Cards:** Students can use these stackable cards to help visualize the relationship between standard notation and expanded notation. These are available at www.uen.org under 2nd grade lesson plans. The lesson is entitled, "Value That Number!" This lesson has several other fun resources and activities.
- **Largest Number Game:** Give each player a number cube. These can be with digits or dots. Each player will also need a sheet of paper to record his/her number. Each player takes turns rolling the cube and determining in which place to use the number. The goal is to create the largest number. The game can be played using as many place values as appropriate for the students.

Standard Form	Base 10 Blocks	Expanded Form	How many?
			_____ hundreds _____ tens _____ ones
			_____ hundreds _____ tens _____ ones
			_____ hundreds _____ tens _____ ones
			_____ hundreds

Place Value and Everything in its Place

			_____ tens _____ ones
			_____ hundreds _____ tens _____ ones
			_____ hundreds _____ tens _____ ones
			_____ hundreds _____ tens _____ ones

Name _____
 Date _____