

Elementary Mathematics: Utilizing Digital Technology to Assist in Teaching Place Value

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An independent project for the course EDTC 6431 “Learning with Technology”

Seattle Pacific University
MAT Program

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Phase I

Introduction

In this lesson, students will continue to evaluate place value in mathematics. They will be introduced to the hundreds place value and will work in cooperative groups to practice with new knowledge, work on a collaborative project, and electronically share their learning with the class.

Phase II

Analyse Learners

This math lesson is designed for second grade elementary math students. The current classroom population contains 22 students. There are four students on IEP's (individual education plans), two students are ELL's (English language learners), and the remainder have a range of abilities. None of the students on IEP's have physical disabilities but three of the four have behavioral issues. A paraeducator is assigned to this classroom to assist with all students.

In order for successful completion of the lesson, students will be preassessed to facilitate that they are prepared for this lesson. In this particular scenario, the teacher has been working with the class on mixed place value to understand that the two digits of a two-digit number represent amounts of tens, and ones; e.g., 26 equals 2 tens, and 6 ones. At the close of the previous lesson sequence, students were tested to verify if further instruction was needed prior to moving forward with the instruction of the hundreds place value. In the previous assessment there would have been a passing rate of 80% of students or higher.

During the introduction to instruction, students are evaluated utilizing an informal assessment process to facilitate that most to all students recall their previous learning. As outlined on the associated lesson plan, the class is asked to identify and write down numbers in specific place values. For example, the teacher writes a two-digit number (i.e. 64) using the interactive whiteboard. The class is asked to identify and write down the number that is in the tens place. Students are instructed to give a thumbs-up when they have their answers. They are asked not to reveal their answers to the rest of the class. When all thumbs are up, students are asked to show their white boards for the rest of the class to see. Students with the correct answer are called upon to tell those with incorrect answers how they knew the answer was 6.

The exercise is repeated two or three more times, only with different two-digit numbers of the teacher's choosing, to verify students' understanding of the ones and tens place value (i.e. 34,

15, 98, etc.). Students are then introduced to the learning target, $7 \cdot 100 + 0 \cdot 10 + 6 \cdot 1 = 706$.

Standards

7.CA.A.CB.7.CF.Y.G.H.U.B.X.U.F.X.G.

CCSS.MATH.CONTENT.2.NBT.1

Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.

Understand the following as special cases:

- 100 can be thought of as a bundle of ten tens — called a “hundred.”
- The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

1.G.H.9.G.H.I.X.Y.b.h.G.H.U.B.X.U.F.X.

1: Creativity and innovation

- Use models and simulations to explore complex systems and issues

2: Communication and collaboration

- Contribute to project teams to produce original works or solve problems

Objective

During the course of cooperative group activities, the paraeducator and teacher guide students at their stations then circulate to observe and assist all students. After this lesson, students should be able to identify the value of the hundreds, tens, and ones place and will plan to practice this learning individually and within cooperative groups over the next couple of math lessons.

Learning Target: I can identify the value of numbers in the hundreds, tens, and ones place.

Phase III

Strategies

During this lesson, there are several phases of instruction. There was a formal assessment prior to starting this lesson to facilitate at least an 80% pass rate prior to moving on with more material. Next, preliminary instruction is provided to the class as a whole to review material

further. Once this pre-assessment/preliminary instruction period is complete, a practice activity is introduced to the class as a whole to expand and scaffold this knowledge.

After students have participated as a class, they then break into constructive learning groups and work at individual stations on various activities. These stations rotate every ten minutes, allowing students various degrees of practice within constructive groups as well as on an individual basis. While students are working within their groups, the teacher also works with struggling students as necessary outside of the stations. The paraeducator is also utilized to continue direct instruction at one station utilizing the interactive whiteboard (as previously modeled by the teacher).

After forty minutes (five rotations), the groups reconnect and are informally assessed. Students are individually provided with a brief worksheet for a more formal assessment of learning that is to be turned in the next day. This worksheet is to be completed individually. Finally, a rubric is provided to facilitate that students can provide feedback, evaluating whether they feel they understand the material or need more practice.

Resources

1. **7`Uggfcca`GYhi d.** Gathering Carpet/Area Near Interactive White Board, Four Groups of Desks Arranged in Five Desks per Group, Teacher Table with Two Student Chairs/One Teacher Chair, Supplies Area, Five Desktop Computers at Computer Station/s, Interactive White Board with Connected Computer (with Drawing Software - Paint or Similar)
2. **5XX]hcbU`7`Uggfcca`FYgci fWg.** Magnetic Base Ten Blocks and Magnetic White Board, Five ipads with Math 1-2 App or similar [Starfall Website](#), [Base Ten Blocks and 22 Practice Worksheets, 22 Assessment Worksheets, Student Voice Rubric, 22 Note Cards](#)
3. **Ghi XYbhFYgci fWg.** Personal Whiteboards, Dry Erase Markers, Sock Erasers, Pencils

Phase IV

LESSON PLAN – Elementary Second Grade Place Value Lesson

@ggcb`DUfhi	5 Wlj]lmXYgW]d]cb#HYUW Yf`XcYg`	Ghi XYbly`Xc`
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Formal/Informal Assessment of Prior Learning or Preassessment (Ü^~^} &^Á •æð)	<p>The teacher has been working with the class on mixed place value to understand that the two digits of a two-digit number represent amounts of tens and ones; e.g., 26 equals 2 tens and 6 ones. At the close of the previous lesson sequence, students were tested to verify if further instruction was needed prior to moving forward with the instruction of the hundreds place value. 95% of the class was proficient in this assessment material passing the assessment with an 80% or higher.</p> <p><i>EÒŠŠÁMÚUUÜVÁ ãÁMÚUUÜVÁUÜÁ ÜVÜWÖŌŠŦŌŠÖŪPŌÜÜÁ Á W* Ā çã^} &^Á@ŋ@Ā ð iā Ā Á@Ā &{æ•Ā} ā^!•æ ā•Ā / ^ çā ~ Ā æ} ^ ā Ā &{ } c} Áæĵāæ•Ā@ŋ/Ā c ā^} • Ā Ā] !^} æ^āĀ Ā Ā} Ā ^, &{ } c} Ē</i></p>	Students took an assessment answering several questions reviewing the place value of tens and ones.
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HjhY`	Understanding Place Value of Hundreds, Tens, and Ones
GhUbXUfX`	<p>7 7 GG"A 5 H< "7 CBH9 BH"&'B6 H"% Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.</p> <p>Understand the following as special cases:</p> <ol style="list-style-type: none"> 100 can be thought of as a bundle of ten tens — called a “hundred.” The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

	<p>-GH9`Gh XYbhGfUbXUFX`</p> <p>1: Creativity and innovation</p> <p>c. Use models and simulations to explore complex systems and issues</p> <p>2: Communication and collaboration</p> <p>a. Contribute to project teams to produce original works or solve problems</p>
7 YbfU': cW g' f7 : L'	Understand Place Value of Ones, Tens, and Hundreds
5 WUXYa JW @b[i U[Y'	Identify, place value, hundreds, tens, ones

Learning Target (LT)	I can identify the value of numbers in the hundreds, tens, and ones place.	
Instruction (e.g. inquiry, preview, review, etc.)	<p>F9J9K`57HJ#M The teacher refers to the work completed on the last assessment (described above) and compliments the class on their hard work. Students are then instructed to take out their individual white boards and to write the answer to the upcoming question on their whiteboards.</p> <p>The teacher writes a two-digit number (i.e. 64) on the interactive whiteboard. The class is asked to identify and write down the number that is in the tens place. Students are instructed to give a thumbs-up when they have their answers. They are asked not to reveal their answers to the rest of the class.</p> <p>When all thumbs are up, students are asked to show their white boards for the rest of the class to see. Students with the correct answer are called upon to tell those with incorrect answers how they knew the answer was 6.</p> <p>The full exercise is repeated two or three more times, only with different two-digit numbers of the teacher's choosing, to verify students' understanding of the ones and tens</p>	<p>Each student is at their desk and has a small white board, a dry erase marker, and a sock to wipe the board with.</p> <p>Students should write the number 6 on their boards. Students then give a thumbs-up once they are done writing.</p> <p>Students show their answers and participate with questioning and discussion exercise.</p> <p>Students show their answers and participate with questioning and</p>

	place value (i.e. 34, 15, 98, etc.).	discussion exercise.
Informal Assessment	<p>9 @@GI DDCFH'UbX'GI DDCFH': CF` GHFI ; ; @B; `@5 FB9FG.ÁÁ!Á!{ ^Á !^æ[] Éáç^} • ÁÁ] ^æÁ! Ád` ** ^Á^!á * Á c@Á^çá, Éáç^!} æ^Á^••[] ÁÁ!^] æ^áÁ f!Á!ic@!Á^çá, Á Á} ^•ÁáÁ} • ÉÁ!{ ^Á •c á^} • Á æÁ! [cá^Ád` ** á * É@^Á q!Á^Á]! çá^áÁ á@Á@Á} * á * Áæ ^Á! Á!} á ^Á]!æç^Á á@ æ^Áç^ ^É</p>	
Practice Activity or Support	<p>The teacher prompts students to sit on the gathering carpet at the front of the room. The learning target for the day's lesson is projected on the interactive whiteboard as students read it aloud (as the teacher points to each word).</p> <p>The teacher then asks students to explain how they identified ones and tens previously. She uses a chart on the whiteboard and magnetic base ten blocks that students have worked with previously. Students are prompted to discuss and demonstrate knowledge using the chart. fBY:][i fY% 6 YckL` ..</p> <p>The teacher then writes a 3-digit number on the chart, introducing the hundreds spot, (e.g. 175). Students are then prompted to interpret and discuss the goals of the learning target for today's lesson. The teacher reviews academic vocabulary including place value, value, ones, tens, and the new place value, hundreds.</p> <p>The teacher asks students why they think this is important. A discussion will follow discussing the importance of place value and why the numbers of each place value should line up when adding and subtracting.</p> <p>The teacher asks which number is in the ones place? When the question is answered, the teacher writes the number 5 on a chart on</p>	<p>Students gather on the carpet and read-aloud with their teacher.</p> <p>Students raise their hands and explain this process, discuss, and demonstrate.</p> <p>Students raise their hands and discuss what they think their learning goals are for the lesson. Students listen to instruction.</p> <p>Á Á Students raise their hands and answer the question. Students listen to instruction.</p> <p>Students raise their hands and answer the question. Students raise their</p>

	<p>the whiteboard.</p> <p>The teacher then asks if anyone would like to place blocks on the board for this number.</p> <p>The teacher calls on a student.</p> <p>The teacher then asks which number is in the tens place. When the question is answered, the teacher writes the number 7 on the chart on the whiteboard.</p> <p>The teacher then asks if anyone would like to place blocks on the board for this number.</p> <p>The teacher calls on a student.</p> <p>The teacher then asks if anyone can say which number is in the hundreds place, can anybody guess? When the question is answered, the teacher writes the number 1 on the chart on the whiteboard.</p> <p>The teacher then introduces the hundreds block counting rows of ten aloud with the class. The teacher then places one hundred-block on the chart. The teacher adds the word @} á/á•Á to the classroom word wall.</p> <p>The teacher repeats the same steps above several more times with three digit numbers such as 125, 294, 504, and 927, building up each time. The students will volunteer to arrange blocks for hundreds as well on these tasks.</p> <p>Úc á} • Á@e Áq á^ á^ Á [/ \ á Á } Á/ ~ } c̄ * Á/ Á FEEÁ ~ / á * Áq } á á Á^ c̄, Á Á@Á [/ } á * • É Á 9 @@GI DDCFH'UbX'GI DDCFH': CF' GHFI ; ; @B; ' @5FB9FGÉ'Ú[á c̄ * Á/ Á , [/ á • Á / á * Á^ á á Áq ~ á Á c̄ á • Á / [/ c̄ • Á / á / á • Á q á Á @ } ^ { á Á q á } ^ • • ÉV @ Á , @ / á [á á Á @ c̄ á • Á^ } Á / [& / É q á Á [/ á Á , á / Á / [c̄ á / á c̄ á c̄ Á - Á c̄ á á Á^ - / } & • Á/ Á c @ Á ~ { / á Á / { } • Á q á Á c̄ á { á</p>	<p>hands. The selected student will place five one blocks on the ones column on the chart or call on a peer.</p> <p>Students raise their hands; one student will answer the question.</p> <p>Students raise their hands. The selected student will place seven tens blocks on the tens column on the chart or call on a peer.</p> <p>Students raise their hands. Students count aloud 1-2-3 to 10 with their teacher and watch instruction.</p> <p>Students participate in repeated activity as described above.</p>
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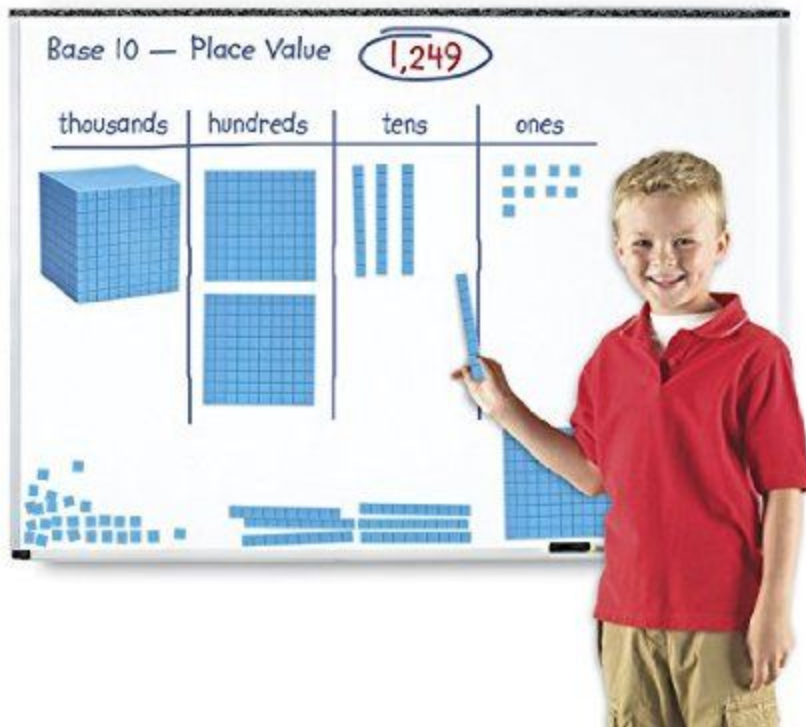
	<p>ç[&æ~ æ^ ÈKã ~ æ·Á·^âÁ ã@Á ç@Á ÁÖŠ· ÈÁ OZã & ··ã } Áæ[~ ó@Á æ} ã * Áæ*^oÁ]!'^] æ^·Ác'â^} ·Á' Á@Á æ@Á··[} ÈÁ O\ ã * Ác'â^} ·Á' Á ç!' '^ó@Á] [æ} &Á Á c@Á··[} Á@ ·Á' Á [ææ^Á^æ} ^!'·È</p>	
<p>Informal Assessment</p>	<p>Once it appears that all students understand the location of the hundreds place value, the teacher writes a three digit number on the interactive whiteboard, i.e. 164. Students are asked to write the number in the tens spot on their white boards and provide a thumbs up when they've finished. A student volunteer is then asked to come up and circle the correct number on the smartboard.</p> <p>This is repeated for the tens and ones place value. The full process is repeated a couple of times.</p> <p>9 @@GI DDCFH'UbX'GI DDCFH': CF' GHFI ; ; @B; ' @5 FB9FG'È' Gó@!'^Áæ^Á^ç^ æ^Ác'â^} ·Á@æÁ ·d' ** ã * È@Ác' } Áæ[ç^Á æ^Á^Á^] ^æ^âÁ f Á [!'Á ææ^È</p>	<p>Students should write the answer on their boards. Students then give a thumbs-up once they are done writing. Students raise hands to volunteer to circle answers on the interactive whiteboard. Students then share their answers.</p>
<p>Practice Activity or Support</p>	<p>Students are asked to go back to their desks. Student desks are arranged in four (4) groups or stations of five (5) students and one pair of students at the teacher table. Students are instructed to work in groups for 10 minutes prior to each rotation. One student from each group is prompted to get supplies.</p> <p>Station 1 – five (5) worksheets and a large set of base ten blocks fGYG:][i fY' '6 Yck Ł</p> <p>Station 2 – five (5) Ipads with Bean Works Factory application fGYG:][i fY' '6 Yck Ł</p> <p>Station 3 – Computer station already set up with headphones and website open. Students work on Starfall Website – How to Build a Robot Application and practice individually fGYG:][i fY' '6 Yck Ł (http://more2.starfall.com/m/math2/selected-2nd-content/load.htm?n=robot&d=demo&y=1&</p>	<p>Students go to their pre-assigned groups and one in each group goes to get supplies.</p> <p>Students work within groups to assist each other with practice at each station (except at station 3 where they practice individually). Stations rotate every 15 minutes.</p>

	<p>filter=second)</p> <p>Station 4 – five (5) students continue to practice at interactive white board with paraeducator</p> <p>Station 5 – two (2) students work individually with their teacher (these students are not timed on rotation and switch in and out when needed within rotating groups – struggling students as well as student/teacher communication).</p> <p>9 @@GI DDCFH'UbX'GI DDCFH': CF` GHFI ; ; @B; `@5 FB9FG'E`</p> <p>Ùc`á^} Á![[`]•Áe^Á! *æ`ã^áÁ[Á@eÁ •d`** ã *Á^æ} ^!•Áe^Á! ^!ÁÁ^æ@!Á •`]] [[!dZÖæ^áÁ^æ} ^!•Áe^Á! [Á çã^áÁ Á^Á]^ ^^!Á d`!•EÖe^Áe} Á &!•Á çæ`ã *Á^] ^•Á [Á&çã^Á•Á@]] •Á! [çã^Áeáãã } æÁã`æÁ !^Δ!^} &^Á! Áçæã`•Á^] ^•Á -Á^æ} ^!•E</p>	
<p>Informal Assessment</p>	<p>The teacher then writes another 3-digit number in the 200's range (i.e. 247) on the interactive white board and asks students to write numbers in the ones, tens, and hundreds spots on their white boards while assessing them as done previously.</p> <p>The teacher then writes increasingly complex numbers such as 350, 567, 858, and 999 on the interactive whiteboard. Time may run quickly or slowly during this assessment. The teacher then circulates and provides support when needed</p> <p>.</p> <p>9 @@GI DDCFH'UbX'GI DDCFH': CF` GHFI ; ; @B; `@5 FB9FG'E`</p> <p>Qs@Á æp`iã`Á Á@Á æ•Á} á^!•æ`á•Á@Á }^, Á æ^iæp`Á@Á , ã *Á!æcã^Áeçã`Á , ã Á}•^EÖÁ@Á æ•ÁÁd`** ã *EÖÁ f , ã *Á!æcã^Áeçã`Á ã Á^Á^] æ^áÁ æ@ { [!^Á d`&ç} Á ç [çã`Á@Áe^Áe} Á à &!•E</p>	<p>Students get their whiteboards; write and share answers as done previously in preliminary instruction.</p>
<p>Practice Activity</p>	<p>One student from each group is asked to put</p>	<p>Students put the materials</p>

<p>or Support</p>	<p>learning materials away.</p> <p>The teacher passes out a worksheet to all students. The worksheet is then projected (by the document camera) on the interactive whiteboard. The teacher explains the instructions by asking students to write how many hundreds, tens, and ones are shown by the base blocks and then write the number. FGYY:][i fY) '6 Yck Ł</p> <p>The teacher works on problem one with the class, repeating the processes described during the previous practice activities while asking students to raise their hands to provide answers.</p> <p>Students are then to complete the worksheet independently. The teacher circulates the classroom to provide individualized help to struggling students.</p> <p>Students are asked to turn in their assignments or take them home for homework if they need more time.</p> <p>9 @@GI DDCFH'UbX'GI DDCFH: CF ' GHFI ; ; @B; ' @5 FB9FG'È</p> <p>Y[[i • @^ • @œ^ Áã ~ ad^ ^ \^ } &^ • Áã áÁ &{ } • á c } o & @œ • Á / Áã á^ á^ ~]] [i o á ã @^ , Á { æ / áã È / @ Á^ æ @ / Á • ^ • Á dæ * á • Á^ & @œ • Á @ [È] ^ Á [È] ^ Á [Á / Á &œ / j á Á^ æ } á * Á i á / Á d Á @œ á * Á c á^ } o Á / áã È / Á } Á [[i • @^ o Á á^] ^ } á^ } d^ È</p> <p>Ùc á^ } o Á @ Á @œ^ Á & [{] ^ c á Á @ Á æ • á } { ^ } o Á / áã È Á } [, Á / Á æ Á / Á & [{] ^ c Á ^ } á á @ á Á [[i \ Á Á @ Á / Á &œ • i [[{ Á ^ È</p> <p>Ùc á^ } o Á @ Á @œ^ Á á á @ á Á @^ Á @œ * • Á @œ^ Á &œ • Á / Á @ Á &œ • i [[{ Á / áã È</p>	<p>away.</p> <p>Students watch instruction.</p> <p>Students watch instruction and raise hands to answer problem.</p> <p>Students work to complete the worksheet.</p> <p>Students who need more time may work on it in their own time. The worksheet is due the next day.</p>
<p>Closure Assessment of Student Voice</p>	<p>The teacher passes out prewritten notecards to the class. FGYY:][i fY) '6 Yck Ł</p> <p>Students are prompted to share their interpretation of the learning target and why they think this is important to learn.</p>	<p>Several students share their thoughts, fill out the notecards, and drop them in the classroom post box.</p>

Materials (In addition to resources listed in Phase III)

:][i fY%'6 UgY'HYb'A U[bYHjW6`cW_g'UbX'7\ Ufh



:][i fY&'Glu]cb'%K cf_g\ YfhG-8 9 '5 '

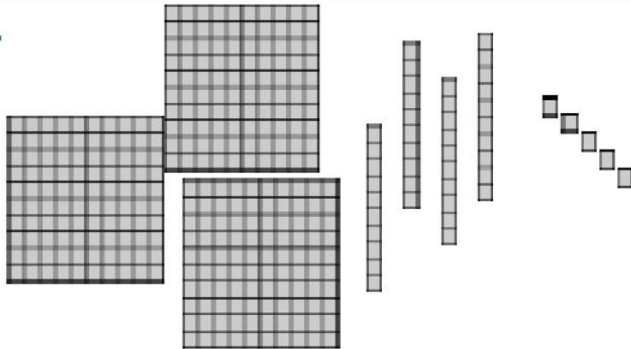
Name _____

CCSS 2.NBT.1 Understand place value

Place Value

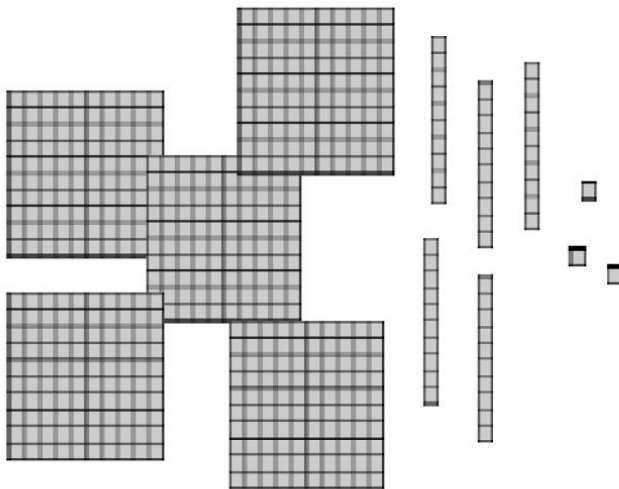
Directions: Write how many hundreds, tens, and ones are shown by the base blocks. Then write the number.

1.



hundreds	tens	ones

2.



hundreds	tens	ones

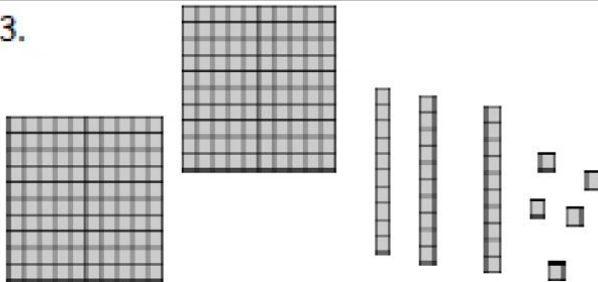
Name _____

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Place Value

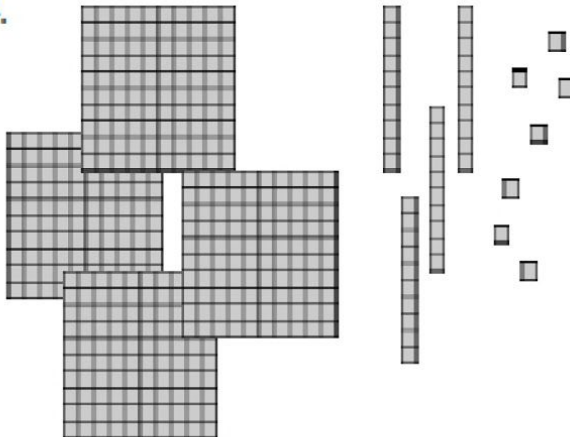
Directions: Write how many hundreds, tens, and ones are shown by the base blocks. Then write the number.

3.



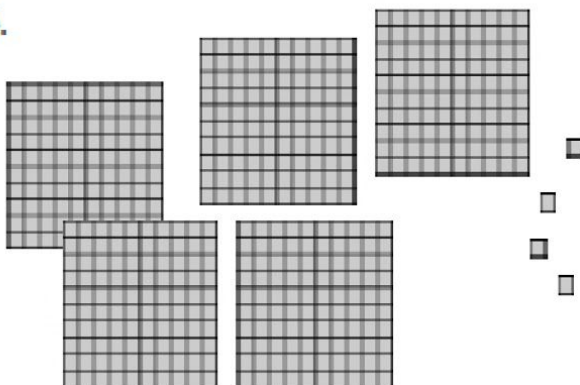
hundreds	tens	ones

4.



hundreds	tens	ones

5.



hundreds	tens	ones

:] [i f Y ' . ' G L U j c b ' & '] D U X ' 5 d d '] W U j c b ' .

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Q place value

BEAN WORKS FACTORY

Feed this bean-gobbling critter a little or a lot, and learn place value and equation-solving.

information

Category: Education
 Updated: Aug 23, 2012
 Version: 1.9.2
 Price: \$4.99
 Size: 146 MB
 Family Sharing: Yes
 Language: English
 Seller: School Zone Publishing
 © 2012 School Zone Publishing

Rated 4+
 Compatibility:
 OS X 10.6.6 or later

More by School Zone Publishing

- Kindergarten Pencil-Pal Education
- Alphabet Express Education
- Word Search - An Educ... Education
- Word Search Jr. - An E... Education

:][i fY (. 'GHUjcb" 'GHUZJ" K YVg]H. <ck 'rc'6i]X'UFcVchD'UW'JUi Y; Ua Y

more2.starfall.com

How to Build a Robot

Starfall

:][i fY) . 'K cf_g\ YHGi a a UHj Y5 ggYgga YbhZf' bX]j]Xi U'DfUW]W'

Name _____

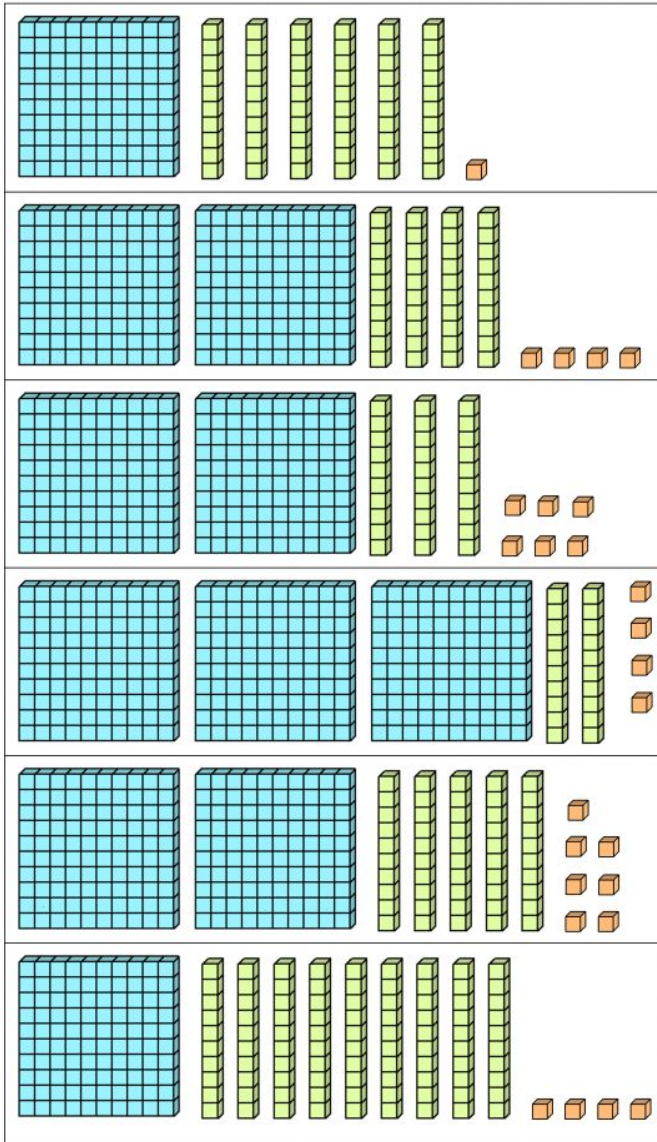
Date _____



PLACE VALUE BLOCKS TO 1000 SHEET 2



Match the balloons to the correct number.



217

236

161

194

178

324

244

257



2ND GRADE

MATH-SALAMANDERS.COM

: [[i fY* .7`cgi fY5 ggYgga YbhcZGhi XYbhJc]W'

