Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: Subitizing with dot arrange-ments	*Seeing the patterns of numbers spatially allows students to build instant recognition of numbers.*	**Grouping:** Whole or Small **Materials:** dot arrangements **Progression:** In order to build confidence, start with easy and familiar patterns of numbers like ones seen on dice (0-5). Move to larger quantities and different arrangements as students become fluent in recognition of quantities 0-5. **Procedure:** • Hold up a dot card for 3-4 seconds. • Ask: How many dots they saw? • Think-Pair-Share • Share out • Ask: How did you count so quickly? • Think-Pair-Share • Share out • Repeat with different arrangements **Extension:** Hold up a two dot cards for 3-4 seconds. Ask students to mentally combine dot arrangements. They should give the sum and justify their answer.	*Number Sense Routines: Building Numerical Literacy Every Day in Grades K-3,* Jessica F. Shumway

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: Subitizing with frames	*Five frames help students create a visual model for quantities five or less.* *Ten frames help students create a visual model for quantities ten or less and continue to develop the anchor of five.* *Double ten frames help students create a visual model for quantities 10-20 using anchors of five and ten.*	**Grouping:** Small or Whole Group **Materials:** Frames showing quantities different arrangements **Progression:** Five Frames Ten Frames Double Ten Frames (teen numbers) Double Ten Frames (mentally combining quantities) **Procedures:** • Show the frame for 3-4 seconds. • Ask: How many dots they saw? • Think-Pair-Share • Share out • Ask: How do they know? • Think-Pair-Share • Share out • Repeat with different arrangements	*Number Sense Routines: Building Numerical Literacy Every Day in Grades K-3,* Jessica F. Shumway
Number Sense: Choral Counting	*Fluency in counting is essential in building number sense.* *Students need frequent short practices with counting skills.*	**Grouping:** Small or Whole Group **Materials:** number chart **Procedures:** • Chorally count any number pattern to build fluency	*Number Sense Routines: Building Numerical Literacy Every Day in Grades K-3,* Jessica F. Shumway

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: Count around the circle	*This counting routine will help students develop an understanding of counting patterns, place value, and estimation. It will increase their success with all operations, mental math and problem solving. Using an open number line along with this routine will help students create a mental image of a number line. Using a number chart with this routine will help students understand patterns in our number system.*	**Grouping:** Small or Whole Group **Materials:** number chart, open number line, small object to pass around the circle **Procedures:** • Decide on a pattern for counting • Make an estimate of the number you will land on when you make it around the circle once, twice, halfway etc. • One student says the first number • Students individually say successive numbers as you move around the circle • Have an open number line or number chart to support students when they are stuck **Sample Counting Patterns:** • Forward by 1's, 10's, 5's, 2's, 3's, 4's, 100's etc. • Count backwards by 1's, 10's, 100's, • Give a start and/or stop number • Count by 10s to a certain number, then by ones • Count by fractions (1/4, 2/4, ¾…) • Count by decimals(.2, .4, .6, .8, 1…) • Create your own variations	*Number Sense Routines: Building Numerical Literacy Every Day in Grades K-3,* Jessica F. Shumway

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: Counting up and back	*Fluency in counting is essential in building number sense.* *Students need frequent short practices with counting skills.*	**Grouping**: Whole Group **Procedure**: • Have five students stand in front of a row of chairs • The class chorally counts each student The students sit as they are counted • When the target number (5) is reached, the child who sat on five, stands up again and is counted as 5. • The child before him stands and is counted as 4, etc. • 1, 2, 3, 4, 5, 5, 4, 3, 2, 1. **Extension:** Repeat with different target numbers.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 40

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: One-to-one correspondence/ Cardinality *Counting Sets*	*Students need experience counting sets of objects in order to build number sense.* *As students become more comfortable counting sets, they will develop automaticity of matching the visual with the quantity.*	**Grouping**: Small or Whole Group **Materials:** dot cards, dot plates, dice, counters, cubes, ten frames, etc. **Procedure**: • Teacher models counting a set • Students chorally count sets • Ask: How many? • Students chorally respond with the total quantity **Small Group Procedures:** Students have a set in front of them and use one to one correspondence if needed to count the set. Check for understanding Students explain **Extension**: When students have good number sense with 0-5, continue to 10, 15, 20.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 38

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: One-to-one correspondence/ Cardinality *Making Sets*	*Students need experience with making sets of objects. This will allow them to get a sense of quantity.* *Repeated practice of this strategy is essential to building number sense.* *As students become more comfortable with making sets, they will be able to change the quantity without recounting.*	**Grouping**: Whole Group / Small Group **Manipulatives:** counters, chips, pennies, cubes, paperclips, etc. **Math Mat:** can be a whiteboard, laminated construction paper, tray, ten frame, etc. **Procedure**: • Model making sets of numbers 0-5 on your math mat with manipulatives. • Have students practice making same set on their math mat. • Continue making different sets "Show me what 2 looks like." "Show me what 0 looks like." Continue with various numbers 0-5. Be sure to have some discussions about how students made their sets. **Extension**: When students have good number sense with 0-5, continue to 10, 15, 20.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 38

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| Instructional Strategies	Description	Examples	Resource
Number Sense: Hierarchical inclusion by building one more and one less	*Students need to be able to manipulate numbers and see their relationship between other numbers.* *Ex: 7 is 1 more than 6 and 2 less than 9*	***Grouping:*** *Whole or Small Group* ***Manipulatives:*** *dominos, dot cards, numeral cards* ***Procedure:*** *Use dominoes and play the usual way but instead of matching the ends, a new domino can be added if it has an end that is one less than the end on the board.* *This can also be done with one more, two less and two more.* ***Alternate Procedures:*** *Give students about six different dot cards.* *The students will then need to construct a set of counters that is two more than the set shown on the card* ***Alternate Procedures:*** *Similarly, spread out eight to ten dot cards and the students will need to find another card for each that is two less than the card shown.* ***Extension:*** *Teacher can mix in dot cards and numeral cards.* *Students can also be encouraged to take turns reading the number sentence to their partner.* *Example: "Two more than four is six."*	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 44

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Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: Counting on with counters	*Students need frequent experiences starting with numbers other than one when counting.*	**Grouping**: Small or whole Group **Procedure**: • Hide a number of counters in your hand. • Place more counters in a line next to your hand. • Have students practice counting up by saying the number of counters in your hand and then count the extra counters. **Example:** 3 4..... 5 Do this with different target numbers.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 41

Instructional Strategies	Description	Examples	Resource
Number Sense: Part-Part-Whole relationships Part-Part-Whole relationships (cont.)	*Students need to understand that there are different number combinations (parts) that make up a number (whole).* *This is called a part-part-whole relationship.* *This is a great strategy for the make ten facts.*	**Grouping:** Small or Whole Group **Manipulatives:** mat, two sided counters, unifix cubes, dot strips, two column strips, etc. **Procedure:** • Students should have one set of manipulatives (cubes, counters, etc.). • Their job is to see how many different combinations for a certain number they can make using two parts. • Students should display each different combination on their mat. • Ask students to then read their number sentence that goes with their combination. **Extension:** This is called 2 out of 3. Make a list of three numbers: two of which total the whole that the students are focusing. Examples for 5: 2-3-4 , 5-0-2, 1-3-2, 3-1-4, 2-2-3, 4-3-1 The students should choose the two numbers that make the whole and justifying their answer.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 48

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Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource

Number Sense: Missing Parts	*The missing part can be found with the relationship between the other part and the whole.*	**Grouping:** Whole or small group
		
		Manipulatives: counters, cup, missing part cards
		
		Procedure: First count out the amount you are focusing on so the students know the whole. Next, cover up any part of that whole.
		
		Prompt the students to automatically say the number sentence.
		
		Example: If 5 is the whole and only 2 are showing the student should say 2 and 3 is 5.
		Extension: I wish I had:
		    Show (with any manipulative) dots showing less than a target number.
		Say, "I wish I had (the target number)"
		
		Students should respond with the amount needed to make the target number.
		"You need (missing part) more."
		
		Example:
		    Teacher: *"I have **4**, I wish I had **6**."*
		
		Students: *"You need **2** more."*
			Teaching Student-Centered Mathematics Grades K-3, John A. Van de Walle Page 50

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

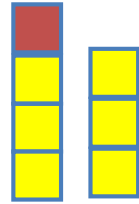| Instructional Strategies	Description	Examples	Resource
Number Sense: *Number Stories for addition and subtraction*	*It is important for students to build number sense through number stories. This should be done without attaching the numbers, symbols and operations at first.* *Tell number stories to your students and have them use manipulatives, act it out, and/or draw it.* *Be sure to make the stories fun and interesting in order to hold their attention.*	**Grouping**: Whole Group or Small Group **Manipulatives:** counters, chips, pennies, cubes, paperclips, paper, crayons, etc. **Procedure**: Tell a number story, and model your thinking as you figure out the answer. Lisa's dog ate two treats. She gave him one more. How many does he eat now? *"I know the dog ate two then one more. I think my answer will be more than two. If I put two blocks to represent the treats and add one more that makes 3."* Continue with number stories having students work to find the answer. Students should partner share their answer and reasoning. **Extension**: As students become proficient with this, challenge them to do the math in their head for sums and differences 0-5.	

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: Anchoring Numbers to 5 and 10 Anchoring Numbers to 5 and 10 (cont.)	*Students need to relate a given number to other numbers.* *This relationship is key when students are developing number combinations.*	**Grouping:** whole or small **Manipulatives:** five frame, ten frame *Important to use five frame if students have not yet been exposed to ten frame. **Procedure:** • All children have their own ten frame (or five frame). • The teacher will call out a random number. • After each number, the students will need to change their frame to show the new number. • Look for students who are wiping off their whole frame, compared to those who know to just add or subtract a few. • Encourage discussion about adding or removing to change the frame rather than wiping it clean. **Extension:** Use Ten Frame Flash Cards Flash the cards and have students identify the number chorally. **Variations:** • Have students say the number of empty spaces on the card instead of the number of dots. • Have students say a number that is one more (two more, one less, two less) than the number of dots. • Have the students say the "ten fact" based on the number of dots on the ten frame. Example: "six and four make ten" 	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 46

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

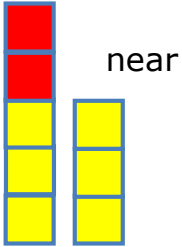| Instructional Strategies	Description	Examples	Resource
Number Sense: Doubles	*Students need to develop fluency with their doubles facts.* *This will build a foundation for using doubles facts as anchors for other number combinations such as doubles plus 1 or doubles plus 2.*	**Grouping:** whole or small **Manipulatives:** picture cards (for each double) that can be used to create word problems **Procedure:** • Show students the picture cards. • Students use the picture card to create a word problem. **Example:** *Alex and Zack each found 7 seashells at the beach. How many did they find together?*	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 101

Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

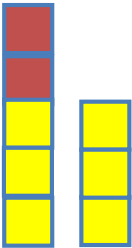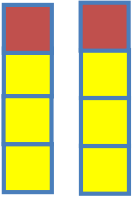| Instructional Strategies	Description	Examples	Resource
Using Related Facts: *Doubles Plus One*	*After students have a good foundation of doubles.* *Includes all combinations where one addend is one more than the other.* *The strategy is to double the smaller number and add one.* *Students need to be able to match the near double with the double.*	Near Double Double 4 + 3 3 + 3 **Procedures:** Use linking cubes to show near doubles This will illustrate the concept of double plus one. Make the doubles fact one color and the plus one portion different color. **Extension:** • Show student a list of near doubles and have them circle the smaller quantity • Students double the smaller quantity and record it under the number. • Students add one more and write the answer. 5 + 4 = 9 **Variation:** • Follow same procedures but double the larger quantity and subtract one. **Note:** As students become proficient you want to move them into the abstract by having them visualize this in their head.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 101-102 *Teaching Student-Centered Mathematics Grades 3-5,* John A. Van de Walle Page 81

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Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: Doubles plus 1	*Doubles plus one will allow students to build upon the anchor of doubles when faced with other number combinations.*	**Grouping:** whole or small **Manipulatives:** equation cards with doubles, equation cards with doubles plus 1 **Procedure:** Have students spread out the double equation cards. Once all cards are down have students pick up the doubles plus one equation cards and place each equation card over the double fact that helps.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 102

Instructional Strategies	Description	Examples	Resource

Using Related Facts: Doubles Plus Two	Similar to Doubles Plus One
	
	After students have a foundation of doubles and doubles plus one.
	
	Includes combinations where one addend is two more than the other.
	
	Students need to be able to match the near doubles with the double.
		Near Double Double
		   5 + 3 3 + 3
		
		Use linking cubes to show near
		doubles.
		
		This will illustrate the concept of doubles plus one.
		
		Make the doubles fact one color and the plus two portion different color.
		
		Show student a list of near doubles and have them circle the smaller number.
		
		They should double it and write it under.
		
		Finally they would add one to write the answer
		6 + ④ = 10
		       8
		
		As students become proficient you want to move them into the abstract by having them visualize this in their head.
			Teaching Student-Centered Mathematics Grades K-3, John A. Van de Walle Page 105

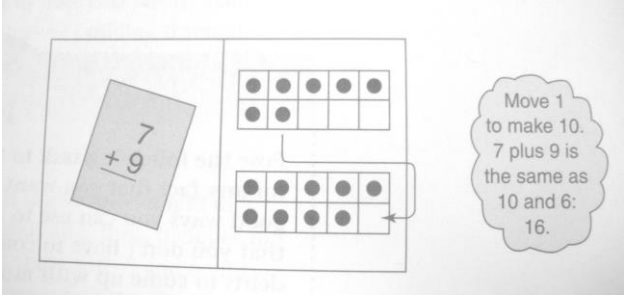| Instructional Strategies	Description	Examples	Resource
Using Related Facts: Two Apart Facts	*Similar to Doubles Plus Two* *After students have a foundation of doubles and doubles plus one.* *Students need to be able to decompose numbers.* *Includes combinations where one addend is two more than the other.* *You double the number between the two addends.*	Near Double Double New Double 5 + 3 3 + 3 4 + 4 = 8 As students become proficient you want to move them into the abstract by having them visualize this in their head.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 103

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Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Number Sense: Anchor of ten Making 10	*Students can use the anchor of ten to help solve equations that have larger numbers.*	**Grouping:** whole or small **Manipulatives:** ten frames, equation cards (flash cards) **Procedure:** Give students two ten frames Place the flash cards face down next to the ten frames (or you can orally give the fact). Students need to first model each number on the two ten frames and then decide on the easiest way to show the number (do not allow counting). The goal is to have students move some of the counters to make a whole ten frame and put the remainder on the other ten frame. Focus on making that ten. Example: Students could move one from 8 to make ten or could move 2 from 9 to make ten. When first doing this activity focus only on equations with 9s and 8s until they get the concept of trading a couple to make ten. **Extension:** You can use the same concept with subtraction flash cards. Making sure once again to start to equations using 8 and 9. Having students make ten in a frame first.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 101-102 *Teaching Student-Centered Mathematics Grades 3-5,* John A. Van de Walle Page 81

Instructional Strategies	Description	Examples	Resource
Using Related Facts: Make Ten	*Students need to know how to combine any single digit number with 10 (10 + 5 =15).* *Works well with addends of 8 and 9.* *Students need to know how to compose and decompose numbers.* *Take what is needed from the smaller number to make the larger number 10 and add the leftovers to find the sum.*	Below is an example of how to visually show the students what you are doing As students become proficient you want to move them into the abstract by having them visualize this in their head.	*Teaching Student-Centered Mathematics Grades 3-5,* John A. Van de Walle Page 105
Using Related Facts: Make Ten and extend	*Students need to know how to combine any single digit number with 10 (10 + 5 =15).* *Works well with 7 and 5 as an addend.* *Students need to know how to compose and decompose numbers. Take the amount you need to make 10 and add the leftovers.*	Similar to photo above but with 7 or 5. For example: 7 + 5 could be done by taking 3 from the 5 to make 10 and adding the leftover 2 to equal 12. 7 + 5 could also be done by taking 5 from the 7 to combine with the other 5 to make 10 and adding the leftover 2 to make 12.	*Elementary and Middle School Mathematics: Teaching Developmentally 7th Edition,* John A. Van de Walle Page 176

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Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Using Related Facts: The Generic Task	*Students are posed with a fact. They then discuss with a partner a strategy used to solve the fact. The strategy is shared with the class.* *Encourage students to find multiple ways to solve the fact. Use the think, pair, share approach. This method gives every student the message that his or her idea is okay.*	If you do not know the answer to 8 + 5, what are some efficient ways to get to the answer? Efficient means you don't have to count and you do it in your head. Possible Answer: *Making ten by adding 8 + 2 then adding the remaining 3*	*Teaching Student-Centered Mathematics Grades 3-5,* John A. Van de Walle Page 46
Using Number Sense: Reasonableness	*Students should be taught and expect to think about the reasonableness of their answer.* *They should be asked to defend the reasonableness of their answers on several occasions.*	Does it make sense? Is this reasonable? Is the sum greater than the two addends?	
Commutative Property	*The order of the addends does not change the sum.*	7 + 8 = 15 8 + 7 = 15 Teach students that by understanding the commutative property they only have to master 55 of the 100 addition facts.	

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Number Sense Instructional Strategies for Teaching Addition
Kindergarten- Second Grade

Instructional Strategies	Description	Examples	Resource
Using Related Facts for Subtraction	*Think Addition is the most efficient way to teach subtraction.* *Teach students to think of the missing part or addend in the related addition fact.*	14 – 9 = _____ Think 9 + what number = 14 The answer is 5.	*Teaching Student-Centered Mathematics Grades K-3,* John A. Van de Walle Page 101-102 *Teaching Student-Centered Mathematics Grades 3-5,* John A. Van de Walle Page 81