Lesson 1: Nine Layout

Candidate:		Field Supervisor
Date:	Grade: Kindergarten	Mentor:

Lesson Part	Activity description/Teacher does	Students do
Formal Preassessment (*Sequence start*)	**Presentation Tray:** one unit golden bead, a bar of ten golden beads, a square of one hundred golden beads, one cube of one thousand golden beads. Numeral cards: 1, 10, 100, 1000 Give standard 3 period lesson on: one unit, one ten, one hundred and one thousand. Match the numeral cards with the golden beads.	Count how many beads are in a unit bead, and in a ten bar. Count how many beads are in a ten bar. Count how many ten bars are in a one hundred square Count how many one hundred squares are in a one thousand cube. Match and identify the numeral card with the Golden Beads

Title	Lesson 1: Nine Layout
State Standard	CCSS.Math.Content.K.NBT.A.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. CCSS.Math.Content.1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones.
Central Focus (CF)	To help the student gain familiarity with the quantities and their names
Learning Target (LT)	Students will associate quantities with the printed symbols representing them.
Academic Language	Becoming familiar with quantities (function), tens, hundreds, thousands, layout, unit, digit, quantities
Instruction Inquiry	**Materials needed for 9 Layout:** • One box containing nine units • One box containing nine ten-bead bars • One box containing nine hundred-bead squares • One box containing one thousand-bead cube Display golden beads on a work rug. The unit beads in one column, the 10 bars in one column to the left of the unit beads, the hundred squares in one column to the left of ten bars. And the thousand cube to the left of the first hundred square. "Today we are going to work the 9 Layout. The 9 Layout is when we have 9 unit beads, [point to the column of unit beads], 9 ten bars [point to the column of ten bars], 9 hundred squares [point to the column of hundred squares],	Verify the quantities by counting them together with the student at the work rug. When counting the quantities, the units are placed to the student's right and the tens, hundreds and thousands are placed to the left in a horizontal row. Student brings the correct amount of golden beads. Counts the golden beads and counts the quantity.

	and one thousand cube [point to the thousand cube]."	Student takes the quantities back to the display before bringing another quantity.
	Ask the student to bring two-digit quantities. For example, "six UNITS and two TENS." Count with the student, "lets count the units…lets count the tens." Provide students with two more two-digit quantities. Then ask student to bring three-digit quantities, "Bring me four units, three TENS, and two HUNDREDS." Count with the student, "lets count the units…lets count the tens.. lets count the hundreds…". Provide students with two more three-digit quantities. Then ask student to bring four-digit quanties, "Please bring four UNITS, four TENS, four HUNDREDS and one HOUSAND. Count with the student, "lets count the units…lets count the tens...lets count the hundreds…lets count the thousands" At the conclusion, repeat what was brought. "You brought XXX UNITS, XXX TENS, XXX HUNDREDS and XXX THOUSAND." Now you get to pick how many golden beads you want to take from each place value. How much did you get?	Student places a quantity of golden beads on tray and identifies the quantity. If student demonstrates mastery of "fetching" two-digit numbers, then move on to three-digit numbers. If student is struggling with composing 11 to 19, then just practice doing this. Do not progress to quantities 20-99. If student is struggling with counting by tens, do not progress on to three-digit numbers. Have students practice composing numbers 1-99.
Practice Activity Support	**Materials needed for Display of numeral cards:** A box containing large numeral cards that increase in length with each place value: • 1 through 9 printed in green • 10 through 90 printed in blue • 100 through 900 printed in red • 1000 printed in green Place the box of numeral cards at the top of the rug. Place the UNIT cards in a vertical row to the right. Each is named as it is placed. "One UNIT, two UNITS, three UNITS." Place the TEN cards in a vertical row to the left of the units with corresponding spacing. Each is named as it is placed. "One TEN, two TENS, three TENS ... " Place the HUNDRED cards in similar manner to the left of the tens. "One HUNDRED, two HUNDREDS, three HUNDREDS ... " Place the THOUSAND card to the left of the hundreds. "One THOUSAND." Ask the student to bring varying cards of two, then three and finally four place values to the work rug. For example:	Student helps to sort and organize numeral cards in sequential order. Student reads and points to the numeral card with the teacher. Student identifies and brings the numeral cards asked by the teacher

	"Please bring the cards that say four UNITS, four TENS, four HUNDREDS, one THOUSAND." "Let's read what you brought: four UNITS, four TENS, four HUNDREDS, one THOUSAND." Show the student how to slide the cards to form a four digit numeral. "Let's do the magic slide and then read it the other way. One THOUSAND, four HUNDRED, four TENS, four UNITS."	Student reads the numeral card with the teacher
Informal Assessment	Have student randomly choose a numeral card from each place value. Teacher observes.	Have student build a four digit number and reads the number
Practice Activity Support	Ask the student to layout the Golden Beads on the work rug, just as how first demonstrated in the 9 Layout presentation. Ask student to layout the large numeral cards as presented before. *Teacher associates cards (concrete to abstract):* Ask the student to bring a specified quantity of beads from the bead display. The teacher brings the corresponding numeral cards from the card display. Put the quantities on the work rug with the units to the student's right. Count the units and associate the quantity with the unit numeral card. Continue with the rest of the quantities, associating the numerals as each quantity is counted. Slide the cards and read the four-digit numeral from left to right. *Student associates cards (concrete to abstract):* Ask the student to bring a specified quantity of beads from the bead display. Put the quantities on the work rug with the units to the student's right. Count the units and ask the student to bring the corresponding numeral card from the display. Continue with the rest of the quantities, with the student associating the numerals as each is counted. Slide the cards and read as before. *Teacher chooses cards, student associates beads (abstract to concrete):* The teacher puts a numeral card from each of the four place value on the bank tray and asks the student to place the corresponding bead quantities on the tray and bring both cards and beads to the work rug. Count and associate as before. Always verify what the student brings on the tray, placing the quantities and numeral cards in their proper order.	Students can recall and organize the Golden Beads and numeral cards in its place value order: units to the far right of the work rug, followed by the tens to the left of the units, hundreds to the left of the tens and one thousand cube to the left of the hundred square. Student gathers the correct amount of Golden Beads requested by teacher. Student gathers the correct amount of Golden Beads. Student gathers the correct numeral cards. Student reads aloud the numeral card placed on the bank tray. Student gathers the correct amount of Golden Beads. Student verifies amount by count aloud. Student stakes numeral cards and read them.
Closure Assessment of Student Voice	"Go to the bank and bring me back a quantity of Golden Beads. Can you tell me how much you brought? How many units? How many tens? How many hundred? How many thousands?" Ask the student to enumerate what s/he has brought (right to left)	Student is able to bring back the correct amount of Golden Beads and numeral card Student correctly enumerates the quantity from right to left.

	Ask the student to find the associated numeral cards. slide the cards so the separate numerals will combine to form one numeral	Student is able to find, stack and slide the numeral cards so that it forms one large numeral.
	Ask the student read this numeral (left to right).	Student is able to read the numeral from left to right.

Lesson 2: Forty-Five Layout

Lesson Part	Activity description/Teacher does	Students do

Title	Lesson 2: 45 Layout	
State Standard	CCSS.Math.Content.2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s. CCSS.Math.Content.2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	
Central Focus (CF)	To help the student gain familiarity with the quantities and their names.	
Learning Target (LT)	Students will associate quantities with the cards from 1 to 9000	
Academic Language	Becoming familiar with quantities (function), tens, hundreds, thousands, layout, unit, digit, quantities, hundred squares, zero	
Review	**Presentation Tray:** Introduction to the decimal system with the golden beads and numeral cards Tray with: one unit golden bead, a bar of ten golden beads, a square of one hundred golden beads, one cube of one thousand golden beads. Numeral cards: 1, 10, 100, 1000 Give standard 3 period lesson on one unite, one ten, one hundred and one thousand. Match the numeral cards with the golden beads.	Count how many beads are in a unit bead, in a ten bar. Count how many beads are in a bead bar Count how many bead bars are in a one hundred square Count how many one hundred squares are in a thousand cube. Match and identify the numeral card with the golden beads

| Instruction Inquiry | **Materials needed for 45 Layout:**
• 45 unit beads
• 45 ten bars
• 45 wooden squares
• 45 wooden cubes
• Large numeral cards, from 1 to 9000

"Today, we are going to count and order the Golden Beads [place value blocks] in columns. We will start with the smallest number and build up."

Bring the box of unit beads and place it at the top of the felt.
Place the unit beads first, starting from the farthest right, bottom corner of work rug [see instruction material for a visualization of presentation layout]. Say out loud as you place each unit bead down, "One UNIT." Place the unit numeral cards to the right of quantity, "One UNIT." Place the two unit beads above the one UNIT bead. Say, "two UNITS." Place the two unit numeral card to the right of quantity and say, "two UNITS." Continue to do the same all the way up to 9 UNITS.

Place the ten bars to the left of the unit beads, making sure to leave space for the numeral cards on the right hand side. "one TENS is 10, two TENS is twenty, three TENS is thirty…"
Continue placing the concrete materials and then the cards to 9000. | Unfold the place value felt on the work rug.

ONES place value are to farthest right of work rug.
Count and place the one unit bead on the felt. Student says, "One unit." Finds the corresponding numeral card and place it to the right of the quantity, "This is also one unit". Continue to do the same up to nine units.

TENS place value are to the left of the ONES place value
When counting the ten bars, bars are placed in horizontal rows. "One tens One tens is 'ten'." Student finds corresponding tens numeral card and place it to the right of the quantity. "This is also one tens. One tens is 'ten'." Continue to do to the same up to nine tens bard.

HUNDREDS place value are to the left of the TENS place value
When counting the hundred squares, stack them on top of each other, "One hundred square is 100." Student finds corresponding numeral card and place it to the right of the quantity, "This is also 100." Continue to do the same up to nine hundred squares.

THOUSANDS place value is to the left of the HUNDREDS place value
When counting the thousand cubes, stack them on top of each other, "One thousand cube is 1000." Student finds corresponding numeral card and place it to the right of the quantity, "This is also 1000." Continue to do the same up to nine thousand cubes. |
| **Informal Assessment** | Observe.

Point to a numeral card and ask, "What does this card say?"
Point to a quantity and ask, "How much is this? How do you know?" | Counts/ reads the number quantity.
For example, "That card says eighty. Eighty are eight ten bars together. There are eight ten bars, see… 1 ten bar, 2 ten bars, 3 ten bars…8 ten bars. And 8 ten bars make eighty!" |

Practice Activity Support	**Variation of 45 Layout: Vertical I** • 45 unit beads • 45 ten bars • 45 wooden squares • 45 wooden cubes • Large numeral cards, from 1 to 9000 "Today, we are going to count and order the Golden Beads [place value blocks] in columns. We will start with the lowest number and build up." Bring the box of numeral cards and place it at the top of the felt. Place the unit beads first, starting from the farthest right, bottom corner of work rug [see instruction material for a visualization of presentation layout]. Say out loud as you place each unit bead down, "One UNIT." Place the unit numeral cards to the right of quantity, "One UNIT." Place the two unit beads above the one UNIT bead. Say, "two UNITS." Place the two unit numeral card to the right of quantity and say, "two UNITS." Continue to do the same all the way up to 9 UNITS Place the ten bars to the above the UNITS, "one TENS is 10." Then place numeral card to the right of quantity. Place two ten bars above the one ten bar. "Two TENS is twenty," Place numeral card to the right of quantity. Continue placing the TEN bars and the associated numeral cards all the way up to 90, with the bars laying side-by-side. Place the hundred squares above the TENS. "one hundred. This is one HUNDRED," Then place numeral card to the right of the quantity. Place two HUNDRED squares above the one HUNDRED square. Make the sure the two HUNDRED squares are placed side-by-side. "two HUNDRED." Place numeral card to the right of the quantity. Continue placing the concrete materials and then the cards to 900 vertically. Continue to do the same with the thousand cubes.	Organize the numeral cards in sequential order on another rug. ONES place value is at the very bottom of the work rug. Count and place the one unit bead on the felt. Student says, "One unit." Finds the corresponding numeral card and place it to the right of the quantity, "This is also one unit". Continue to do the same up to nine units. TENS place value is placed above the ONES, starting with '10'. When counting the ten bars, bars are placed in vertical rows. "One tens One tens is 'ten'." Student finds corresponding tens numeral card and place it to the right of the quantity. "This is also one tens. One tens is 'ten'." Continue to do to the same up to nine tens bars. HUNDREDS place value is placed above the TENS, starting with '100'. When counting the hundred squares, place them flat, side by side, "One hundred square is 100." Student finds corresponding numeral card, "This is also 100," and places it to the right of the quantity. Continue to do the same up to nine hundred squares. THOUSANDS place value is placed above the HUNDREDS, starting with '1000'. When counting the thousand cubes, place them flat, side by side, "One thousand cube is 1000." Student finds corresponding numeral card, "This is also 1000." Continue to do the same up to nine thousand cubes.
Closure Assessment	Observe. Point to a numeral card and ask, "What does this card say?" Point to a quantity and ask, "How much is this? How do you know?"	Counts/ reads the number quantity. For example, "That card says three-hundred. Three hundred are three hundred squares together. There are 3 hundred squares here, see… 1 hundred square, 2 hundred squares, 3 hundred squares. And three hundred

		squares make 300!"
Practice Activity Support	**Vertical II:** • 45 unit beads • 45 ten bars • 45 wooden squares • 45 wooden cubes • Large numeral cards, from 1 to 9000 Same as Vertical I, except for the hundreds and thousands are stacked one on top of the other, instead of side-by-side.	Unfold the place value felt on the work rug. ONES place value are at the very bottom of the work rug. "I want to put the numeral cards first and then the beads." Count and place the one unit bead on the felt. Student says, "One unit." Finds the corresponding numeral card and place it to the right of the quantity, "This is also one unit". Continue to do the same up to nine units. TENS place value is placed above the ONES, starting with '10'. When counting the ten bars, bars are placed in vertical rows. "One tens One tens is 'ten'." Student finds corresponding tens numeral card and place it to the right of the quantity. "This is also one tens. One tens is 'ten'." Continue to do to the same up to nine tens bard. HUNDREDS place value is placed above the TENS, starting with '100'. When counting the hundred squares, stack them on top of each other, "One hundred square is 100." Student finds corresponding numeral card and place it to the right of the quantity, "This is also 100." Continue to do the same up to nine hundred squares. THOUSANDS place value is placed above the HUNDREDS, starting with '1000'. When counting the thousand cubes, stack them on top of each other, "One thousand cube is 1000." Student finds corresponding numeral card and place it to the right of the quantity, "This is also 1000." Continue to do the same up to nine thousand cubes.

	Observe.	Student reads/ counts the number.
Closure Assessment of Student Voice	"Wait a minute. I noticed that the thousand cubes for 8000 and 7000 are the same height. Can you count and check your work?"	"Ok. Let's count. 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000. That's not right. It supposed to be 7000". Student takes one away, "Ok, . 1000, 2000, 3000, 4000, 5000, 6000,7000. Now that is 7000. Let's check to see if we have 8000. 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000. Yup, that's 8000."
	What do you notice about the numbers of each place value?	"The beads get more and more and you go up and up and up. You just keep on adding 'one more' to each place value to make the number go in order."
	What do you mean by 'one more'?	"Well, like you have one hundred square, then you have two of them, then you have three of them and then you have four of them. And the numeral cards go 1,2,3,4 with zeroes behind them. First you have no zeroes, then one zero, then two zeroes, then three zeroes."

Lesson 3: Golden Beads Addition

Lesson Part	Activity description/Teacher does	Students do

Title	Lesson 3: Golden Beads Addition	
State Standard	CCSS.Math.Content.2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. CCSS.Math.Content.2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations. CCSS.Math.Content.2.NBT.B.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.	
Central Focus (CF)	To help the student gain familiarity with the quantities and their names.	
Learning Target (LT)	To experience the addition operation of *adding together* different small quantities to form one larger quantity.	
Academic Language	Becoming familiar with quantities (function), tens, hundreds, thousands, layout, unit, digit, quantities, hundred squares, add	

Review	**Go Fetch**	- Student reads the numeral card
	- The decimal card layout is on one rug and a second rug is nearby. - Place a card from each place value on a tray with the thousand card in the upper right hand corner, the hundred card below it, then the ten, and unit cards next to each other and below the hundred card. - Student fetches quantity. - Tell the student that you are going to "do magic" with the number cards. Form 1 number with the separate cards by placing the unit card on top of the ten, on top of the hundred, on top of the thousand, with the left edges even and 3 zeroes showing. Then slide the cards over to reveal 4 numerals. Read the number. Ask the student to return the cards to the layout and the beads to the bank.	-The student fetches the quantities from the bank and brings them to the empty rug. -Place the thousand card on the left-hand side of the rug, read it, and count out the thousand cubes below it. -Place the hundred card to the right of the thousand card, read it, and count out the hundred squares below it. -Same procedure with the tens and then units.
Instruction Inquiry	**Bank Game: Addition with the Golden Beads** Invite 3 students to this group activity: one is identified as the banker. Introduce the four boxes of quantities on the shelf as the bank. "Today, we will use the Beads to add. We will create two addend, to find the sum. When you see this symbols '+', it means to add. When you see this symbol '=', it means equal." Tell the banker, "Please layout the large numeral cards in order, in vertical columns of units, tens, hundreds and thousands with the unit cards on the farthest right of the work rug." Then to open the bank and wait for the other three students to come with their trays. Tell the other 2 students, "Please layout the small numeral cards on a board in vertical columns of units, tens, hundreds and thousands, with the units farthest to the right of the rug." At each student's small numeral card display, select a card from each place value and place it on the student's tray, for example the cards that say 4 units, 2 tens, 1 hundred, 3 thousands. *Be sure the number does not require regrouping when combined with the cards on the other students' trays.* Tell each student: "Go the bank and tell the banker what you need." Count the quantities with the first student, associating them with the small numeral cards on the tray as in the previous activities (units to the student's right, then tens, hundreds and thousands).	Banker lays out the numeral cards in sequential order according to its place value. 2 students (the clients) arranges the numeral cards in sequential order according to its place value. Student asks Banker, "Can I please have 4 units, 2 tens, 1 hundred, 3 thousands." The *Banker* gives correct amount of Golden Beads to the *client 1*. The *client 1* verifies the amount given by the *banker*. *Client 1* sorts the Golden Beads by its place value on the place value mat, starting with the unit beads first.

	Place the numeral cards under the quantities in each place value. Ask the student to slide the cards, read together the numeral from left to right, and place the four-digit numeral to the right of the units. Proceed to do the same with the quantities and cards brought by the other student, *client 2*, thus establishing two addends. Now begin the addition operation. "Let's see what we have when we *add*, or *put together* these two quantities. First we will *add* all the units." Gather all the unit beads and place it below the equation line. Continue to do the same for the other place values	Verify the quantities by counting them together with the student at the work rug. Student says, "I have 3,124." Student slides all the unit beads and bring it below the equation bar Count the quantity
Informal Assessment	What did we get when we added these two quantities together? What does "add" mean? What does "sum" mean	Student counts all the beads. Student gets the corresponding big numeral card to represent the sum of the addends. When counting the quantities, the units are placed to the student's right and the tens, hundreds and thousands are placed to the left in a horizontal row. Take the quantities back to the display before bringing another quantity. Student says, "Add means putting two addends together." Student says, "Sum means the answer.
Practice Activity Support	Work with peer, independent of teacher. Student chooses addition equation cards that doesn't require regrouping. Writes equation down on grid paper	
Closure Assessment	Observe Ask students to read the equation and answer they have written on the grid paper..	Read equation and answer

Formal Postassessment (*Sequence end*)	What does it mean to 'add'? Which number is the *addend*? Which number is the *sum*? Can you tell me how you come up with the sum? Can you name all the place values?	