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| **Prerequisite Skills** | **Unit Six Standards**  **Grade 2** | **Looking Ahead**  **(Grade 3)** |
| Foundational Facts:  +1/+2, +0, +10, Doubles, Making 10, Using 10s, Using Doubles (Unit 1). | Operations and Algebraic Thinking 2: **Fluently** add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.   * I can fluently add within 20 using mental strategies. * I can fluently subtract within 20 using mental strategies.   **\*This standard must only be taught in small group/centers in Unit 3 depending on student need.** | Solve problems involving the four operations, and assess the reasonableness of answers using mental computation. |
| Understand and apply properties of operations and the relationship between addition and subtraction.  Add and subtract within 20.  Use place value understanding and properties of operations to add and subtract.  Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. | Number and Operations in Base Ten 5: **Fluently** add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.   * I can fluently add 2-digit numbers using strategies. * I can fluently subtract 2-digit numbers using strategies. | Use place value understanding and properties of operations to perform multi-digit arithmetic.  Use place value understanding to round whole numbers to the nearest 10 or 100.  Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. |
| Number and Operations in Base Ten 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 ten, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.   * I can solve problems within 1000 using addition and subtraction. |
| Number and Operations in Base Ten 9: Explain why addition and subtraction strategies work, using place value and the properties of operations.   * I can explain what strategy I used to solve my problem. |

\*In standards that are repeated in several units, the I Can Statements represent a progression of skills to scaffold learning.

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Operations and Algebraic Thinking 2:  **Fluently** add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. | * I can fluently add within 20 using mental strategies. * I can fluently subtract within 20 using mental strategies. |   **\*This standard must be practiced in small group/centers in Unit 6 depending on student need.**   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | | | | | Second Graders internalize facts and develop fluency by repeatedly using strategies that make sense to them. This standard mentions the word fluently when students are adding and subtracting numbers within 20. Fluency means accuracy (correct answer), efficiency (within 4-5 seconds), and flexibility (using strategies such as making 10 or breaking apart numbers). Research indicates that teachers’ can best support students’ memorization of sums and differences through varied experiences making  10, breaking numbers apart and working on mental strategies, rather than repetitive timed tests. | | | | | | | | **Foundational Facts** | | | | | | | | **+1/+2** | **+0** | **+10** | **Doubles** | **Making Ten** | **Using Tens** | **Using Doubles** | | Deryn took 5 bites of an apple. Then she took 1 more bite. How many bites did she take? | 4 boys were at the math center. No girls were at the math center. How many students were at the math center? | If your cookie had 4 chips, how many chips would your cookie have if you added 10? | His pigs are very muddy. He uses 3 bars of soap to bathe them. How many bars of soap will he use if we double the pigs? | There were 10 apples in the basket. What if you dropped 3? How many apples are left? | Yesterday, Farmer Brown gathered 9 eggs from the hen house. Today, he gathered 4 more. How many eggs did he gather all together? | There were 5 spotted fish and 6 fantail fish. How many fish were there altogether? |  |  |  |  |  | | --- | --- | --- | --- | | **Lessons and Resources for Operations in Algebraic Thinking 2** | | | | | Grade 3 Unit 3 Inv 3 (3.2-3.7) | |  | | | Mastering the Basic Facts in Addition and Subtraction: [Chapter 2: Plus 1 and Plus 2](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/2nd%20Grade/Chapter%202%20Plus%201%20Plus%202.pdf) | Mastering the Basic Facts in Addition and Subtraction: [Chapter 3: Adding 0](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/2nd%20Grade/Chapter%203%20Adding%200.pdf) | Mastering the Basic Facts in Addition and Subtraction: [Chapter 4: Adding 10](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/2nd%20Grade/Chapter%204%20Adding%2010.pdf) | Mastering the Basic Facts in Addition and Subtraction: [Chapter 5: Doubles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/2nd%20Grade/Chapter%205%20Doubles.pdf) | | Mastering the Basic Facts in Addition and Subtraction: [Chapter 6: Making 10](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/Basic%20Fact%20Books%20O%27Connell/Addition%20and%20Subtraction/Chapter%206%20Making%2010.pdf) | Mastering the Basic Facts in Addition and Subtraction: [Chapter 7: Using 10s](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/2nd%20Grade/Chapter%207%20Using%2010s.pdf) | Mastering the Basic Facts in Addition and Subtraction: [Chapter 8: Using Doubles](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/2nd%20Grade/Chapter%208%20Using%20Doubles.pdf) | [CGI – Addition and Subtraction Story Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/2nd%20Grade/CGI%20Addition%20and%20Subtraction%20Story%20Bank.docx) |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively2.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure2.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning3.html) | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations in Base Ten 5:  **Fluently** add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. | * I can fluently add 2-digit numbers using strategies. * I can fluently subtract 2-digit numbers using strategies. |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | | | There are various strategies that Second Grade students understand and use when adding and subtracting within 100.  **The standard algorithm of carrying or borrowing is neither an expectation nor a focus in Second Grade**.  **Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.** Students should have experiences solving problems written both horizontally and vertically. They need to communicate their thinking and be able to justify their strategies both verbally and with paper and pencil. | | | | | | **Possible Strategies** | | | | | | **Place Value Strategy**  67 + 25 =  I broke both 67 and 25 into tens and ones. 6 tens plus 2 tens equals 8 tens. Then I added the ones. 7 ones plus 5 ones equals 12 ones. I then combined my tens and ones. 8 tens plus 12 ones. | **Counting On and Decomposing a Number Line Leading to Ten**  67 + 25 =  I wanted to start with 67 and then break 25 apart. I started with 67 and counted on to my next ten. 67 plus 3 gets me to  70. I then added 2 more to get to 72. I then added my 20 and got to 92. | **Commutative Property**  67 + 25 =  I broke 67 and 25 into tens and ones so I had to add 60+7+20+5. I added 60 and 20 first to get 80.  Then I added 7 to get 87. Then I added 5 more.  My answer is 92. | **Relationship between Addition and Subtraction**  63 – 32 =  I broke apart both 63 and 32 into tens and ones. I know that 2 plus 1 equals 3, so I have  1 left in the ones place. I know that 3 plus 3 equals 6, so I have a 3 in my tens place.  My answer has a 1 in the ones place and 3 in the tens place, so my answer is 31. | **Other Possible Strategies:**   * Incremental adding * Compensation * Adding up * Incremental subtracting * Subtracting by place value * Associative Property * Identity Property of 0 |  |  |  | | --- | --- | | **Lessons and Resources for Number and Operations in Base Ten 5** | | | Grade 3 Unit 3 Inv 1,2,3,4 |  |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively2.html) | [6. Attend to precision](http://elementarymath.dmschools.org/6-attend-to-precision2.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure2.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning3.html) | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations in Base Ten 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 ten, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. | * I can solve problems within 1000 using addition and subtraction. |  |  |  |  | | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | This standard 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. Students should have ample experiences using concrete materials and pictorial representations to support their work.  **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 a standard algorithm until the end of Fourth Grade.** | | | | **Possible Strategies** | | | | **Student A**  354 – 287 =  This student uses a number line. ―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 7 and landed on 641.‖ | **Student B**  354 – 287 =  This student uses base ten blocks & mat. ―I broke all of the numbers up by place value using a place value chart. I first added the ones (4 + 7), then the tens (50+80) and then the hundreds (200 = 500) I then combined my answers: 500 + 130 = 630. 630 + 11 = 641‖. | **Student C**  354 – 287 =  This student uses 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 11 ones. |  |  |  | | --- | --- | | **Lessons and Resources for Number and Operations in Base Ten 7** | | | Grade 3 Unit 3 Inv 1,2,3,4 |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively2.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics1.html) | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically2.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure2.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning3.html) | |

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| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations in Base Ten 9:  Explain why addition and subtraction strategies work, using place value and the properties of operations. | * I can explain what strategy I used to solve my problem. |  |  |  | | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | This standard calls for students to explain using concrete objects, pictures and words (oral or written) why addition or subtraction strategies work. The expectation is that students apply their knowledge of place value and the properties of operations in their explanation.  Students should have the opportunity to solve problems and then explain why their strategies 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 and then added them. 30 + 6 + 20 + 5. I can change the order of my numbers, so I added 30+20 and got 50. Then I added on 6 to get 56. Then I added 5 to get 61. This strategy works because I broke all the numbers up by their place value. | **Student B**  I used place value blocks and made a pile of 36. Then I added 25. I had 5 tens and 11 ones. I had to trade 10 ones for a 10. Then I had 6 tens and 1 one. That makes 61. This strategy works because I added up the tens and then added up the ones and traded if I had more than 10 ones. | | **Students could also have experiences examining strategies and explaining why they work. Also include incorrect examples for students to examine. Operations embedded within meaningful context promote development of reasoning and justification.** | | | **Example A**  One of your classmates solved the problem 56 - 34 = \_\_ 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 20 to get to 50. So, the answer is 22.‖ Is their strategy correct? Explain why or why not? | **Example B**  One of your classmates solved the problem 25 + 35 by adding 20 + 30 + 5 + 5. Is their strategy correct? Explain why or why not? |  |  |  | | --- | --- | | **Lessons and Resources for Number and Operations in Base Ten 9** | | | Grade 3 Unit 3 Inv 1,2,3,4 | [CGI – Addition and Subtraction Story Bank](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/2nd%20Grade/CGI%20Addition%20and%20Subtraction%20Story%20Bank.docx) |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively2.html) | [3. Construct viable arguments and critique the reasoning of others.](http://elementarymath.dmschools.org/3-construct-viable-arguments-and-critique-the-reasoning-of-others1.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics1.html) | | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically2.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure2.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning3.html) | |

**Optional Whole Group Lesson Progression**

Unit Pacing: 5 weeks

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| **Resource** | **Location** | **Primary Focus** | **Standard** |
| Investigations | Grade 3 Unit 3   * Inv 1 and 2 | * I can fluently add 2-digit numbers using strategies. * I can solve problems within 1000 using addition and subtraction. * I can explain what strategy I used to solve my problem. | 2.NBT.5  2.NBT.7  2.NBT.9 |
| Investigations | Grade 3 Unit 3   * Inv 3 (3.2 – 3.7) | * I can fluently add within 20 using mental strategies. * I can fluently subtract within 20 using mental strategies. * I can fluently subtract 2-digit numbers using strategies. * I can solve problems within 1000 using addition and subtraction. * I can explain what strategy I used to solve my problem. | 2.OA.2  2.NBT.5  2.NBT.7  2.NBT.9 |
| Investigations | Grade 3 Unit 3   * Inv 4 | * I can fluently subtract 2-digit numbers using strategies. * I can solve problems within 1000 using addition and subtraction. * I can explain what strategy I used to solve my problem. | 2.NBT.5  2.NBT.7  2.NBT.9 |

**\*Unit pacing is approximate. Some lessons may take more than one day. Use teacher discretion based on student need when planning unit length.**