Bundle Up

TEKS Student Expectation:
The student is expected to use concrete models to represent, compare, and order whole numbers (through 999), read the numbers, and record the comparisons using symbols and numbers (\(<\), \(>\), =). (2.1)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td></td>
<td>Make It Equal</td>
</tr>
<tr>
<td>• 110 or more straws (or craft sticks, pipe cleaners, etc.)</td>
<td>• Bundles</td>
<td>12 - □ = 2 + 3</td>
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<td>• Rubber bands</td>
<td>• Groups of ten</td>
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<td>• Value</td>
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<td>• Place value</td>
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<td>• Digit</td>
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<td>• Counting on</td>
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</table>

Activity: Today we will bundle or group objects into tens and then use the bundles to build larger numbers. We are making groups of 10 because place value in our number system is based on tens.

Part 1 -- Making bundles of ten

1. The teacher puts out a supply of straws and says: Each straw is worth one. We are going to make bundles of ten straws. (Model making a bundle of 10 and securing it with a rubber band.)

2. The students bundle the straws into groups of ten. (The group will need at least 10 bundles and 10 loose straws.)

Part 2 -- Combining and counting bundles of ten

1. The teacher puts two bundles together and asks:
   - If one bundle is worth ten, what is the value of two bundles? How did you know?
   - Did you have to count each straw? Why? (Since the straws are in groups of ten, you can count by ten.)

2. The teacher continues adding one bundle at a time and counting by 10’s until there are 10 bundles, or 100 straws. (10, 20, 30, …)

3. The teacher asks questions to build understanding of place value, such as:
   - What is the value of 4 bundles of 10 straws? How do you know?
   - How many groups of 10 does it take to make 30? 70? How do you know?
   - How many straws are in 10 bundles? How do you know?
Bundle Up

Part 3 -- Modeling how to use bundles of tens and ones to represent a number

1. The teacher says: Now we are going to use the bundles of 10 straws to make some other numbers.

2. The teacher writes a number (for example 36), and thinks out loud as she/he models representing it: I can make thirty using three bundles of ten. 10, 20, 30. Then I'll count on using individual straws until I get to 36. … 31, 32, 33, 34, 35, 36. I can make 36 using three bundles of ten and six individual straws.

3. The teacher asks questions such as:
   - How many bundles of ten straws did it take to make 30? (3)
   - In the number 36, which digit shows the number of bundles of 10? (3, the number in the tens place)
   - What is the value of the 3 in 36? (30, 3 tens)
   - Which digit in 36 shows the number of individual straws? (the 6, the digit in the ones place)
   - What does the 6 mean in 36? (6 ones)
   - What does it mean when we say 36 = 30 + 6?

Part 4 -- Using bundles to represent numbers

1. Students take turns. They choose a number between 10 and 99. The teacher writes the number, and the student counts by 10’s and counts on as he/she represents the number with the straws. (If no student chooses a multiple of ten as their number, be sure to include one to emphasize the function of zero in place value.)

2. The teacher continues to ask questions such as those in Part 3 to build an understanding of place value.

Journal Prompt: Choose a number between 10 and 99. Write it in your journal and draw a sketch of bundles of straws and individual straws to show your number.
Building to 99

**Materials**

**For teacher**
- Base ten blocks
- Building to 99 place value board

**Per student**
- Base ten blocks
- Building to 99 place value board

**Vocabulary**
- Ones
- Tens
- Place value

**Warm-up Flower Power**
- 18

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**Activity:** Today we will use base ten blocks to build numbers to 99. We will use the base ten blocks to show the value of the ones and tens.

**Teacher Note:** This lesson may take more than one session. Students need to fully understand each part before moving on to the next step.

**Part 1 -- Reviewing the values of base ten blocks**

1. The teacher holds up a unit block and asks: What value does this unit block have? (1)

2. The teacher holds up a long and says:
   - This is called a *long*. We are going to find, or prove, the value of a long.
   - Take out one long. Line up unit cubes beside it to find, or prove, how many ones it takes to make a long.
   - What value does a long have? (10) How do you know? (Allow multiple explanations.)
   - In the long, the ten units are hooked together, but their value is still ten.

**Part 2 -- Making tens with the base ten blocks**

1. The teacher gives each student a copy of the place value board, writes a number, for example 26, and says (modeling each step):

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Tens" /></td>
<td><img src="image" alt="Ones" /></td>
</tr>
</tbody>
</table>

   - Put 26 units in the ones column.
Building to 99

- Are there enough units to make a group of 10? (Yes)

- Pick up 10 ones and trade them for a ten. (Students may need to match the units to a long again to become more confident that ten units and one long have the same value.)

- Place the long in the tens column on the place value mat. Why does it belong in the tens column? (Allow multiple explanations.)

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Can you make another group of ten using the units? (yes)

- Every time there are 10 units, we can trade them for a long. Why?

- Pick up 10 more ones and trade them for a ten. (Some students may need to match the blocks again.)

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- How many tens are there in 26? (2 tens) Two tens is 20.

- How many ones are there in 26? (6).

- 26 is 20 and 6.

Part 3 -- Counting the tens and ones

1. The teacher says:

- The long is equal to 10, so I count by tens when I am counting the longs.

- The units are equal to one, so I count by ones when I count the units.
2. The teacher models touching and counting the longs and units: 10, 20, 21, 22, 23, 24, 25, 26.

3. The teacher asks the students to touch and count the blocks on their place value boards.

4. The teacher draws a place value frame around the 26 and labels the value of each place.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

5. The teacher asks:

- What does the two in the ten’s column mean? (two tens, twenty) How did we show 20 with the base ten blocks? (2 longs or 20 units)

- When you read the number 26, what does twenty mean?

- What does the six in the ones column mean? How did we show 6 with the base ten blocks?

- What does it mean to say that 26 = 20 + 6?

6. Repeat parts 2 and 3 with other two-digit numbers. Include some that are a multiple of ten.

Part 4 -- Using tens and ones to represent two-digit numbers

1. The teacher says:

- The place value in each number tells us how many tens and ones there are. For the number 37, you know that you need three longs and seven units, because there is a three in the tens place and a seven in the ones place.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

- Build the number 37 on your place value board.

- You can count your base ten blocks to check: 10, 20, 30, 31, 32, 33, 34, 35, 36, 37.
Building to 99

- When you read the number 37, what does thirty mean?
- What does it mean to say that $37 = 30 + 7$?

2. The teacher varies the number and asks questions to build place value understanding, such as:

- How can you change 37 to 57 with the base ten blocks? What place value changes, tens or ones? Why? (Students change the blocks to represent the new number.)

- Can you make 57 into 53 with the blocks? What place value changes, tens or ones? Why? (Students change the blocks to represent the new number.)

3. The teacher continues with other numbers.

Part 5 -- Sketching representations of base ten blocks

1. The teacher shows students how to sketch base ten representations using lines and dots. For example to represent 35:

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35
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| | | · · · · ·
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2. Students practice sketching the base ten representations of numbers.

**Journal Prompt:** Write a number between twenty and ninety-nine. Sketch how to represent that number using longs and units on a place value board.
## Building to 99

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
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<tbody>
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</tbody>
</table>
TEKS Student Expectation:
The student is expected to use concrete models to represent, compare, and order whole numbers (through 999), read the numbers, and record the comparisons using symbols and numbers (<, >, =). (2.1)
The student is expected to use patterns in place value to compare and order whole numbers. (2.5B)

Materials
For teacher
- Patterns to 99 sheet
Per student
- Patterns to 99 sheet
- 2 transparent counters
Vocabulary
- Pattern
- Compare
- Greater than
- Less than
Warm-up Function Machine
+ 2

Activity: Today we will use a 0-99 chart to discover patterns in place value. Knowing patterns can help when we compare and order numbers.

1. The teacher distributes the Patterns to 99 sheet and reviews the meaning of row and column.

2. The teacher directs students to place a transparent counter on a number, for example, 43. The teacher asks questions which direct attention to the patterns on the 0-99 chart and place value, such as:
   - What number is 2 less than 43? Is it in the same row as 43? Is it before or after 43?
   - What number is 5 more than 43? Is it in the same row? Where?
   - What number is 10 more than 43? Is it in the same column? Where in the column? Why?
   - What number is 20 less than 43? Is it in the same row or the same column? Why?

3. The teacher directs students to place transparent counters on two numbers that are 10 apart, such as 76 and 66. The teacher asks:
   - Which one is the greater number? How can you tell?
   - How can I write a number sentence comparing 76 and 66? (76 > 66 OR 66 < 76) How do you read the number sentence?

4. The teacher gives other pairs of numbers that occur in the same column. Students compare the numbers and write/read a number sentence to record the comparisons. The teacher guides students to the understanding that the number in the tens place determines which is the smaller/larger number when they are different.

5. The teacher directs students to place transparent counters on two numbers that are in the same row, such as 32 and 37. The teacher asks:
   - Which number is less? How can you tell?
6. The teacher gives other pairs of numbers that occur in the same row. The students compare the numbers and write/read the number sentences to record the comparison. The teacher guides students to the understanding that when the tens are the same, the number in the ones place determines which is the larger/smaller number.

7. The teacher directs students to place transparent counters on two numbers that are not in the same row or column, such as 68 and 86. The teacher asks:
   - Which number is less? How can you tell?
   - How can I write a number sentence to record the comparison?
   - How do you read the number sentence?

8. The teacher gives other pairs of numbers that are not in the same row or column and guides students to the understanding that when the tens are different, the value of the digit in the tens place determines the larger/smaller number. The ones do not matter unless the tens are the same.

9. The group completes sentences to make rules: (The teacher records the rules.)

   For example:
   
   To compare numbers with two digits:
   
   When the tens are different, ________________________________.

   When the tens are the same, ________________________________.

**Journal Prompt:** Pick two numbers on the 0-99 chart. Write a note to a second grader telling them how to compare the numbers.
<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
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<td>99</td>
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</tbody>
</table>
**TEKS Student Expectation:**
The student is expected to use concrete models to represent, compare, and order whole numbers (through 999), read the numbers, and record the comparisons using symbols and numbers (<, >, =). (2.1)

**Materials**
<table>
<thead>
<tr>
<th>For teacher</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up Life Saver Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base ten blocks</td>
<td>Base ten blocks</td>
<td>Ones</td>
<td>- 2</td>
</tr>
<tr>
<td>Building to 999 place value</td>
<td>Building to 999 place value board</td>
<td>Tens</td>
<td></td>
</tr>
<tr>
<td>Index cards</td>
<td></td>
<td>Hundreds</td>
<td></td>
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<td></td>
<td></td>
<td>Place Value</td>
<td></td>
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</tbody>
</table>

**Vocabulary**
- Ones
- Tens
- Hundreds
- Place Value

**Activity:** Today we are going to build numbers up to 999 using base ten blocks. The blocks can help us understand the value of numbers in the hundreds, tens, and ones place.

**Teacher Note:** Model and check to see that students are reading numbers correctly. For example: “three hundred seventy-five” (NOT “three hundred and seventy-five”).

**Part 1 -- Reviewing and validating the value of the base ten blocks**
1. The teacher holds up a unit block and asks: What value does this unit block have? (1)
2. The teacher holds up a long and says: This is called a long. What value does the long have? (10) (If necessary, have students line up unit cubes beside the long to prove that it has a value of 10 ones.)
3. The teacher holds up the flat and says:
   - This is a flat. We are going to prove that a flat is equal to 100. Place a flat in front of you. Lay longs on top of it until the entire flat is covered.
   - How many longs did you use to cover the flat? (10) How much is each long worth? (10)
   - Count the longs by 10’s to find out how much the flat is worth. (10, 20, 30 …)
   - How many units would it take to cover a flat? (100)

**Part 2 -- Representing three-digit numbers with base ten blocks**
1. The teacher says: We are going to represent numbers using the base ten blocks. Place value tells us how many flats, longs, and units we need for a number.
2. The teacher writes a three-digit number, for example 375, and labels the place values.

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>7</td>
<td>5</td>
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</table>
3. The teacher asks questions and models building the number:

- How many hundreds are in 375? What can we use to represent 300?
- How many tens are in the number 375? What can we use to represent seven tens?
- How many ones are in the number 375? What can we use to represent five ones?

<table>
<thead>
<tr>
<th>Hundreds</th>
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<th>Ones</th>
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<tbody>
<tr>
<td>[blocks]</td>
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</table>

4. The teacher says:

- I can check that I have the correct base ten blocks for 375 by counting them. I will use skip counting. I will count the flats by 100’s, then the longs by 10’s, and the units by 1’s: 100, 200, 300, 310, 320, 330, 340, 350, 360, 370, 371, 372, 373, 374, 375.

- Why did I count by hundreds, then switch to counting by tens, then switch to counting by ones? (The flats are worth one hundred so you count by hundreds. The longs are worth ten so you count by tens. The units are worth one so you count by ones.)

- What does it mean when we say 375 is equal to 300 + 70 + 5?

5. The teacher clears the place value board and writes a 3, 7, and 5 on index cards. The teacher asks: What is a different three-digit number we could make with a 3, 7, and 5? (Students suggest ways to manipulate the numbers on the index cards to build other numbers, such as 735, 573, 357…)

6. The students select one of the suggested numbers and build it on their place value boards. Reinforce the concept of place value by using another of the suggested numbers.

7. Repeat the process, using other numbers between 100 and 999. Students build on their place value boards. As you select numbers to use, be sure to include some with a zero in the tens and/or ones places.

**Journal Prompt**: Using the digits 1, 4, and 6, write two different numbers and draw how to build them using base ten blocks.
<table>
<thead>
<tr>
<th>HUNDREDS</th>
<th>TENS</th>
<th>ONES</th>
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<tbody>
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</table>
Comparing to 99

TEKS Student Expectation:
The student is expected to use concrete models to represent, compare, and order whole numbers (through 999), read the numbers, and record the comparisons using symbols and numbers (<, >, =). (2.1)

Materials
For group
- Index cards
- Base ten blocks, as needed

Vocabulary
- Greater than, >
- Less than, <
- Symbol
- Comparison

Warm-up
More or Less
Our number today is 66.
Make it 10 more.
Make it 5 less.

Activity: Today we are going to use the symbols for greater than and less than to compare numbers. Comparing numbers help us determine which price is less to pay, or we might want to compare to find out who got more points in a game. Can you think of other times when it would be necessary to compare two numbers?

Teacher Note: It is important for the group to be seated so that the greater than and less than symbols are seen right side up by every student.

1. The students select numbers between 0 and 100 to write on index cards (one number per card), writing the numbers large enough to be seen by the group. (The group needs at least ten cards.) The teacher makes index cards with the greater than, less than, and equal symbols and words. (An equal sign could be needed, depending on the numbers students choose to write.)

2. The students work together to put the numbers in order from least to greatest, leaving room for another index card between the numbers. If students are uncertain how to order the numbers, base ten blocks may be used to build the numbers and compare them. (Or drawings may be made of base ten blocks to represent the numbers, as appropriate.) Students justify their decisions as they order the cards. (If the same number is repeated, just stack the two cards together for now.)

3. The teacher holds up the less than card and says:
   - This symbol means less than. The symbol points to the smaller number.
   - We can use the symbol in a number sentence, such as $9 < 12$. (Write the number sentence.)
Comparing to 99

4. The teacher places the less than card in between the first two numbers in the sequence and reads the number sentence (for example, 23 is less than 37).

5. Students place the less than symbol between the remaining numbers, two at a time, and read the resulting number sentences.

6. The teacher shows students the greater than symbol and says:
   - This is the symbol for greater than. The symbol points to the smaller number and opens to the larger number.
   - We can use this symbol in a number sentence to compare two numbers, such as 12 > 9.

7. The students rearrange the numbers in order from greatest to least, justifying their decisions, and repeat step 5, using the greater than symbol.

8. If two cards are the same, take them now and make a number sentence with the = sign between the two numbers. Discuss the meaning of the word equal. (If students did not happen to make two number cards the same, make a duplicate now.)

9. The teacher takes all the number cards, mixes them together, and puts them in a stack.

10. A student draws two numbers from the stack, makes a number sentence comparing them using one of the symbol cards, and reads the number sentence. Each time, the comparison is justified to answer the question, for example, “How do you know 15 is less than 25?” (Base ten blocks, or drawings of base ten blocks, can be used to support the number comparisons.)

11. The student changes the order of the cards, uses the other symbol to compare the numbers, and reads the new number sentence.

12. The group discusses how to remember which symbol is the less than symbol and which symbol means greater than. (The symbols always point to the smaller number and open to the larger number.)

**Journal Prompt:** Choose two numbers between 10 and 99. Write two different number sentences to compare them. Rewrite each number sentence, replacing the symbols with words.
Comparing to 999

**TEKS Student Expectation:**
The student is expected to use concrete models to represent, compare, and order whole numbers (through 999), read the numbers, and record the comparisons using symbols and numbers (<, >, =). (2.1)

### Materials
For group
- Index cards
- Base ten blocks, as needed

### Vocabulary
- Greater than, >
- Less than, <
- Symbol
- Comparison

### Warm-up
Tell the Time
11:30

### Activity:
Today we are going to compare numbers to 999 and use the greater than and less than symbol to write number sentences. Often we have to recognize if one of two numbers is greater than or less than the other number. For example, if we could choose to buy something at one store for $144 or at another store for $152, we compare the numbers so that we can be wise consumers. Can you think of other times when it would be necessary to compare two numbers?

**Teacher Note:** It is important for the group to be seated so that the greater than and less than symbols are seen right side up by every student.

### Part 1 – Comparing three-digit numbers

1. The students write three-digit numbers on index cards (one three-digit number per card), writing the numbers large enough to be seen by the group. (The group needs at least ten cards.) The teacher makes index cards with the greater than, less than, and equals symbols and words.

   ![Greater than, Less than, Equals symbols]

2. The teacher holds up two cards, such as 378 and 299, and asks: How can I tell which number is greater? (Allow multiple explanations.)

3. The teacher writes the numbers and draws place value frames around them, then says:

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Hundreds</td>
<td>Tens</td>
<td>Ones</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

   - What place should we look in first to compare the numbers? (the hundreds place) Why? (It is the place with the greatest value.)
   - How many hundreds are in 378? In 299? Which is the greater number? Which number is less? How can you tell?
Comparing to 999

4. The teacher then writes two numbers with the same digit in the hundreds place inside the place value frames and says:

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
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<td>4</td>
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</tr>
<tr>
<td>Hundreds</td>
<td>Tens</td>
<td>Ones</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

- How many hundreds are in 234? In 299? Can we compare these numbers just by looking in the hundreds place?
- We need to look in the place with the next largest value. What place is that?
- How many tens are in 234? In 299? Can we compare these numbers by comparing the tens? Which number is greater? How can you tell?
- Look at the ones. There are 4 ones in 234, and 9 ones in 299. Do we need to consider the ones to compare these numbers? Why or why not?

Part 2 – Ordering three-digit numbers and reading comparison sentences

1. The students work together to put the numbers in order from least to greatest, leaving room for another index card between the numbers. For example:

   230  378  559  ...

   If students are uncertain how to order the numbers, base ten blocks may be used to build the numbers and compare them. (Or drawings may be made of base ten blocks to represent the numbers, as appropriate.) Students justify their decisions as they order the cards. (If the same number is repeated, just stack the two cards together for now.)

2. The teacher holds up the less than sign and says:

   - This symbol means less than. The symbol points to the smaller number.
   - We can use the symbol in a number sentence, such as 230 < 378. (Write the number sentence.)

3. The teacher places the less than symbol in between the first two numbers on the number line and reads the number sentence (for example, 230 is less than 378).

   230 < 378  559  ...

   - Students place the less than symbol between the remaining numbers, two at a time, and read the resulting number sentences.
Comparing to 999

4. The teacher shows students the greater than symbol and says:
   - This is the symbol for greater than. The symbol opens to the larger number.
   - We can use this symbol in a number sentence to compare two numbers, such as 124 > 123.

5. The students rearrange the numbers in order from greatest to least, justifying their decisions, and repeat step 3, using the greater than symbol. (If there are no repeated numbers, make a duplicate card now and create a number sentence with the equals sign.)

Part 3 – Comparing numbers in two ways

1. The teacher takes all the number cards, mixes them together, and puts them in a stack.

2. Students take turns to:
   - draw two numbers from the stack,
   - make a number sentence comparing them using one of the symbol cards, and
   - read the number sentence.

Each time, the comparison is justified to answer the question, for example, “How do you know 15 is less than 25?” (Base ten blocks, or drawings of base ten blocks, can be used to support the number comparisons if needed.)

\[
\begin{array}{c}
157 \\
< \\
less than \\
253
\end{array}
\]

157 is less than 253.

The student then changes the order of the cards, uses the other symbol to compare the numbers, and reads the new number sentence.

\[
\begin{array}{c}
253 \\
> \\
greater than \\
157
\end{array}
\]

253 is greater than 157.

Journal Prompt: Choose two new number cards from the stack and compare them using the terms greater than and less than. Explain how you can tell which number is less and which number is greater.
**Number Path**

**TEKS Student Expectation:**
The student is expected to use concrete models to represent, compare, and order whole numbers (through 999), read the numbers, and record the comparisons using symbols and numbers (<, >, =). (2.1)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Missing Addend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per pair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 2 dice: a standard 1-6 cube and a special 4-9 cube.</td>
<td>• Digit</td>
<td>11 – □ = 8</td>
</tr>
</tbody>
</table>

**Activity:** Today we will play a game where we place numbers in sequence on a path.

1. The teacher gives instructions for the game:
   - Draw a 10-step path, like this:
     
     _______ _______ _______ _______ _______ _______ _______ _______ _______
   - With a partner, take turns rolling the dice.
   - With each roll, determine which two-digit numbers could be made. For example, if a 3 and a 7 are rolled, you can make either 37 or 73.
   - Choose one of the numbers to place along the path. All numbers placed on the path must be in order. You decide which of the possible numbers to put on the path and where to place it.
   - If a roll can not be used, make a tally mark. You want to be able to use all of your rolls, so you want to have as few tally marks as possible.
   - The game is over when one person’s path is filled with all the numbers in order.

2. The group plays a sample game. For example, the completed number path may be:

   13  37  39  45  48  56  63  67  78  91

3. Partners play the game together.

**Variation:** Three-Dice Path--Use one regular and 2 special dice. Place 3-digit numbers along the path.

**Journal Prompt:** Write about some of your strategies for putting numbers on the path and what you discovered as you worked.
### TEKS Student Expectation:
The student is expected to represent, compare, and order whole numbers (through 999), read the numbers, and record the comparisons using numbers and symbols (<, >, =). (2.1)

### Materials
**Per pair**
- Base ten blocks – flats, longs, and units

### Vocabulary
- Place value
- Hundreds, tens, ones
- Standard form
- Expanded form

### Warm-up
**Likely/Unlikely**
Sketch a spinner with 4 equal sections. Label them A, E, O, C. Are you more likely to spin a vowel or consonant? Why?

### Activity: We will use various materials to review how to represent, compare, and order whole numbers. We will read and record these numbers in standard and expanded forms. We want to be able to think flexibly about numbers.

1. The teacher writes a number, such as 436, in standard form and asks students to read the number. Students then:
   - Write the number in expanded form and share the answer with a partner.
     
     \[
     400 + 30 + 6
     \]
   - Build the number using base 10 blocks and review how each digit is represented with flats, longs, and units. Sketch the representation.
     
     \[
     \]
   - Sketch a number line and locate the number. What hundreds does the number come between? What tens come before and after the number?
     
     \[
     400 \quad 430 \quad 440 \quad 500
     \]

2. Students select other numbers and the process is repeated. Be sure that some numbers include a zero digit.

### Journal Prompt: Write a three-digit number in both standard and expanded forms, then draw how to represent the number with base ten blocks. Locate the number on a number line.
**TEKS Student Expectation:**
The student is expected to recall and apply the basic addition facts (sums to 18). (2.3A)

**Materials**
- For teacher: Set of playing cards, with tens and face cards removed
- Per pair: Set of playing cards, with tens and face cards removed

**Vocabulary**
- Combinations

**Warm-up Function Machine**
- + 3

**Activity:** Today we are going to play a game where we find two numbers that add up to ten. Knowing all the combinations of ten helps build your mental math skills.

**Teacher Note:** The fact strategy focus is make a ten.

1. The teacher says: Pay close attention to the number pairs I say so you can learn to play the game.
   - The teacher asks a student to pull 3 cards out of the deck and keep them hidden. Tell students that you will be able to name the hidden cards when you are finished.
   - Lay one card face up on the table. Place another card next to it face up. Continue to lay cards face up next to each other. As you place the cards on the table look for pairs that have a sum of ten (9 and Ace, 8 and 2, 7 and 3, 6 and 4, 5 and 5). When you find one of these pairs, announce the two numbers and use the next two cards from the deck to cover them.
   - Continue to deal cards from the deck, covering pairs of cards that have a sum of ten when you see them.
   - A single card left in your hand at the end forms its own stack. When all the cards have been placed on the table, begin picking up pairs of piles whose top cards have a sum of ten.

2. After you pick up all the piles, you will be left with three piles that do not have a match. Reveal the value of the hidden cards to the group. To do this, subtract the value of the top card in each pile from ten to identify the hidden numbers. Example:

   | 8 | 7 | 1 |

   The hidden cards are 2, 3, and 9.
   - \(8 + 2 = 10\)
   - \(7 + 3 = 10\)
   - \(9 + 1 = 10\)

3. The teacher performs the card trick again and students try to determine how the number pairs are related. (They all have a sum of 10.) If students do not find the pattern, share with them that the covered cards all have a sum of 10.
4. If necessary, repeat the game, thinking aloud as you go.

5. The students practice the game with a partner.

Note: An alternative version is to select one card to hide instead of three cards. After all cards are played, one pile will not have a match. The value of the hidden card is the difference between ten and the top card in the pile.

After making pairs of ten, one pile is left. The hidden card is a 6.

\[ 4 + 6 = 10 \]

Note: You may wish to suggest to students that they can use the game as a “magic trick” and add mystery to it by not saying the numbers as they are being covered.

Journal Prompt: List all the pairs of numbers that add to ten. How do you know you have them all?
**Materials**

<table>
<thead>
<tr>
<th>Per pair</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Count Up 1 Lotto game board</td>
<td>• Set of 10 game markers (transparent counters work well)</td>
<td>• More</td>
<td>Life Saver Math – 8</td>
</tr>
<tr>
<td>• Count Back 1 Lotto game board</td>
<td></td>
<td>• Less</td>
<td></td>
</tr>
<tr>
<td>• Count Up 2 Lotto game board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Count Back 2 Lotto game board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Two number cubes (1-6)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Vocabulary**

- More
- Less

**Warm-up**

**Life Saver Math – 8**

---

**Activity:** Today we are going to play lotto games to practice addition and subtraction facts.

1. The teacher asks:
   - What is 8 + 1? 6 + 1? 12 + 1? 45 + 1?
   - Is “plus one” the same as finding the next counting number? Discuss.

2. The teacher explains the Count Up 1 Lotto game.
   - One Count Up 1 Lotto game board and one number cube are needed for two to four players.
   - Each player needs ten game markers.
   - Players take turns. On each turn a player rolls the number cube and covers a space on the game board that is one more than the number rolled.
   - The game is over when the first player uses all ten markers.

3. The students play Count Up 1 Lotto.

4. Playing the other Lotto games:
   - Count Back 1 uses 2 number cubes and the Count Back 1 Lotto game board. The game is played the same way as the Count Up 1 game, except players cover the space on the game board that is one less than the sum of the numbers rolled.
   - Count Up 2 Lotto uses one number cube and the Count Up 2 Lotto game board. Players roll the number cube and cover the number that is two more than the number rolled.
Count Back 2 Lotto uses two number cubes and the Count Back 2 Lotto game board. Players roll the two number cubes, find the sum, and cover the number that is two less than the sum.

**Journal Prompt:** Explain why $7 + 2$ and $9 + 2$ are easy facts to answer.
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</tbody>
</table>
### Count Up 2 Lotto

(Use 1 number cube.)

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<td>6</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
Count Up and Count Back Lotto
Count Back 1 Lotto (Use 2 number cubes.)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>6</th>
<th>5</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td>4</td>
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<tr>
<td>8</td>
<td>9</td>
<td>10</td>
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<td>4</td>
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<td>11</td>
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<td>3</td>
<td>6</td>
<td>7</td>
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</tbody>
</table>
Count up and Count Back Lotto  
Count Back 2 Lotto (Use 2 number cubes.)

<p>| | | | | |</p>
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<td>3</td>
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<td>7</td>
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<td>4</td>
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</tbody>
</table>
TEKS Student Expectation:
The student is expected to recall and apply basic addition facts (sums to 18). (2.3A)

Materials
For group
- Set of Doubles and Neighbors Dots fact cards, cut apart
- Set of Doubles and Neighbors Dots dot cards, cut apart
Per pair
- Set of Doubles and Neighbors Dots fact cards, cut apart

Vocabulary
- Double
- Near double
- Sum

Warm-up
Tell the Time
5:25

Activity: Today we practice a strategy for learning some of the basic addition facts. We'll work with facts called “doubles” and “neighbors,” or near doubles.

Teacher Note: This activity should be done after students have mastered the doubles facts, which is checked in step 2.

1. The teacher explains that doubles are facts where both addends are the same, such as 2 + 2. What are some other double facts?

2. The teacher uses the doubles fact cards (not the dot cards) to assess whether students are fluent with the doubles facts.

Working with the dot cards:

3. The teacher presents a sample doubles dot card, such as the one representing 3 + 3, and explains how the dots are arranged to illustrate a double fact.

4. The teacher presents a related near double, or neighbor, dot card (3 + 4), and asks students to describe the dots on it and how it is related to the representation of the double fact.

5. Students sort the set of dot cards into two sets: doubles facts and near doubles facts. They use their own words to describe how all the cards in each group look alike. (How are all the doubles cards alike? How are all the near doubles cards like each other?)

6. The doubles dot cards are placed in a stack, and the near doubles are spread out on the table. The doubles dot cards are taken one at a time, and the related near double fact is identified and put with it. (3+3 could be matched with 3 + 4 and/or 3 + 2. Students justify each match and explain how the double can help them know the sum of the near double fact.)

Matching the dot cards with the fact cards:

7. The students match each dot card with the related fact card(s). (Because of the commutative property, each near double dot card will be matched with two fact cards.) Each time, the fact is said aloud (3 + 4 = 7). Again, students explain how the doubles help them know the near doubles.
8. The dot cards are set aside.

Working with the fact cards: (Dot cards may continue to be referred to when needed.)

9. Students sort the set of fact cards into two sets: doubles facts and near doubles facts. They use their own words to describe how all the cards in each group are alike. (How are all the doubles cards alike? How are all the near doubles cards like each other?)

10. The near doubles fact cards are placed in a stack, and doubles are spread out on the table. The near doubles fact cards are taken one at a time, and the related double fact that helps find the sum is identified. (3 + 4 could be matched with 3 + 3 and/or 4 + 4.) Students justify each match and explain how the double can help them know the sum of the near double fact.

11. Finally the students work in pairs and use the fact cards to practice the Doubles and Neighbors Dots facts.

Journal Prompt: Explain a strategy to find the sum of 6 and 7.
Doubles and Neighbors Dots
Fact Cards

2 + 2
2 + 3
3 + 2
3 + 3
3 + 4
4 + 3
4 + 4
4 + 5
5 + 4
Doubles and Neighbors Dots
Fact Cards

\[
\begin{array}{ccc}
5 + 5 & 5 + 6 & 6 + 5 \\
6 + 6 & 6 + 7 & 7 + 6 \\
7 + 7 & 7 + 8 & 8 + 7 \\
\end{array}
\]
Fact Cards

8 + 8

8 + 9

9 + 8

9 + 9
Doubles and Neighbors Dots
Dot Cards

Dot Cards...

---

Number, Operation, and Quantitative Reasoning 2005 Page 6 of 8
Doubles and Neighbors Dots
Dot Cards

- [Dot cards with varying configurations of dots]

Number, Operation, and Quantitative Reasoning 2005 Page 7 of 8
TEKS Student Expectation:
The student is expected to recall and apply basic addition facts (sums to 18). (2.3A).

Materials
For group
- Color tiles

Vocabulary
- Doubles
- Near doubles (neighbors)

Warm-up
Missing Addend
□ + 2 = 9

Activity: Today we will use color tiles to build addition facts that are doubles and neighbors (near doubles). This strategy helps with 24 of the basic addition facts.

1. The teacher shows a rectangular arrangement of 2 rows of 3 tiles and asks the students to explain how it is a model for $3 + 3 = 6$. Facts where both addends are the same are called “doubles.”

2. The teacher adds a tile to the $3 + 3$ arrangement and asks the students to explain how it is now a model for $3 + 4 = 7$.

3. The teacher explains this is one way to model addition facts that are called near doubles, or neighbors.
   - When the addends are one apart, the near doubles, or neighbors strategy can be used.
   - For example, to remember $3 + 4 = 7$, the student can think $3 + 3$ and 1 more (or $4 + 4$ and 1 less).

4. The teacher asks students to use the tiles to model doubles and neighbors, such as $7 + 7$ then $7 + 8$, $5 + 5$ then $5 + 6$, etc. Each time students explain how the doubles fact can help them remember the near double, or neighbor, fact.

5. The teacher asks students to use the tiles to model near double facts without building the double first. Each time, students explain how a double fact can help them remember the neighbor fact.

Journal Prompt: Using the words “doubles” and “neighbors,” explain a strategy to remember the sum of $6 + 7$. 
### TEKS Student Expectation:
The student is expected to recall and apply basic addition facts (sums to 18). (2.3A)

### Materials
<table>
<thead>
<tr>
<th>Per pair</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up Likely/Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Set of Plus Ten Fact cards, cut apart</td>
<td>• Plus Ten Fact game strip</td>
<td>• Addend</td>
<td>Sketch a spinner with 4 equal sections. Label them C, A, L, L. Which letter are you most likely to spin? Why?</td>
</tr>
<tr>
<td></td>
<td>• 11 game markers (paper clips or two-color counters)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Activity:
Today we are going to play a game to help learn addition facts with ten as an addend.

### Teacher Note:
A station card for this activity is available in the Fact Pack.

1. The teacher explains that the game has two kinds of cards: cards with dots and cards with addition facts. All of the cards have a 10 on them, either a full ten-frame or a numeral 10.
2. Students look at a few of the cards to find the ten.
3. The teacher explains that each card also has one other addend.
4. Students practice saying the addition fact written or illustrated on a few of the cards.
5. The teacher asks: What is the pattern when you add ten to another number? (Request multiple explanations.)
6. The teacher explains the game:
   - Each player needs a game strip and 11 transparent markers to use as game pieces.
   - All of the cards are shuffled together and placed face down in a stack.
   - On each turn the player turns over one of the Plus Ten Fact cards, says the appropriate number sentence (10 + 7 = 17), and then covers the sum on his or her game strip.
   - The first player to cover the entire strip wins. (If all cards have been turned over and there is no winner, reshuffle and continue.)
7. Each student picks one card and tells his or her strategy for finding the sum when ten is an addend.

### Journal Prompt:
Explain how to add 10 + 8.
Plus Ten Facts

10 + 1
1 + 10
10 + 2
2 + 10

10 + 1

1 + 10
10 + 2
2 + 10
<table>
<thead>
<tr>
<th>Plus Ten Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 + 3</td>
</tr>
<tr>
<td>3 + 10</td>
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<td>4 + 10</td>
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</tbody>
</table>
Adding Sides

**TEKS Student Expectation:**
The student is expected to recall and apply basic addition facts (sums to 18). (2.3A)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Make it Equal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per pair</td>
<td>Per student</td>
<td></td>
</tr>
<tr>
<td>• Paper bag</td>
<td>• Adding Sides chart</td>
<td>20 – □ = 9 + 4</td>
</tr>
<tr>
<td>• Adding Sides</td>
<td>• Sum</td>
<td></td>
</tr>
<tr>
<td>sheets, cut apart)</td>
<td>• Number sentence</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to practice addition facts to 18. By practicing these basic facts often, you will be able to do more difficult addition problems more easily and quickly.

1. The teacher shows the students the polygons that will be in the paper bags. The students need to be given time to observe the polygons and practice counting their sides.

2. The teacher models the game with one student.
   - Each player draws two polygons out of a paper bag.
   - Each player identifies the number of sides on their two polygons and then records the number sentence for the sum of the sides on the Adding Sides chart.
   - The player with the higher sum wins the round.

3. The teacher divides the students into pairs and gives each pair a paper bag of polygons. The group plays the game as time allows.

**Journal Prompt:** Pick a sum between 7 and 9. Draw a picture of the polygons you could have drawn out of the bag to get that sum. Write the number sentence.
<table>
<thead>
<tr>
<th>Draw a sketch of the polygons that you drew out of the bag.</th>
<th>Write the number sentence for finding the sum of the sides of the polygons.</th>
<th>Put a check mark if your sum is higher than your partner’s.</th>
</tr>
</thead>
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</tbody>
</table>
### Colorful Sums

**TEKS Student Expectation:**
The student is expected to recall and apply basic addition facts (sums to 18). (2.3A)

<table>
<thead>
<tr>
<th><strong>Materials</strong></th>
<th><strong>Vocabulary</strong></th>
<th><strong>Warm-up</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Per pair</strong></td>
<td></td>
<td><strong>Flower Power</strong></td>
</tr>
<tr>
<td>2 number cubes</td>
<td>Sum</td>
<td>12</td>
</tr>
<tr>
<td>labeled 0-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 number cubes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>labeled 4-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Per student</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorful Sums sheet</td>
<td></td>
<td></td>
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<tr>
<td>Markers or crayons</td>
<td></td>
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</tbody>
</table>

**Activity:** Today we are going to practice the addition facts by playing a game called Colorful Sums.

**Teacher Note:** A station card for this activity is available in the Fact Pack.

1. Teacher models the Colorful Sums game.
   - Players take turns.
   - Roll two number cubes. On each turn, you can choose any two of the four available number cubes.
   - Say the addition number sentence, for example: “6 plus 2 equals 8.”
   - Fill in the number of squares equal to the sum on the Colorful Sums sheet.
   - The winner is the first person to fill in the entire grid exactly.

2. The students play the game as time allows.

**Journal Prompt:** If I had 13 spaces left on my grid, what two numbers would be a good roll for my next turn?
<p>| | | | |</p>
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</tbody>
</table>
**Domino Challenge**

**TEKS Student Expectation:**
The student is expected to recall and apply basic addition facts (sums to 18). (2.3A)

| Materials | Vocabulary | Warm-up
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Per group of 4</td>
<td>Per pair</td>
<td><strong>More or Less</strong></td>
</tr>
<tr>
<td>- Double 9 Dominoes</td>
<td>- Domino Challenge sheet</td>
<td>Our number today is 132.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make it 10 more.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make it 100 less.</td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to practice the addition facts up to 18. By practicing these basic facts often, you will be able to do more difficult addition problems more easily and quickly.

**Teacher Note:** A station card for this activity is available in the Fact Pack.

1. The teacher gives the students time to explore the dominoes and practice finding the sum of the dots on a domino.

2. The teacher chooses three students to help model the game. Two sets of partners play against each other.

3. Rules of the game:
   - Each team turns over one domino.
   - Each team finds the sum of dots on their domino and records the number sentence on the Domino Challenge recording sheet. (For example: 5 + 9 = 14.)
   - The teams compare the sums, and the team with the higher sum wins the round.
   - In case of a tie, both teams win.
   - Play continues until all dominoes have been used.

**Journal Prompt:** Which sum is higher, 8 plus 9 or 10 plus 6? Prove your answer with domino pictures and number sentences.
### Domino Challenge

<table>
<thead>
<tr>
<th>Your Number Sentence</th>
<th>The Other Team’s Number Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
Punch Cards

**TEKS Student Expectation:**
The student is expected to recall and apply basic addition facts (sums to 18). (2.3A)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Make it Equal</th>
</tr>
</thead>
</table>
| For teacher  
- Sample punch card |  
- Addend  
- Sum  
- Difference |  
18 – □ = 7 + 6 |
| Per student  
- Punch Card sheets, run off on tag board (or may be glued on index cards)  
- Single hole paper punch | |

**Activity:** Today we are going to make punch cards. The punch cards help you practice your facts by using the relationship between addition and subtraction.

**Teacher Note:** This lesson introduces the punch cards. They will be made and used for practice over a period of time.

1. The teacher demonstrates how to make a punch card. Directions are on the Punch Card sheet. An example of the front and back of a completed punch card for the +8 facts is shown. Stress that the answer on the back needs to be written close to the hole with the pencil point.

![Front of card](image1)

![Back of card](image2)

2. The teacher shows how to use the punch card to practice addition facts by sticking a pencil point through the hole on the front side and saying the answer to the addition fact (the number in the center of the card added to the number by the hole). The sum is next to the pencil point on the other side. (You can turn the card over and use it to practice subtraction.)

3. The students make their own punch card for a set of facts that they know well (such as +2) and practice using it for addition and subtraction.

4. Over time, the students make punch cards for the facts they have not yet committed to memory and use them to practice the facts.

**Journal Prompt:** Explain how addition and subtraction are related.
Punch Card Directions
1. Cut the cards apart. (If the paper is not stiff enough, glue each card to an index card.)
2. Punch through the holes with a hole punch.
3. Stick the point of a pencil through each hole and write the sum on the back of the card near the pencil point.
4. If the front of the card says + 4 in the big circle, write - 4 in a big circle on the back so the card can be used to practice related subtraction facts.
Sums on a Strip

**TEKS Student Expectation:**
The student is expected to recall and apply basic addition facts (sums to 18). (2.3A)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Per pair</th>
<th>Per student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Two number cubes labeled 0-5</td>
<td>Sums on a Strip number strip</td>
</tr>
<tr>
<td></td>
<td>Two number cubes labeled 4-9</td>
<td>Sum</td>
</tr>
</tbody>
</table>

**Vocabulary**
- Sum

**Warm-up**
- Flower Power
  - 16

**Activity:** Today we will play a game called Sums on a Strip to practice basic addition facts. The object of the game is to be the first player to cross off all the numbers on the number strip.

Note: A station card for this activity is available in the Fact Pack.

1. The teacher shows a number strip and explains that the numbers represent the sums of basic addition facts.

2. The teacher models the Sums on a Strip game:
   - Players take turns.
   - Roll two number cubes. On each turn you can choose any two of the four available number cubes.
   - Say the related addition number sentence, and cross out the sum on the number strip. (For example, if you roll 5 and 5, you say “5 plus 5 equals 10” and then cross out 10 on the number strip.)
   - The player who crosses out all of the numbers first is the winner.

3. The students play the game in pairs as time allows.

**Journal Prompt:** How did you decide which number cubes to choose for each turn?
### TEKS Student Expectation:
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

### Materials
<table>
<thead>
<tr>
<th>For teacher</th>
<th>Per pair</th>
<th>Vocabulary</th>
<th>Warm-up Function Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counters</td>
<td>Operation Choice, Part 1 Problem Cards, cut apart</td>
<td>Operation</td>
<td>+ 5</td>
</tr>
<tr>
<td>Part-Part-Whole mat</td>
<td></td>
<td>Addition</td>
<td></td>
</tr>
<tr>
<td>Operation Choice, Part 1 Problem Cards, cut apart</td>
<td></td>
<td>Subtraction</td>
<td></td>
</tr>
</tbody>
</table>

### Activity: Today we will sort problems by deciding whether we would use addition or subtraction to solve the problem.

### Teacher Note: Be aware that students may think about adding and subtracting in different ways. For example, some students may add to subtract. In other words, to find the solution to 30 – 18, some students may think like this: Begin with the 18 and find out how far it is from 30. 18 + 2 is 20, and 20 + 10 is 30, so the answer is 2 + 10, or 12.

Students may have learned different procedures for solving addition and subtraction problems than what we call the “standard algorithm.” For example, in Mexico, the procedure for regrouping in subtraction is different from the one generally used in this country, but it is just as efficient. Be attuned to a variety of ways students may think about numbers.

1. **Demonstrating the part-part-whole strategy:**

   The teacher displays a set of counters and says: When you are trying to decide whether to add or subtract to solve a problem, it can help to think about the whole and the parts.

   - (Place all the counters on the “whole” section of the part-part-whole mat.) For example, if I know I have a whole group of this many counters to start with and then some are taken away (move some counters into a “part” section), I can use subtraction to find out how many are in the other part (move the rest into the other “part” section).

   - And if I know that I have this many (indicate one part) and this many (indicate the other part) to begin with and then I put them together (push them together into the “whole” section), I can add to find out how many are in the whole set.

2. **Modeling thinking out loud to understand a problem and choose the operation:**

   The teacher puts out the Add and Subtract cards, holds up the Example A card, and models thinking aloud to solve the problem:

   - I want to read the problem the first time to find out what the situation is. (Read the problem.)
Sam had 5 pieces of paper. He gave 3 pieces to Jim. How many pieces of paper does Sam have now?

The situation is that one boy has some paper and gives some to another boy. That means the whole set was separated into two parts. (Demonstrate on the part-part-whole mat: He had some paper (whole), and then he gave part of his paper away (part). He still has some of his paper left (part).)

- What is the problem asking me to find out? (Read the problem again.) I need to know how many pieces of paper Sam has after he gave some away.

- In this problem, do I need to add to put two parts together, or should I subtract because the whole set has been separated into two parts? (Subtract.) I will put this problem into the subtract pile. (Put the card below the subtract card.)

3. Practicing the strategy and sorting problems:

The group repeats the strategy with the Example B card. The teacher says:

- Let’s see if the same strategy will work when numbers in the problem are larger. Read the problem first to find out what the situation is. (Have a student read the problem.)

  Pam has 23 stuffed animals. She took 15 of them to a sleep-over at Siera’s house. How many did she leave at home?

- What is the situation in the problem?

- Is a set being taken apart, or are two sets being put together?

- How can the situation be demonstrated on the part-part-whole mat?

- Read the problem again so we’re sure what the question is.

- Should we add or subtract to solve this problem? Why?

4. Students work in pairs to discuss and sort the problem cards. They do not solve the problems at this time; the focus is on choosing the operation.

5. The group discusses how they sorted the problems and justify their decisions.

6. If time permits, the problems can be solved.

Journal Prompt: Pick one of the problem cards. Write about how you know whether to add or subtract to solve the problem.
## Operation Choice, Part 1

### Problem Cards

<table>
<thead>
<tr>
<th>Add</th>
<th>Subtract</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

**Example A.**
Sam had 5 pieces of paper. He gave 3 pieces to Jim. How many pieces of paper does Sam have now?

**Example B.**
Pam has 23 stuffed animals. She took 15 of them to a sleepover at Siera’s house. How many did she leave at home?

1. Maria baked 24 chocolate chip cookies and 48 peanut butter cookies. How many cookies did Maria bake?

2. Tyrone played baseball with his friends and made 17 hits. Three of his hits were home runs. How many hits were not home runs?

3. Mr. Raskin went to the hardware store. He bought 78 nails and 47 screws. How many pieces of hardware did he buy?

4. Zachary was building a toy with snap-together blocks. He had 53 blue blocks and 84 red blocks to use. How many blocks did he have?

5. There were 29 cars in the parking lot. 12 of the cars were white. How many were not white?

6. Miss Baldwin bought a box of crackers with 28 crackers in it. She ate 12 of the crackers for lunch. How many crackers does she have now?
Operation Choice, Part 2

**TEKS Student Expectation:**
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Life Saver Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>For teacher</td>
<td></td>
<td>– 6</td>
</tr>
<tr>
<td>• Counters</td>
<td>• Operation</td>
<td></td>
</tr>
<tr>
<td>• Operation Choice, Part 2 cards, cut apart</td>
<td>• Addition</td>
<td></td>
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<tr>
<td>Per pair</td>
<td>• Subtraction</td>
<td></td>
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<tr>
<td>• Operation Choice, Part 2 cards, cut apart</td>
<td>• Comparison</td>
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<td>• Part/Whole</td>
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</tbody>
</table>

**Activity:** Today we will sort more problems by deciding whether we would use addition or subtraction to solve the problem. We will learn more about when to subtract.

1. The teacher models thinking out loud to understand the problem and choose an operation.
   The teacher reads the Example A card:
   
   Serena had 8 hats. Yvonne had 5 hats. How many more hats did Serena have than Yvonne?

   • First I want to be able to tell what the situation is in this problem. Two girls have some hats, but they do not have the same number of hats.

   • I’m going to read the problem again to find out what the question is. (Read the problem again.) I want to know how many more hats one girl has than the other one. That is a comparison problem because I need to compare the number of hats.

   • What do I know about the number of hats? I know that Serena has 8 and Yvonne has 5. (Place counters in rows to represent each girl's hats.)

     Here are Serena’s 8 hats: ⬜⬜⬜⬜⬜⬜⬜⬜

     Here are Yvonne’s 5 hats: ⬜⬜⬜⬜⬜

   • I need to find the difference between the number of hats Serena has and the number of hats Yvonne has. (Indicate the empty space at the end of the row of Yvonne’s hats.) I can use subtraction to find the difference and compare the number of hats the two girls have.

   • I can write the number sentence 8 – 5 = ?. The answer is 3. I’m going to read the problem again to be sure I have the facts right and that I have correctly answered the question in the problem. (Read the problem again.) Do you agree that subtraction solved the problem by comparing the two numbers? I will place the problem in the subtraction stack.
2. The teacher reads the Example B card and guides the students through thinking about the problem:

   There are 9 students seated at desks. 4 of the students are finishing homework and the rest are taking a make-up test. How many students are taking the make-up test?

   - What is the situation?
   - What is the question?
   - How can the problem be represented with counters? (You can put out nine counters and show that four of them represent the students who are finishing homework – either by using two colors or by how the counters are placed.)
   - Does this problem have a total?
   - What are the parts?
   - What is the known part? What is the unknown part?
   - What operation can I use to solve this problem, addition or subtraction?
   - What number sentence can I use to solve the problem?

3. The teacher asks if this think aloud strategy will also work for problems with larger numbers. If more examples are needed, continue to guide students through the Operation Choice problem cards until they are confident solving the problems.

Students need to understand that addition is used to put sets together and that subtraction can be used when something is taken away, to compare, or to find a missing part.

4. Give problem cards to each pair of students. Explain to students that they need to read each problem and discuss what operation they would use to solve the problem. Ask students to sort each problem by whether they would add or subtract to solve it.

5. Have students compare how they sorted problems. Discuss any differences of opinion.

6. If time permits, students can solve the problems.

**Journal Prompt:** Select a problem card and explain how you know whether to add or subtract to solve the problem.
### Add

<table>
<thead>
<tr>
<th>+</th>
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</table>

### Subtract

<table>
<thead>
<tr>
<th>−</th>
</tr>
</thead>
</table>

**Example A:**

Serena had 8 hats. Yvonne had 5 hats. How many more hats did Serena have than Yvonne?

**Example B:**

There are 9 students seated at desks. 4 of the students are finishing homework and the rest are taking a make-up test. How many students are taking the make-up test?

1. Katrina did 85 minutes of homework. She did 18 more minutes of homework than Tamara. How many minutes of homework did Tamara do?

2. Chuck scored 43 points on his video game. Mel had a score of 71 points. How many more points did Mel score than Chuck?

3. Dunbar Elementary had 37 students participate in the Jump-a-thon. Alban Elementary had 42 students participate in the Jump-a-thon. How many students participated in the Jump-a-thon at both schools?

4. The computer company downtown employs 54 people. 39 of the employees are men and the rest are women. How many employees are women?
5. There were 45 seats at the snack bar. 28 seats were occupied and the rest were empty. How many seats were empty?

6. Moreno loaded 21 boxes on the moving van. 17 of the boxes contained breakable items and the rest were unbreakable. How many boxes contained items that were not breakable?

7. The pencil machine holds 53 pencils. 25 of the pencils are decorated and the rest are plain. How many pencils are plain?

8. The Outdoor Learning Center takes care of 20 animals. The city pound takes care of 46 animals. How many more animals does the pound take care of than the Outdoor Learning Center?

9. The school nurse treated 81 students during September. She treated 35 more students in October than she did in September. How many students did she treat in October?

10. One day there were 57 used cars for sale at the car lot. At the end of the day there were 49 of those cars left. How many cars had been sold?

11. The buses used for the field trip to the toy factory each held 46 students. 87 students went on the field trip. 46 students were on the first bus and the rest of the students were on the second bus. How many students were on the second bus?

12. The school choir toured the school singing songs. They sang 17 songs before they took a break and 12 songs after the break. How many songs did they sing?
### TEKS Student Expectation:
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

<table>
<thead>
<tr>
<th>Materials For teacher</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Two colored counters</td>
<td>• Two colored counters</td>
<td>• Make-a-ten</td>
<td>Our number today is 277.</td>
</tr>
<tr>
<td>• Ten frame</td>
<td>• Ten frame</td>
<td>• Sum</td>
<td>Make it 10 more.</td>
</tr>
</tbody>
</table>
|                       |             | • Addend   | Make it 70 less.
|                       |             | • Equal    |         |
|                       |             | • Equivalent |       |
|                       |             | • Benchmark |         |

### Activity:
Today we will use the strategy “make-a-ten” to add two numbers. The number ten is a good benchmark in our place value system.

### Teacher Note:
This lesson teaches students to use the make-a-ten strategy for basic facts and then for larger combinations. The strategy is extended to higher numbers in Larger Frame. This lesson may take more than one day to complete.

### Part One -- Establishing combinations for 10
1. The teacher distributes 10 two-color counters to each student and says: How many ways can you break 10 into two parts, or addends?
2. Students offer combinations, such as 5 + 5 and 1 + 9, demonstrating each with the two-color counters.
3. The teacher leads students to make an organized list of all the combinations for ten. (10 + 0, 9 + 1, 8 + 2…)

### Part Two -- Using a ten frame
1. The teacher writes 9 + 5 =___, and then says:
   - One way to make it easier to add is to look for a way to make a ten. The ten frame helps us do that.
   - I can build the number 9 with red counters on the ten frame (counting out loud as the red counters are placed.)

![Ten Frame Diagram]
How many counters are needed to fill up the ten frame? (1) To add five, we add one yellow counter to fill up the ten frame, and then there are four more, which we can put below the frame.

We now have the problem 10 + 4, which is easy to work in your head.

When you are adding a number to 9, it is easy to make a 10.

How is 9 + 5 the same as 10 + 4? (Allow multiple explanations.)

2. Repeat the process with other combinations, such as 9 + 7, 9 + 4, etc. until students feel comfortable with making a ten when one addend is 9.

3. In the same manner, introduce and practice make-a-ten when one addend is 8, using problems such as 8 + 6, 8 + 3, 8 + 5, etc.

4. Continue, practicing adding a number to 7 and using the make-a-ten strategy. Add 7 + 5, 7 + 7, etc.

5. Working in partners, students use ten frames and counters to solve additional problems, such as 9 + 9, 8 + 6, 7 + 5, etc.

Part Three -- Adding larger addends using two ten frames

1. The teacher writes the number sentence 15 + 8 = _____ and says:

   - We can use two ten frames to make-a-ten when solving problems with larger addends.

   - How will I show 15? (Break 15 apart into 10 and 5. Fill up one ten frame and put 5 more counters in the next ten frame.)

   - There are 5 counters in the second ten frame. How many more counters will it take to fill it up? (5)

   - I place the five yellow counters in the empty squares of the ten frame to fill it up. How many more yellow counters do I need to make 8? (3) They can go beneath the ten frame.
2. How is $15 + 8$ the same as $20 + 3$?

3. Continue to solve problems such as $19 + 6$, $18 + 4$, $17 + 5$, etc. until students are comfortable determining how to break the second addend apart to make the next highest ten.

**Journal Prompt:** Write the number sentence $17 + 9 = ?$ Draw and explain how to use the make-a-ten strategy to solve the problem.
### TEKS Student Expectation:
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

### Materials
**For teacher**
- Base Ten Addition work mat

**For group**
- Base ten blocks – flats, longs, and units

**Per student**
- Base Ten Addition work mat
- Base Ten Addition problem sheet

### Vocabulary
- Addend
- Sum
- Regrouping

### Warm-up
**Tell the Time**
2:45

### Activity:
Today we are going to use base ten blocks to add. Base ten blocks are a useful tool to work with numbers. What does it mean when we say our number system is “based on ten?”

### Teacher Note:
This lesson uses base ten blocks as a model for the standard algorithm for addition. Students may use other strategies or algorithms. For example, a student could efficiently add the tens first and then the ones. A student using that strategy to add 58 + 24 might think: 50 + 20 is 70. 8 + 4 is 12. 70 + 12 is 82.

It would be beneficial to check for any alternative methods students may be using by interviewing your students individually, particularly your struggling students, before beginning the following sequence of lessons on addition and subtraction. For example, give them problems to add and subtract with and without regrouping. Ask them to think out loud as they solve the problems. You will then be able to select tutoring lessons to build on what they know and/or correct any misconceptions. Example problems to use for interviews: 26 + 13, 29 + 37, 34 – 12, 32 – 17.

You may break this into two lessons – Parts 1-3, and Part 4.

### Part 1 -- Addition without regrouping using base ten blocks

1. The teacher reads a problem to be solved:

   Mrs. Clair’s class carried 34 chairs into the cafeteria for the fire safety presentation. Mr. Harper’s class carried 42 chairs to the cafeteria. How many chairs have been taken to the cafeteria?

2. The teacher asks:
   - What is the situation? (People took chairs to the cafeteria.)
   - What do we want to find out? (How many chairs have been taken to the cafeteria?)
   - Are groups of chairs being put together? (Yes)
What operation do we use to combine groups? (addition)

How can we write a number sentence to help solve that problem? (34 + 42 = ?)

3. The teacher writes the number sentence and then rewrites the problem vertically, labeling the tens and ones:

\[
\begin{array}{c@{}c@{}c}
\text{tens} & \text{ones} \\
3 & 4 \\
+ & 4 & 2 \\
\end{array}
\]

4. The teacher uses base ten blocks and the work mat to show students how to represent 34 on the top part of the mat and 42 on the bottom part.

5. The teacher says:

- When we add, we are combining the amounts. We can start by adding the ones. If there are ten or more ones, we group ten ones together to make a ten.

- How many are in the ones column? (6) Can we make a group of ten? (no) So we record six in the ones column of the sum.

\[
\begin{array}{c@{}c@{}c}
\text{tens} & \text{ones} \\
3 & 4 \\
+ & 4 & 2 \\
\hline \\
& 6 \\
\end{array}
\]

- Next we can add the tens. If there are ten tens, we can make a hundred. How many tens are in this problem? (7) Can we make a hundred? (no) So we record the 7 in the tens column. What is the value of 7 tens? (70)
We can check the answer by counting the base ten blocks. When counting the longs, we count by tens because the value of one long is ten. When counting the units, we count by ones because the value of a unit is one. (The teacher models touching each base ten block and counting out loud: 10-20-30-40-50-60-70-71-72-73-74-75-76.)

Is our answer correct?

Let’s reread the problem to see if the answer makes sense. (Reread the problem.)

How many chairs are in the cafeteria? Does our answer make sense?

6. Using base ten blocks and work mats, the students work in pairs to represent and solve another addition problem that does not require regrouping, such as 34 plus 23.

Part 2 -- Addition with regrouping using base ten blocks

1. The teacher gives a problem, such as 45 + 29 = ____.

2. The students work in pairs using base ten blocks to represent the problem on their work mat.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Diagram of base ten blocks for tens]</td>
<td>[Diagram of base ten blocks for ones]</td>
</tr>
</tbody>
</table>

3. The teacher asks:

How many units are in the ones column? (14)

Are there enough ones to make a 10? (yes)

4. The teacher explains and models regrouping by picking up ten units and replacing them with one long. The teacher moves the long to the tens place and records placing 1 ten into the tens column (regrouping) in the addition problem. Fourteen is now recorded as 1 ten, regrouped into the tens column, and 4 ones, which are written in the answer.
5. The teacher explains: Now that we have regrouped, we can count the longs we have in the tens column and record the number of tens in the answer.

\[
\begin{array}{ccc}
\text{tens} & \text{ones} \\
1 & 4 \ 5 \\
+ & 2 \ 9 \\
\hline
7 & 4
\end{array}
\]

6. The students use their base ten blocks to solve another addition problem that requires regrouping, such as 44 + 37. The teacher records the addition problem, step-by-step, as the students work with the blocks.

**Part 3 -- Addition with and without regrouping using base ten blocks**

1. The students solve problems with and without regrouping using the base ten blocks. Example problems: 54 + 35 = ? 37 + 16 = ? 48 + 22 = ?

   For each problem, the teacher records the addition, step-by-step, as the students work with the blocks.
Part 4 -- Moving toward addition without base ten blocks

1. The teacher writes a problem such as \(36 + 28 = ?\), rewrites it vertically, and labels the place values.

\[
\begin{array}{cc}
\text{tens} & \text{ones} \\
3 & 6 \\
+ & 2 8 \\
\end{array}
\]

We can add the ones first. \(8 + 6 = 14\), so we can make a 10 and regroup. If we had base ten blocks, we would pick up ten units and replace them for a long. We can show this with the picture of the base ten blocks by drawing a circle around 10 ones and drawing an arrow to show we are moving them over into the tens place.

2. The teacher sketches how the two addends could be represented with base ten blocks.

\[
\begin{array}{c}
\ldots \ldots \ldots \\
\ldots \ldots \\
\ldots \ldots \\
\end{array}
\]

3. The teacher says:

- We can add the ones first. \(8 + 6 = 14\), so we can make a 10 and regroup. If we had base ten blocks, we would pick up ten units and replace them for a long. We can show this with the picture of the base ten blocks by drawing a circle around 10 ones and drawing an arrow to show we are moving them over into the tens place.

\[
\begin{array}{c}
\ldots \ldots \\
\ldots \ldots \\
\ldots \ldots \\
\end{array}
\]

- In the addition problem, we show this by writing a one above the tens column and recording the 4 in the ones column in the sum.

\[
\begin{array}{cc}
\text{tens} & \text{ones} \\
1 & 3 6 \\
+ & 2 8 \\
\hline
4 \\
\end{array}
\]

- We add the tens, including the ten that we regrouped. \(10 + 30 + 20 = 60\).

\[
\begin{array}{cc}
\text{tens} & \text{ones} \\
1 & 3 6 \\
+ & 2 8 \\
\hline
6 4 \\
\end{array}
\]

- What is the value of 6 in the tens column? What is the sum of 36 and 28?
4. The students follow the instructions on the Base Ten Addition sheet, determining whether a problem will require regrouping and solving those which do. They may use base ten blocks or drawings of base ten blocks as needed.

**Journal Prompt:** Zak worked the problem 45 + 37 and got an answer of 72. Rework Zak’s problem and explain to him what he did wrong.
## Base Ten Addition

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
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</table>
Base Ten Addition

Look at each problem and decide whether or not it will require regrouping. If it does, rewrite the problem and find the sum. You may use base ten blocks or drawings of base ten blocks to help solve the problems.

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<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>18 + 24 = ?</td>
<td>2.</td>
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<td></td>
<td>18</td>
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<td></td>
<td>+ 24</td>
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<td>4.</td>
<td>22 + 15 = ?</td>
<td>5.</td>
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<tr>
<td>7.</td>
<td>35 + 18 = ?</td>
<td>8.</td>
</tr>
<tr>
<td>10.</td>
<td>25 + 37 = ?</td>
<td>11.</td>
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</tbody>
</table>
## Base Ten Subtraction

**TEKS SUIstudent Expectation:**
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Missing Addend</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For teacher</strong>&lt;br&gt;• Base Ten Subtraction work mat&lt;br&gt;• Die</td>
<td>• Difference&lt;br&gt;• Regrouping</td>
<td>6 + □ = 14</td>
</tr>
<tr>
<td><strong>For group</strong>&lt;br&gt;• Base ten blocks</td>
<td></td>
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</tr>
<tr>
<td><strong>Per student</strong>&lt;br&gt;• Base Ten Subtraction work mat&lt;br&gt;• Base Ten Subtraction problem sheet</td>
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</table>

### Activity:
Today we will use base ten blocks to model subtraction and whether or not we need to regroup. The base ten blocks are a very useful tool to help understand what happens to numbers when we subtract, especially when we regroup.

**Teacher Note:** This lesson models the use of the standard algorithm for subtraction with base ten blocks. Students may be using other methods. This lesson may be broken into more than one part.

### Part 1: Practicing regrouping with base ten blocks

1. The teacher gives each student a flat.

   ![Flat Image]

2. The teacher rolls the die to generate a number to be subtracted from the flat. Since the amount can not be physically subtracted from the flat, students trade a flat for ten longs (ten tens). The amount still cannot be subtracted from a long, so one long is traded for ten units (ones). The number can now be subtracted.

   ![Traded Flat Image]

3. The teacher continues to roll the die, and students continue to subtract the amount rolled each time, trading tens for ones when necessary, until there are no more subtractions possible.
4. Steps 1-3 are repeated. This time, the teacher records each subtraction, showing the regrouping when it is necessary.

Part 2: Modeling subtraction problems with the base ten blocks without regrouping

1. The teacher presents a subtraction problem to be solved.

   Jaime had 59 pennies. She spent 37 pennies on a stamp. How many pennies does she have now?

2. Students represent 59 pennies on their base ten mats.

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<th>Tens</th>
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</tbody>
</table>

3. Students subtract 37 pennies (blocks) from their mats. The teacher records the subtraction.

   \[
   \begin{array}{c}
   59 \\
   -37 \\
   \hline
   22 \\
   \end{array}
   \]

Part 3: Modeling subtraction problems with the base ten blocks with regrouping

1. The teacher presents a problem.

   Frank had 31 pennies. He spent 23 pennies on an eraser. How many pennies does he have now?

2. The teacher asks: What operation would be used to solve the problem? (Write the subtraction problem.)

   \[
   \begin{array}{c}
   31 \\
   -\ 23 \\
   \hline
   \end{array}
   \]

3. The teacher asks: How many pennies did Frank have to start with?
4. Students represent 31 with the base ten blocks on their base ten mats.

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<tr>
<th>Tens</th>
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5. The teacher steps students through the standard algorithm for subtraction. Each time an action is taken with the blocks, the teacher records it numerically in the subtraction problem.

- Can 3 ones be taken from 1 one? (no)
- How can we get more ones? (Regroup a ten as ones.)

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<th>Tens</th>
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</table>
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- How many tens are there now? How many ones?
- Do you still have the same amount you started with, 31? How do you know?
- Can 3 ones be taken from 11 ones? Show the subtraction with your base ten blocks.

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<tr>
<th>Tens</th>
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```

```
\[
\begin{array}{ccc}
2 & 1 \\
3 & 1 \\
\hline
& -2 & 3 \\
\end{array}
\]

\[
\begin{array}{ccc}
2 & 1 \\
3 & 1 \\
\hline
& -2 & 3 \\
8 & & \\
\end{array}
\]
How many ones are there now?

How many tens need to be subtracted?

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
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</tbody>
</table>

How many tens are left?

6. The teacher reviews the original word problem and asks students to justify whether the answer makes sense.

7. The group continues to practice subtracting with the base ten blocks and recording the process until understanding is assured. The teacher creates problems that are mixed, so that some require regrouping and others do not. For example: 43 – 17, 59 – 18, etc.

Part 4: Moving toward subtracting without the base ten blocks

1. The teacher presents a subtraction problem to be solved and shows students how the problem could be represented with a sketch of base ten blocks. For example:

   Maria has 36 pennies. She needs 19 pennies for a piece of candy. How much money will she have left if she buys the candy?

   
   
   

2. The problem is solved using the drawing of the base ten blocks, rather than with the blocks themselves, as in the lesson Base Ten Addition.

3. Students follow the instructions and complete the Base Ten Subtraction problem sheet.

Journal Prompt: Alexis worked the subtraction problem 82 – 24 and got a wrong answer of 62. Use sketches of base ten blocks to show Alexis how she can work the problem correctly. Record your work in numbers.
<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
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<tbody>
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</tbody>
</table>
Look at each problem and decide whether or not it will require regrouping. If it does, rewrite the problem and find the difference. You can use base ten blocks or sketches of base ten blocks to help solve the problems.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. 34 - 27 = ?</td>
<td>2. 32 - 14 = ?</td>
<td>3. 89 - 35 = ?</td>
</tr>
<tr>
<td>34</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- 27</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>10. 87 - 37 = ?</td>
<td>11. 30 - 18 = ?</td>
<td>Make your own problem!</td>
</tr>
</tbody>
</table>
**TEKS Student Expectation:**
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

**Materials**
For teacher
- Expand and Add place value mat

For group
- Base ten blocks

For student
- Expand and Add place value mat
- 2 index cards

**Vocabulary**
- Expanded form
- Place value
- Addition
- Sum

**Warm-up Likely/Unlikely**
Sketch a spinner with 3 equal sections. Label them 1, 2, 3. Are you more likely to spin an even or odd number? Why?

**Activity:** Today we are going to write addition problems in expanded form and solve them. Using expanded form helps to understand place value.

**Teacher Note:** This lesson follows the standard algorithm to add two-digit numbers. Students may be using another efficient algorithm.

**Part 1 -- Writing numbers in expanded form**
1. The teacher writes a number, such as 85, and asks: In the number 85, how many tens are there? How many ones? (8 tens, 5 ones)
2. The teacher builds the number on the place value mat using base ten blocks and has the students skip count the blocks in each place to verify the value.
3. The teacher says: This is how we write 85 in expanded form. The value of each digit is shown.

4. 80 + 5

4. The students practice writing other numbers, such as 78, 50, 43, in expanded form and share their answers with the group.

**Part 2 -- Solving addition problems using base ten blocks and expanded form**
1. The teacher writes an addition problem, such as 56 + 25, and asks students to use their base ten blocks and place value mat to show the two numbers.
2. The teacher asks: How would you solve this problem using base ten blocks? (Starting with the ones, there are 11 units, so you regroup by exchanging 10 units for a long. The long goes in the tens column. There are now 8 tens and 1 one. The answer is 81.)
3. The teacher says:
   - You use the same thinking to add using expanded form.
   - What is the expanded form of 56? (50 + 6)
   - What is the expanded form of 25? (25 + 5)
50 + 6
+ 20 + 5

- You start with the ones. 6 + 5 = 11. Eleven is ten and one.

\[
\begin{array}{c}
50 + 6 \\
+ 20 + 5 \\
\end{array} \quad \rightarrow \quad 11 = 10 + 1
\]

- You regroup the ones by moving one group of 10 to the tens column and then recording a one in the ones column.

\[
\begin{array}{c}
10 \\
50 + 6 \\
+ 20 + 5 \\
\end{array} \\
\quad 1
\]

- Next add the tens. 10 + 50 + 20 = 80. Record the answer.

\[
\begin{array}{c}
10 \\
50 + 6 \\
+ 20 + 5 \\
\end{array} \\
\quad 80 + 1 \quad \text{The answer is 81.}
\]

4. Students create problems to be used for practice. Each student gets two index cards. On one card, they write a problem which requires regrouping, and on the other card they write a problem which does not require regrouping. The problems are shuffled, or put into a “hat,” to be drawn out for practice.

5. Students practice solving their addition problems, using base ten blocks or drawings of base ten blocks as needed. Have students examine the problem before they begin and predict whether it will require regrouping.

**Journal Prompt:** Create a 2-digit addition problem. Draw base ten blocks to represent the problem. Show the solution in expanded form.
<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
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<tbody>
<tr>
<td></td>
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</table>
Expand and Subtract

**TEKS Student Expectation:**
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td>• Standard form</td>
<td>Life Saver Math</td>
</tr>
<tr>
<td>• Expand and Subtract problem cards, cut apart</td>
<td>• Expanded form</td>
<td>- 12</td>
</tr>
<tr>
<td></td>
<td>• Difference</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we will use expanded form to subtract. Subtracting with expanded form helps to understand regrouping.

**Teacher Note:** This lesson follows the standard algorithm to subtract two-digit numbers. Students may be using another efficient algorithm.

**Part 1 -- Using expanded form to subtract with no regrouping**

1. The teacher reviews standard form with the students by writing a number, such as 56, and explaining that this is the way we usually see numbers; it is called “standard form.”

2. The teacher reviews expanded form with the students by saying: Sometimes we want to expand a number so that we can see its parts. What is the value of the 5 in 56? (50) We can expand, or stretch out, the number 56 to show that it is made up of 50 plus 6. 50 + 6 = 56. Its expanded form is 50 + 6.

3. The students practice writing numbers such as 32, 67, 91 in expanded form.

4. The teacher tells students expanded form can be used when subtracting. The teacher then reads the problem:

   There are 56 white chickens and 32 red chickens. How many more white chickens are there than red chickens?

5. To model subtraction using expanded form, the teacher asks:

   • What kind of subtraction problem is this? Are we taking away, comparing, or finding a missing part? (We are comparing the number of white chickens to the number of red chickens.)

   • What is the subtraction number sentence to solve this problem? (The teacher writes the number sentence and also records the subtraction problem vertically.)

   $$56 - 32 = ?$$

   $$\begin{array}{c}
   56 \\
   -32 \\
   \hline
   \end{array}$$

   • What is 56 in expanded form? (The teacher writes it next to the number in the subtraction problem.)
56 – 32 = ?  
56 = 50 + 6
- 32

- What is 32 in expanded form? (The teacher writes it next to the number in the subtraction problem.)

56 – 32 = ?  
56 = 50 + 6
- 32 = 30 + 2

- We can subtract the expanded form numbers. What is 6 - 2?

56 – 32 = ?  
56 = 50 + 6
- 32 = 30 + 2
4

- What is 50 – 30?

56 – 32 = ?  
56 = 50 + 6
- 32 = 30 + 2
20 + 4

- We write the expanded form difference as a standard number by adding its parts together. What is the standard form of 20 + 4?

56 – 32 = ?  
56 = 50 + 6
- 32 = 30 + 2
20 + 4 = 24

- If there are 56 white chickens and 32 red chickens, how many more white chickens are there than red chickens? (24)

6. The students practice expanded form subtraction, using problems such as 54 - 13 and 44 - 23.

Part 2 -- Using expanded form to subtract with regrouping

1. The teacher asks questions similar to the ones above to walk the students through subtracting 51 – 23 in expanded form, which requires regrouping.

51 = 50 + 1
- 23 = 20 + 3

- Since we cannot subtract the 3 ones from the 1 one, we know regrouping is necessary. We rename 50 as 40 + 10.

40 + 10
51 = 50 + 1
- 23 = 20 + 3
Now we can add the group of ten to the one, giving us 11.

\[
\begin{align*}
40 + 10 &= 50 + 1 = 40 + 11 \\
- 23 &= 20 + 3 = 20 + 3 \\
\end{align*}
\]

- Who can explain how 50 + 1 is equal to 40 + 11?

- We can subtract the expanded form numbers now. What is 11 - 3? What is 40 - 20?

\[
\begin{align*}
40 + 10 &= 50 + 1 = 40 + 11 \\
- 23 &= 20 + 3 = 20 + 3 \\
20 + 8 &= 28 \\
\end{align*}
\]

- We write the answer in standard form number by adding the parts together. What is the difference in standard form? (28)

2. The students practice subtraction with regrouping in expanded form using problems such as 72 - 38 and 61 - 34.

3. Using Expand and Subtract problem cards, pairs of students take turns reading each problem and discussing what type of subtraction problem each is (taking away, comparison, or finding a missing part). They rewrite the problem in expanded form and solve it.

**Journal Prompt:** Explain why 30 + 3 is equal to 20 + 13.
### Expand and Subtract

1. Bobby had 56 racecars. He gave 12 racecars away. How many were left?  

2. Michelle had 92 pieces of paper. She gave 46 pieces of paper to her friend Tina. How many pieces of paper did Michelle have left?  

3. There were 36 smiley pencils and 17 sunshine pencils. How many more smiley pencils than sunshine pencils?  

4. There were 48 oranges and 15 lemons. How many more oranges than lemons?  

5. 76 horses were in the field. 28 were white. How many were not white?  

6. Gino had 64 slices of pizza for his party. 48 slices were pepperoni. How many were not pepperoni?
**TEKS Student Expectation:**
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Flower Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>For teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base ten blocks</td>
<td>Place value</td>
<td>25</td>
</tr>
<tr>
<td>Larger Frame</td>
<td>Make-a-ten strategy</td>
<td></td>
</tr>
<tr>
<td>place value mat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per student</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base ten blocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larger Frame</td>
<td></td>
<td></td>
</tr>
<tr>
<td>place value mat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to use base ten blocks and the strategy “make-a-ten” to add numbers with sums to 100. Making groups of ten helps us solve problems mentally.

**Teacher Note:** To use the make-a-ten strategy to add two-digit numbers, addition starts with the tens place, not the ones, as we traditionally do. Another ten is made with the ones, if possible. This is a valuable mental math strategy, focusing on place value.

1. The teacher draws a place value frame and records addends, such as 28 + 54, inside it.

<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>+ 5</td>
<td>4</td>
</tr>
</tbody>
</table>

2. The teacher says:
   - We can represent this problem with base tens blocks. We use two longs and eight units to represent twenty-eight. (The teacher places the base ten blocks on the place value mat.)
   - We use five longs and four units to represent fifty-four. (The teacher places the base ten blocks on the place value mat.)
   - We can add the tens by counting the base ten blocks. There are 2 tens and 5 tens. What is the sum of 20 and 50? (70)
3. The teacher reworks the problem from the beginning, recording each step with number sentences:

\[
28 + 54 = \\
70 + 12 \text{ (tens added together, ones added together)}
\]

\[
70 + 12 = 70 + 10 + 2 \text{ (twelve made into 10 + 2)}
\]

\[
70 + 10 + 2 = 80 + 2 = 82
\]

4. Repeat with other problems, such as 38 + 46 and 57 + 29. Include some problems which do not require regrouping. Record the pertinent number sentences, as above, with each step. For each problem:

- Write the numbers to be added.
- Build the numbers with base ten blocks.
- Add the tens.
- Make a ten with the ones, if possible, and put it in the tens place.
- Find the sum of the tens and ones.

5. Partners work together, practicing adding numbers using the make-a-ten strategy, using the blocks as a model. The teacher gives problems, such as 26 + 45, 32 + 65, 29 + 7.

6. The teacher writes a problem to be solved mentally using the make-a-ten strategy. (Students can suggest addends to use. Restricting them to addends between 1 and 50 prevents having a sum greater than 100.) Repeat until students are comfortable with the strategy.

**Journal Prompt:** Write the problem 28 + 48 = ? Explain how to use the make-a-ten strategy to find the sum.
<table>
<thead>
<tr>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Friendly Numbers

**TEKS Student Expectation:**
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Function Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>• Friendly numbers</td>
<td>+ 4</td>
</tr>
<tr>
<td></td>
<td>(compatible numbers)</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today you will practice using "friendly" numbers to make it easier to add and subtract. Friendly numbers are easy to work with mentally.

**Teacher Note:** This lesson uses the strategy of compensation to add two-digit numbers. To use this strategy, numbers are first changed to friendly numbers. Then compensations are made for the changes.

1. The teacher introduces the idea of using friendly numbers with the example 79 + 58. The teacher explains that these numbers can be made easier to work with by using friendly numbers: I can think of 79 as being close to 80 and 58 as being close to 60. Then I can add 80 + 60 = 140.

    \[
    79 + 58 = ? \\
    80 + 60 = 140 \\
    
    \text{If I need the exact answer, I have to take away the 1 that I added to 79, and I also have to take away the 2 that I added to 58.}
    
    140 – 3 = 137
    
    \text{Note: Using friendly numbers is a flexible strategy. The problem above could be solved differently.}
    
    \text{Example 1:} \quad 79 + 58 = ? \\
    \quad 80 + 58 = 138 \\
    \quad 138 – 1 = 137 (1 is added to 79 and then subtracted from the sum.)
    
    \text{Example 2:} \quad 79 + 58 = ? \\
    \quad 80 + 57 = 137 (1 is added to 79 and subtracted from 58.)
    
2. The group works together to adopt this strategy by using it on other problems such as:

    \[
    39 + 48 \quad 26 + 19 \quad 68 + 36 \quad 31 + 52 \quad 42 + 87 \\
    \]

    Ask students to share how they use friendly numbers to solve each problem.

**Journal Prompt:** Explain what you have learned about "friendly" numbers.
### TEKS Student Expectation:
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

### Materials
Per student
- Small bag
- 10 counters
- Picture This sheet

### Vocabulary
- Represent

### Warm-up More or Less
Our number today is 742.
- Make it 200 more.
- Make it 30 less.

### Activity:
Today we are going to investigate how pictures can be used to represent information. Drawing a picture can help you solve problems by showing the information you know.

### Teacher Note:
The focus of this lesson is to learn how to draw a simple picture to help solve a problem. Problems may be solved if time permits.

#### Part 1 -- Modeling the strategy

1. Each student takes a small bag and puts 10 counters in it.

2. The teacher asks:
   - If somebody came in the room and wanted to know how many counters were in your bag, could they tell by looking at the bag? (No, because you cannot see inside the bag.)
   - What can we do to let people know how many counters are inside the bag without having them look? (We could put a label on the bag.)

3. The students label their bags: “10 counters.”

4. The teacher asks:
   - If we put everyone's bags in the middle of the group, how many counters will we have?
   - Do you have to count every counter to get your answer? (No, you can count by tens).
   - How did you know there were ten counters in each bag? (Because of the labels.)

5. The teacher says: When you are solving math problems, it is important to read the problem carefully and think about how you can picture the problem. Drawing a simple picture can help you understand and remember the information in the problem.

6. The teacher models drawing a picture to represent a problem. The teacher says:
   - Raul and Jim will play marbles. Raul has 32 marbles in his bag, and Jim has 29 marbles in his bag. How many marbles do Raul and Jim have?
- I can draw a picture to tell about the problem. I don’t have to draw 32 marbles and 29 marbles, I can just draw bags and label them to show how many marbles are in them.

```
  32
```

```
  29
```

- What does my picture represent?

- What is the problem asking about the marbles? (Reread the problem.)

- Will I add or subtract to solve this problem? How do you know?

**Part 2 -- Using a picture to represent the numbers in a problem**

1. The teacher directs students as they read Picture This problem 1. Students discuss how they can represent the information in the problem and how they can use the pictures to help solve the problem.

2. For problem 2, discuss how the colors could be recorded. Perhaps the colors could be written above or below the balloons. Since only two colors of balloons are needed to solve the problem, the extraneous balloon could be crossed out.

3. Students work problems 3 and 4, discussing how they can represent the information in the problem with a simple drawing.

**Part 3 -- Writing a story problem and drawing a picture to represent the information**

1. The students write an addition or subtraction story problem and draw a simple picture to represent the facts.

2. The students share their problems and pictures.

**Journal Prompt:** Draw simple pictures to represent the number of girls and the number of boys in our class.
1. The twins Siera and Serena are spending the night at a friend's house. Siera packed 29 CD's to play, and Serena packed 17 CD's to play. How many more CD's did Siera pack than Serena?

2. When Jan went to the circus, she saw a clown. The clown had 8 red balloons, 5 yellow balloons, and 9 green balloons. How many red and green balloons did the clown have?

3. Bob went to the beach. He found 10 black shells, 10 white shells, and 10 starfish. How many shells did Bob find?

4. John went to the movie theater. He ate 15 red hots during the previews, 15 red hots during the show, and 15 red hots on the way home from the movies. How many red hots did he eat that day?
**TEKS Student Expectation:**
The student is expected to select addition or subtraction and solve problems using two-digit numbers whether or not regrouping is required. (2.3B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td></td>
<td><strong>Tell the Time</strong></td>
</tr>
<tr>
<td>Base ten blocks,</td>
<td>Problem solving</td>
<td>10:10</td>
</tr>
<tr>
<td>calculators, and/or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other tools to solve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>problems, as needed</td>
<td>plan</td>
<td></td>
</tr>
<tr>
<td>Per student or pair</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td>Problem Plan</td>
<td>Number sentence</td>
<td></td>
</tr>
<tr>
<td>sheet (problems cut apart, if you choose)</td>
<td>Reasonable</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to use a problem solving plan to help us solve problems. We use a plan to help organize our thinking.

**Part 1 -- Modeling the problem solving plan**

1. The teacher explains that to solve a problem you must first **understand** the problem and **make a plan** to solve it.

2. The teacher reads problem 1 out loud:
   
   Chris went to a beach. He counted 26 seagulls. He found 12 large seashells and 37 small seashells. How many seashells did he find?

3. The teacher tells the students that the first step in the problem solving process is to **understand** the problem. The teacher asks questions such as:
   - What is the situation in the problem?
   - What is the question? What are we trying to find out?
   - What information do we need to answer the question?
   - Are there any numbers in the problem that we do not need?

4. When the problem is well understood, the teacher says: Now we need to create a **plan**. The teacher asks questions such as:
   - How can we solve the problem?
   - What tools could we use? Is it a mental math problem, a paper and pencil problem, or a calculator problem?
   - Could we draw a picture, write a number sentence, or use manipulatives?
   - What operation will solve this problem?
5. The teacher summarizes the plan that the group has made for the problem. For example:
Since I want to know how many seashells Chris found, I am going to put together the number
of small and large seashells by adding. I’m going to write an addition number sentence, 12 + 37 = ____, because he found 12 large and 37 small seashells. This would be a good problem
to solve with paper and pencil for me. I could draw a picture if I needed to. It might look like
this:

6. The teacher says: The next step in the problem solving process is to solve the problem. I am
going to add 12 + 37. How can I add 12 plus 37?

\[ \begin{array}{c}
12 \\
+ \\
37 \\
\end{array} \]

7. The teacher says: The last step in the problem solving process is to look back.

- The sum is 49. What are there 49 of? Label the answer.
- Re-read the problem and make sure that we answered the question that was asked. What
  was the question? Is that what we answered?
- Does the answer make sense? Is 49 a reasonable answer? How do you know?
- Is there another way we could solve the problem to check it?

8. The teacher reviews and discusses the problem solving steps used: understand, plan, solve,
and look back.

Part 2 -- Solving problems

1. Students solve the problems on the Problem Plan sheet, either individually or in partners.
   They can use available tools.

2. The group discusses the solutions to the problems.

Journal Prompt: Pick one problem you solved on the Problem Plan sheet. Tell how you know
your answer is reasonable.
<table>
<thead>
<tr>
<th>Problem Plan</th>
</tr>
</thead>
</table>
| 1. Chris went to a beach. He counted 26 seagulls. He found 12 large seashells and 37 small seashells. How many seashells did he find? | 2. Cindy has 45 brown rocks, 39 white rocks, and 26 red rocks. How many more brown rocks than red rocks does Cindy have?  
| 3. There were 67 trout and 25 perch swimming in the river. How many fish were swimming in the river? | 4. There were 93 students in the school play. 57 of them were girls. How many boys were in the play?  
| 5. Jack went to the mountains. He made 25 snowballs. He threw 14 of the snowballs at a tree. How many snowballs does he have now? | 6. Kathryn went to the pond. She counted 12 grasshoppers, 19 ladybugs, and 15 lily pads. How many insects did she see?  
| 7. Zack went camping for 2 nights. He saw 39 fireflies the first night. He saw 24 fireflies the second night. How many fireflies did he see? | 8. Suzy helped fill water glasses at the drinking station. At 12:00 she filled 54 glasses with water. She filled 27 glasses with tea. How many glasses did she fill?  
| 9. There were 38 puppies and 20 kittens at the pet show. How many fewer kittens than puppies were at the pet show? | 10. Joe does fifty sit-ups every weekend. He always does twenty-five sit-ups on Saturday. How many sit-ups does he do on Sunday? |
**Coin Value**

**TEKS Student Expectation:**
The student is expected to determine the value of a collection of coins less than one dollar. (2.3C)

### Materials

**For teacher**
- Index cards

**Per student**
- Magnifier

**For group**
- Coins (pennies, nickels, dimes, quarters)
- Play coins
- Coin Value sheet

### Vocabulary

- Coin/s
- Penny
- Nickel
- Dime
- Quarter
- Value
- Skip count

### Warm-up

**Missing Addend**

12 – □ = 5

### Activity:

In order to count money, you must know the value of coins. Today we will use the value of coins to count money.

**Part 1: Learning about the coins**

1. The teacher gives each student a penny and asks them to examine both sides of the coin with a magnifier.
2. Taking turns, each student makes one statement to describe the coin.
3. The teacher asks the name and value of the coin, writes the answers on an index card, and lays the card beside the penny.

**Example:**

![Penny]
1 cent
1¢

4. The teacher repeats steps 1-3 for nickel, dime, and quarter.

**Part 2: Matching coins with representations of coins**

1. The teacher distributes play money and has students match a play coin to each of their real coins.
2. The teacher hands out the Coin Value sheet and has students match a real coin to each picture.

**Part 3: Counting sets of coins**

1. The teacher puts out a set of pennies and asks:
   - How much is each penny worth?
   - To count the value of all of the pennies, how would we count?
2. The students count the pennies.

3. Repeat step 1-2 with nickels, dimes, and quarters.
   - For nickels, skip count by 5’s.
   - For dimes, skip count by 10’s.
   - For quarters, skip count by 25’s.

**Journal Prompt:** Pick a secret coin and describe it in three statements so that a partner can guess what it is.
<table>
<thead>
<tr>
<th>Coin Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Coin Image" /></td>
</tr>
<tr>
<td><img src="image3" alt="Coin Image" /></td>
</tr>
<tr>
<td><img src="image5" alt="Coin Image" /></td>
</tr>
<tr>
<td><img src="image7" alt="Coin Image" /></td>
</tr>
<tr>
<td><img src="image9" alt="Coin Image" /></td>
</tr>
</tbody>
</table>
**Materials**

<table>
<thead>
<tr>
<th>For teacher</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up Likely/Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bag</td>
<td>Coins</td>
<td>• Coin/s</td>
<td>Sketch a spinner with</td>
</tr>
<tr>
<td>Coins</td>
<td>Pig Cents work mat</td>
<td>• Penny</td>
<td>6 equal sections.</td>
</tr>
<tr>
<td>Pig Cents cards, cut apart</td>
<td></td>
<td>• Nickel</td>
<td>Label them S, P, I, D,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Dime</td>
<td>E, R.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Quarter</td>
<td>Are you more likely to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Value</td>
<td>spin a vowel or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Skip count</td>
<td>consonant? Why?</td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to practice counting groups of coins in a piggy bank, and then we will match the groups of coins to their value.

**Part 1 - Reviewing and counting groups of coins**

1. The teacher holds up a dime and asks:
   - What is this coin called?
   - What is its value?
   - If I am going to count a group of dimes, how do I skip count?

2. The teacher repeats step 1 with pennies, nickels, and quarters.

3. The teacher reaches into a bag for a small handful of coins, places them on the Pig Cents work mat, and asks: What is an easy way to count these coins? (Answers will vary. Line the coins by how much they are worth, group the coins to form multiples of 10, etc.)

4. The teacher models how to count the coins, touching each coin and moving it over to keep track of what has been counted. (For example, to count 1 quarter, 3 dimes, 1 nickel, and 3 pennies, one way to count is to place the nickel beside the quarter and say: I am going to add the nickel to the quarter first to make 30 cents, so I can count using multiples of ten, 25-30-40-50-60. Now I am going to count on, 61-62-63.)
5. The students count the coins again with the teacher.

6. Using a Pig Cents work mat, students:
   - Each get a small group of coins and organize them to count.
   - Take turns telling how they organized their coins and counting them out loud to the group.

Part 2 - Matching groups of coins to their value

1. The teacher:
   - Places the Pig Cents coin cards on one side of the table and the Pig Cents value cards on the other side and tells the group they will match groups of coins to their correct value.
   - Holds up a coin card, touches each coin, and counts out loud.
   - Finds the matching value card, holds it up, and says: This card says thirty-two cents and the sum of my coins is thirty-two cents. These cards are a match.

2. Taking turns, students take a coin card, count the coins, and then locate the value card that matches it.

3. The teacher gives each student a set of Pig Cents cards to match.

Journal Prompt: Draw a picture of something you would like to buy for less than $1.00. Tell what coins you will use to purchase that item.
<table>
<thead>
<tr>
<th>Cards</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>66¢</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>56¢</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>50¢</td>
</tr>
<tr>
<td>Cards</td>
<td>Value</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>85¢</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>48¢</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>35¢</td>
</tr>
<tr>
<td>Image</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>76¢</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>46¢</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>51¢</td>
</tr>
<tr>
<td>Cards</td>
<td>91¢</td>
</tr>
</tbody>
</table>
**Coin Riddle**

**TEKS Student Expectation:**
The student is expected to determine the value of a collection of coins less than one dollar.  (2.3C)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td></td>
<td><strong>Make it Equal</strong></td>
</tr>
<tr>
<td>• Coins</td>
<td>• Coin</td>
<td>17 – □ = 8 + 5</td>
</tr>
<tr>
<td>• Index cards</td>
<td>• Cent/s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Penny</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Nickel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dime</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Quarter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Value</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we will create a coin collection and determine its value. Then, we will write clues to create a riddle for others to solve.

1. The teacher reviews the value of individual coins by selecting a coin and having students give its name and value.

2. As a group, the students make a collection of coins worth 14 cents and make other groups of coins that have the same value.

3. The teacher models writing a riddle with the group’s collection of coins. For example, for 2 nickels and 4 pennies, the clues could be:
   - Clue 1: My value is 14 cents.
   - Clue 2: I have 6 coins.
   - Clue 3: I have two different kinds of coins.
   - What are my coins?

4. The group checks each clue to see that it correctly describes the collection of coins.

5. The teacher says: You will create coin riddles for the group. Good riddle clues start with a broad statement and then become more specific. Here are the steps for your riddle.
   - Clue 1 states the value of the collection of coins.
   - Clue 2 tells how many coins are in the collection.
   - Clue 3 tells the number of different kinds of coins in the collection and asks the question.

6. The group makes another collection of coins and writes a riddle together, then checks it to be sure each step correctly describes the collection. The answer is drawn on the back of the riddle.
7. Pairs of students make a collection of coins, write a riddle, and draw the answer on the back. (A book can be used as a screen to keep others from seeing the collection before hearing the riddle.)

8. The group shares and solves each other’s riddles.

**Journal Prompt:** Draw a picture of a collection of coins and write a coin riddle.
100 Chart Puzzle

TEKS Student Expectation:
The student is expected to find patterns in numbers such as in a 100s chart. (2.5A)

Materials
For teacher
- 100 Chart
- Transparent chip (or other game board marker)

For group
- 100 Chart Puzzle, cut apart

Vocabulary
- More than
- Less than

Warm-up
Flower Power
15

Activity: Today we will look for patterns on a 100 chart. We will see how easy it is to add and subtract using those patterns.

1. The teacher shows a 100 chart and asks students to look for patterns. (Allow the students to share their observation.)

2. The teacher places a transparent marker on the number 37 and asks:
   - What number is 1 more than 37? Which direction did you go on the 100 chart to find 1 more than the number?
   - What number is 1 less than 37? Which direction did you go to find 1 less than the number?
   - What number is 10 more than 37? Which direction did you go to find 10 more than a number? 10 less?
   - Is this always true on a 100 chart? Why?

3. Each student is given a 100 chart puzzle piece. In turn, each student points to a number on their puzzle piece and asks the other group members questions such as what number is one greater? One less? 10 greater? 10 less?

4. The students put their puzzle pieces together to make a complete 100 chart.

5. The teacher places a transparent marker on the number 37 and asks, “If I wanted to add 20 to this number, what should I do? If I wanted to subtract 30 from this number, what should I do?”

6. Using the 100 chart, students solve problems such as 67 + 10, 84 – 50, 21 + 30, etc.

Journal Prompt: How does understanding the 100 chart help us with adding and subtracting numbers quickly?
<table>
<thead>
<tr>
<th>1</th>
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<td>100</td>
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</tbody>
</table>
100 Chart Puzzle

Cut along bold lines.

1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100
**TEKS Student Expectation:**
The student will find patterns in numbers such as in a 100s chart. (2.5A)

**Materials**
For teacher
- 100 Chart sheet
- 300 Chart sheet

For student:
- 100 Chart sheet
- 300 Chart sheet

**Vocabulary**

**Warm-up Flower Power 60**

<table>
<thead>
<tr>
<th>Activity:</th>
<th>Today we are going to use what we know about patterns on the 100 chart to find missing numbers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The teacher presents the 100 Chart Puzzle sheet to the group and explains that most of the numbers are missing. The teacher points to the cell below the 15 and asks</td>
<td></td>
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<tr>
<td></td>
<td>• What number comes below the 15 on the 100 chart? (Write 25.)</td>
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<td></td>
<td>• What number is to the right of 25? (Write 26.)</td>
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<td></td>
<td>• What number is to the right of 26? (Write 27.)</td>
</tr>
<tr>
<td>2. Repeat with the other numbers on the 100 Chart Puzzle sheet.</td>
<td></td>
</tr>
<tr>
<td>3. (Optional) If students are able to solve the 100 chart puzzles, increase the level of difficulty. Use the 300 chart to place 3-digit numbers in the grids.</td>
<td></td>
</tr>
</tbody>
</table>

**Journal Prompt:** Explain the pattern as you move to the left, right, up and down on a 100 chart.
Secret Number Search on the 100 Chart

TEKS Student Expectation:
The student will find patterns in numbers such as in a 100s chart. (2.5A)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up Life Saver Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>For teacher</td>
<td>100 chart</td>
<td>Digit</td>
<td>–7</td>
</tr>
<tr>
<td></td>
<td>Secret Number Search sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per student</td>
<td>100 chart</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Transparent chip</td>
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<td></td>
<td>(or other game board marker)</td>
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</tbody>
</table>

Activity: Today we will practice finding secret numbers by using the patterns on the hundred chart.

1. The teacher explains that secret number searches will include several moves (up, down, left, right) on the 100 chart. Each move will begin with the answer to the previous clue.

2. Conduct a secret number search together to be sure everybody understands. Using the 100 chart, the teacher places a chip on the number 54 and directs students to:
   - Take away 1. (53)
   - Add 10. (63)
   - Add 2.
   - What is the secret number? (65).

3. The teacher discusses with students how they know which direction to go when asked to add or subtract on the 100 chart. Ask:
   - What happens to the value of the ones digit as you move to the right? (adds 1; becomes one more)
   - What happens to the value of the ones digit as you move to the left? (subtracts 1, becomes one less)
   - What happens to the value of the tens digit as you move up? down? (increases or decreases by 10)

4. Repeat step 2 with new clues. (See Secret Number Search sheet for examples.)

5. Students write their own secret number search clues and read them to each other.

Journal Prompt: I started at 47 and ended on 66. What two clues could have been in my secret number search?
Secret Number Search on the 100 Chart

Secret Number Search A
• Find 13 on your chart.
• Add 3. Add 10.
• Subtract 2.
• Add 20.
• What is the secret number? (44)

Secret Number Search B
• Locate 75 on your chart.
• Subtract 10.
• Add 3.
• Subtract 20.
• Add 2.
• What is the secret number? (50)

Secret Number Search C
• Put your finger on the number of cents in a dime (or 10).
• Subtract 1.
• Add 30.
• Add 2.
• Subtract 1.
• Add another dime (or 10).
• What is the secret number? (50)

Secret Number Search D
• Find the number of cents in a quarter (or 25).
• Add 30.
• Subtract 3.
• Add 40.
• Subtract 2.
• Subtract 1.
• Add 11.
• What is the secret number? (100)
<p>| | | | | | | | | | | |</p>
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</tbody>
</table>
**TEKS Student Expectation:**
The student is expected to use patterns to develop strategies to remember basic addition facts. (2.5C)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up More or Less</th>
</tr>
</thead>
<tbody>
<tr>
<td>For teacher</td>
<td>• Double</td>
<td></td>
</tr>
<tr>
<td>• Double Images sheet (images folded and cut out)</td>
<td></td>
<td>Our number today is 480. Make it 20 more. Make it 200 less.</td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to practice the double facts. You can find examples of the double facts in nature.

**Teacher Note:** Prior to the lesson, use the Double Images sheet to prepare models of the frog, insect, and spider. Fold paper and place the dotted lines of the template along the fold. Make a mirror image by cutting through both layers.

1. The teacher holds up the paper spider that is folded in half and asks.
   - How many legs do you see?
   - How many legs will you see when I unfold the spider?
   - What double addition fact goes with the spider’s legs? (4 + 4 = 8)

2. The teacher repeats with the frog and insect.

3. Have students find examples of the doubles facts in their environment.

**Examples:**
1 + 1 a pair of shoes
2 + 2 the legs on both sides of a frog
3 + 3 the legs on both sides of an insect
two rows of three in a six-pack of Dr. Pepper
4 + 4 four legs on each side of a spider
5 + 5 the number of fingers on two hands
6 + 6 two rows of six eggs in an egg carton
7 + 7 the days in two weeks
8 + 8 two rows of eight crayons in a box of 16
9 + 9 the wheels on both sides of an 18 wheeler
10 + 10 the number of fingers and toes

**Journal Prompt:** Draw a picture to represent a doubles fact and write the number sentence.
Double in the Mirror

**TEKS Student Expectation:**
The student is expected to use patterns to develop strategies to remember basic addition facts. (2.5C)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per pair</td>
<td></td>
<td>Tell the Time</td>
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<tr>
<td>- Small mirror (or mira)</td>
<td>- Double</td>
<td>8:20</td>
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<tr>
<td>- Double in the Mirror picture cards, cut apart</td>
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</tr>
</tbody>
</table>

**Materials Vocabulary Warm-up**

**Activity:** Today we are going to look at what it means to see double. This will help you with some of your addition facts.

1. The teacher asks:
   - What does the word double mean? Can you use it in a sentence?
   - Which of your addition facts are the doubles? Why do we call them that?

2. The teacher models how to use the picture cards to find doubles by
   - stating the number of objects in a picture (Some of the cards can have more than one interpretation. For example, you can predict the total number of smiley faces or the total number of eyes.)
   - predicting the total number of objects that will be seen when the picture is doubled by the mirror. The students place the picture card in front of the mirror to verify their prediction.
   - stating the double fact as a number sentence.

3. Students use the picture cards to practice finding doubles facts.

**Journal Prompt:** Draw a picture that you can hold up to a mirror and see 8 objects when the picture is doubled.
TEKS Student Expectation:
The student is expected to use patterns to develop strategies to remember basic addition facts.
(2.5C)

Materials
For group
- Deck of cards with tens and face cards removed

Vocabulary
- Sum

Warm-up Missing Addend
9 + □ = 16

Activity: Today we are going to play a game where we are looking for combinations that make ten. Patterns make it easier to remember addition facts.

1. The teacher asks students to give number sentences with a sum of 10 and records their answers.

2. The teacher asks students how to make an organized list to make sure that they have every sum of ten. Record the organized list. For example:
   - 9 + 1 = 10
   - 8 + 2 = 10
   - 7 + 3 = 10
   - 6 + 4 = 10
   - 5 + 5 = 10
   - 1 + 9 = 10
   - 2 + 8 = 10
   - 3 + 7 = 10
   - 4 + 6 = 10

3. The teacher asks which facts from the list are turn-around facts. (9 + 1 and 1 + 9, etc.)

4. The teacher models how to play Make Ten. The goal is to combine two cards to make a sum of 10.
   - Cards are shuffled and placed in a stack face down. Players take turns drawing a card and laying it face up on the table.
   - Each time a player draws a card, he says what other card he needs to make a sum of ten. For example, if a player draws a 4, he says, “I have a four. I am looking for a six.”
   - When a player can combine his card with another card to make 10, he says the number sentence and keeps the pair of cards. For example: “4 + 6 = 10”
   - Play continues around the circle until no more combinations of 10 can be made.
   - The player with the most cards wins.

Journal Prompt: Number your paper from one to ten. Beside each number write the number you would need to make a sum of ten.
## Addition Strategies

**TEKS Student Expectation:**
The student is expected to use patterns to develop strategies to remember basic addition facts. (2.5C)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Likely/Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>For teacher</td>
<td></td>
<td>Sketch a spinner with 8 equal sections.</td>
</tr>
<tr>
<td>• Addition Strategies chart</td>
<td>• Sum</td>
<td>Label them 13, 14, 15, 16, 198, 176, 4, 2.</td>
</tr>
<tr>
<td>For group</td>
<td>• Strategy</td>
<td>Are you more likely to spin a 2-digit or 3-digit number? Why?</td>
</tr>
<tr>
<td>• Addition Strategies Fact Cards, cut apart</td>
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</tbody>
</table>

### Activity:
Today we are going to use patterns and strategies to solve addition facts. It is important for you to know your facts so that you can solve problems more easily.

### Notes:
1) In this lesson, students will discuss each of the major addition fact strategies. For more information about the strategies, see the introduction to the Fact Pack.
2) The fact cards for this lesson include a sample of the basic addition facts, not all of them.
3) Many facts can be solved using more than one strategy. For example, 9 + 8 could be solved with Fast Nines, Fast Eights, or Neighbors.

1. The group discusses the Facts with Zero strategy.
   - Students sort the cards to find all of the cards that can be solved using this strategy.
   - Students add those facts to the recording chart in the My Examples column.
   - Students use the pattern and add more examples to the chart.

2. Repeat with each of the remaining strategies.
   - Count Up 1
   - Count Up 2
   - Doubles
   - Neighbors (Near Doubles)
   - Fast Nines (Make a Ten with 9)
   - Fast Eights (Make a Ten with 8)
   - Make Ten (Combinations that Make Ten – This is not a strategy, *per se*, but these facts enable students to use other strategies.)

3. After students complete the chart, reshuffle the cards and turn the stack face down. Each student takes a card, reads the fact and gives a strategy that could be used to find the answer.

### Journal Prompt:
Write an addition fact that is hard for you to remember. Write about how you can use a strategy to help you remember the answer.
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Example</th>
<th>My Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facts with Zero</td>
<td>$6 + 0 = 6$</td>
<td></td>
</tr>
<tr>
<td>Count Up 1</td>
<td>$6 + 1 = 7$</td>
<td></td>
</tr>
<tr>
<td>Count Up 2</td>
<td>$6 + 2 = 8$</td>
<td></td>
</tr>
<tr>
<td>Doubles</td>
<td>$6 + 6 = 12$</td>
<td></td>
</tr>
<tr>
<td>Neighbors</td>
<td>$6 + 5 = 11$</td>
<td></td>
</tr>
<tr>
<td>Fast Nines</td>
<td>$9 + 6 = 15$</td>
<td></td>
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<tr>
<td>Fast Eights</td>
<td>$8 + 6 = 14$</td>
<td></td>
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<tr>
<td>Make Ten</td>
<td>$6 + 4 = 10$</td>
<td></td>
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<tr>
<td>Addition Strategies</td>
<td>Fact Cards</td>
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<td>+ 9</td>
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<td>+ 8</td>
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<td>+ 6</td>
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<td>+ 8</td>
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<td>8</td>
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<tr>
<td>+ 2</td>
<td>7</td>
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<tr>
<td>+ 9</td>
<td>9</td>
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<td>6</td>
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<tr>
<td>+ 8</td>
<td>0</td>
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<tr>
<td>+ 5</td>
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<tr>
<td><img src="image13" alt="Sum" /></td>
<td><img src="image14" alt="Sum" /></td>
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</tr>
</tbody>
</table>
**TEKS Student Expectation:**
The student is expected to solve subtraction problems related to addition facts (fact families).
(2.5D)

<table>
<thead>
<tr>
<th><strong>Materials</strong></th>
<th><strong>Vocabulary</strong></th>
<th><strong>Warm-up</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Per student</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Unifix cubes (in 2 different colors)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Crayons</td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>• Fact family</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we will use unifix cubes to show how addition and subtraction are related. We will build fact families to help remember addition and subtraction facts.

1. The teacher leads the students to build an example fact family with the unifix cubes, recording each step.

2. Choose one color and snap together 3 cubes.
   - Choose a different color and snap together 4 cubes.
   - Add the 3 cubes and 4 cubes together to form a train. What is the sum?
   - We can build a fact family using 3, 4, and 7.
   - Turn your cube train so that it shows 4 + 3?
   - Does the sum change when the 3 and the 4 are turned around?

3. For subtraction, start with the 7 cubes.
   - When we take 4 cubes away, how many cubes are left? What is the number sentence?
   - If we take 3 cubes from 7, how many are left? What is the number sentence?

4. The four number sentences make a fact family. Why is it called a fact family?

5. Repeat these steps with other sets of numbers with sums to 18. For each fact family, students build the problem with cubes and write all the number sentences in the fact family. (If a fact family is made with a double, such as 5 + 5 = 10, there will only be two number sentences.)

**Journal Prompt:** Pick any two numbers between 0 and 9 and write the fact family.
Domino Facts

**TEKS Student Expectation:**
The student is expected to solve subtraction problems related to addition facts (fact families) such as \(8 + 9 = 17\), \(9 + 8 = 17\), \(17 - 9 = 8\), \(17 - 8 = 9\). (2.5D)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Dominoes (double nines, if possible)</td>
<td>• Domino Facts sheet</td>
<td>• Fact family</td>
<td>Flower Power</td>
</tr>
<tr>
<td>Per student</td>
<td></td>
<td>• Number sentence</td>
<td>84</td>
</tr>
</tbody>
</table>

**Activity:**
Today we will practice writing related addition and subtraction facts, or fact families, using dominoes.

**Teacher Note:**
It is important for all students to be seated so that they see the demonstration domino from the same perspective.

1. The teacher shows a domino and says:
   - How many dots are on the left hand side of the domino? the right?
   - How many dots in all?
   - What is the addition number sentence to describe adding the dots on this domino? \(5 + 3 = 8\)

2. The teacher rotates the domino, so that the dots from the left hand side are now on the right hand side and says:
   - How many dots are on the left hand side? the right?
   - How many dots in all?
   - What is the addition number sentence to describe adding the dots on this domino? \(3 + 5 = 8\)
   - If I cover up the 3, how many dots are still showing?
   - What number sentence can we write to describe this subtraction? \(8 - 3 = 5\)
   - If I cover up the 5, how many dots are still showing?
   - What number sentence can we write to describe this subtraction? \(8 - 5 = 3\)

3. Working in pairs, the students choose a domino and record the related addition and subtraction facts on the Domino Facts sheet. Continue until the sheet is complete.

**Journal Prompt:**
Explain how you know that \(7 + 4 = 11\) and \(11 - 4 = 7\) are in the same fact family.
## Domino Facts

<table>
<thead>
<tr>
<th>Domino (Draw a picture)</th>
<th>Addition Fact 1</th>
<th>Addition Fact 2</th>
<th>Subtraction Fact 1</th>
<th>Subtraction Fact 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$5 + 3 = 8$</td>
<td>$3 + 5 = 8$</td>
<td>$8 - 3 = 5$</td>
<td>$8 - 5 = 3$</td>
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</tbody>
</table>
**Fishing for Fact Families**

**TEKS Student Expectation:**
The student is expected to solve subtraction problems related to addition facts (fact families) such as $8 + 9 = 17$, $9 + 8 = 17$, $17 - 9 = 8$, $17 - 8 = 9$. (2.5D)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Function Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per group of four</td>
<td>• Fact family</td>
<td></td>
</tr>
<tr>
<td>• Fishing for Fact Families cards, cut apart</td>
<td></td>
<td>+ 8</td>
</tr>
</tbody>
</table>

**Activity:** Today we will match addition and subtraction facts into fact families. Fact families show patterns in addition and subtraction.

**Note:** A station card for this activity is available in the Fact Pack.

1. The teacher shows four cards which make a fact family and says:
   - How are the facts on these cards related?
   - These four cards together are called a fact family.

2. The teacher explains the game. Partners play against another partner pair in teams.
   - Deal seven cards to each team. Place the rest of the cards face down in a stack in the center of the table.
   - Similar to the game Go Fish, teams take turns asking for cards that will help make a fact family. For example: “Do you have a card in the same fact family as $6 + 7 = 13$?”
   - If the other team has any related fact(s), they must give them up. The team can keep asking until the other team does not have a card they are asked for.
   - If the team does not have a card in the fact family, they say, “Go fishing for a fact family.” Then the other team takes the top card from the stack.
   - Whenever a complete fact family (four cards) is made, the cards are laid down face up.
   - When all cards have been played, the team with more complete fact families wins.

**Journal Prompt:** If you are asked for a match for $7 + 8 = 15$, what cards would you look for in your hand?
<table>
<thead>
<tr>
<th>4</th>
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<th>9</th>
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<td>11</td>
<td>4</td>
<td>7</td>
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<tr>
<td>Fishing for Fact Families</td>
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<td>4 +8 12</td>
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<td>8 +4 12</td>
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<td>12 -8 4</td>
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<tr>
<td>12 -4 8</td>
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<td>4 +9 13</td>
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<td>6 +5 11</td>
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<td>11 -6 5</td>
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<td>-8</td>
<td>9</td>
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</tbody>
</table>
TEKS Student Expectation:
The student is expected to solve subtraction problems related to addition facts (fact families) such as $8 + 9 = 17$, $9 + 8 = 17$, $17 - 9 = 8$, $17 - 8 = 9$. (2.5D)

Materials
For group
- Bag
- Cubes

Vocabulary
- Fact family

Warm-up
Life Saver Math
- 5

Activity: Today we will use addition facts to find the answer to related subtraction facts.

1. The teacher counts eight cubes into the bag. Then the teacher reaches into the bag, pulls out three cubes, and says:
   - How many cubes did I put into the bag? (8)
   - How many cubes did I remove from the bag? (3)
   - To find out how many cubes are still in the bag, I can think: (write) $3 + ? = 8$. Three plus what number is equal to eight?
   - Without looking, how many cubes are left in the bag?

2. The teacher writes $8 - 3 = ?$ and says:
   - When you need to solve a subtraction problem, you can use a related addition fact.
   - What addition fact can I think about to find the answer? ($2 + ? = 5$)

3. Students take turns picking a number between 8 and 18 cubes to put in the bag. Another student draws some cubes out, and the group uses the think-addition strategy to find how many cubes remain in the bag. The teacher records related number sentences, as above.

Journal Prompt: Write a story problem about someone removing cubes from a bag, like the problems we have solved.
Subtraction – Think Addition

TEKS Student Expectation:
The student is expected to solve subtraction problems related to addition facts (fact families) such as \( 8 + 9 = 17, 9 + 8 = 17, 17 - 9 = 8, 17 - 8 = 9 \). (2.5D)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per pair</td>
<td>• Sum</td>
<td>More or Less</td>
</tr>
<tr>
<td>Subtraction -Think Addition cards, cut apart</td>
<td>• Difference</td>
<td>Our number today is 508. Make it 50 more. Make it 300 less.</td>
</tr>
</tbody>
</table>

Activity: Today we are going to practice subtraction facts by using addition facts. Using addition facts can make subtraction facts easier to learn.

1. The teacher gives the students the following problem:

   Travis has 15 dollars. He spends 7 dollars to buy lunch. How much money does he have left?

   (The students share strategies for solving this problem. Responses may be varied such as drawing a picture, using subtraction, or using addition.)

2. The teacher has the students discuss the concept of fact families. She explains that addition puts groups together and subtraction involves taking a group apart.

3. The teacher holds up one gray card at a time and the students give the answers. (If the students are having difficulty, the teacher should switch to the white cards and see how comfortable the students are with the addition version of the same facts.)

4. The teacher places the white cards face up on the table so every card can be seen. She places the gray cards face down in a stack.

5. A student draws a card from the stack of gray cards, finds the related addition card, and reads both number sentences, filling in the blanks. (Example: \( 16 - 7 = 9 \) and \( 9 + 7 = 16 \)).

6. Students work in partners and match the fact again.

Journal Prompt: Explain how addition can help you answer this subtraction problem: The box of chocolates had 17 pieces of candy. There were 8 caramels and the rest were cremes. How many cremes were in the box?
<table>
<thead>
<tr>
<th>Subtraction – Think Addition</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 – 5 = ___</td>
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<tr>
<td>16 – 7 = ___</td>
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<tr>
<td>17 – 8 = ___</td>
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<tr>
<td>14 – 6 = ___</td>
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<tr>
<td>15 – 7 = ___</td>
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<td>16 – 8 = ___</td>
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<td>15 – 6 = ___</td>
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<td>14 – 7 = ___</td>
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<td>15 – 8 = ___</td>
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<td>12 – 6 = ___</td>
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<td>13 – 7 = ___</td>
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<td>14 – 8 = ___</td>
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<td>11 – 6 = ___</td>
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<td>12 – 7 = ___</td>
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<td>13 – 9 = ___</td>
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<td>10 – 6 = ___</td>
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<td>11 – 7 = ___</td>
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<td>12 – 9 = ___</td>
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<td>-------</td>
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<tr>
<td>5 + __ = 13</td>
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<td>6 + __ = 14</td>
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<td>6 + __ = 15</td>
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<tr>
<td>6 + __ = 12</td>
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<tr>
<td>6 + __ = 11</td>
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<tr>
<td>6 + __ = 10</td>
</tr>
</tbody>
</table>
Sorting Subtraction

**TEKUUS Student Expectation:**
The student is expected to solve subtraction problems related to addition facts (fact families) such as $8 + 9 = 17$, $9 + 8 = 17$, $17 - 8 = 9$, and $17 - 9 = 8$. (2.5D)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Per pair</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up Life Saver Math – 9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sorting Subtraction cards sets 1 and 2, cut apart</td>
<td>Sorting Subtraction</td>
<td>Basic fact</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>addition chart</td>
<td>Fact family</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to practice deciding whether a subtraction problem is a basic fact or not.

1. The students examine the Addition Chart and discuss what makes an addition fact a “basic” fact. (Both addends are one-digit numbers. The sums go from 2 to 18.)

2. The teacher says that the basic facts for subtraction are the ones that are related to the basic addition facts (fact families). What is an example of a fact family?

3. The teacher distributes the Sorting Subtraction set 1 cards, and students take turns sorting the cards into two piles:
   - Problems that are basic facts.
   - Problems that go beyond the basic facts.

   Students explain the reasons used for sorting. (Students will have differing levels of memorization and mental math skills. Students can use the addition chart to justify the way they sort the cards.)

4. The group generates some possible rules for deciding if a subtraction problem is a basic fact or not.

5. Repeat, using set 2 of the Sorting Subtraction cards. Students test the rules and make additional rules or changes if needed.

**Journal Prompt:** $17 - 9 = \_\_\_\_$ Is this problem a basic addition fact? Explain why or why not.
<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>11</td>
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<td>23</td>
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<tr>
<td>23</td>
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<td>15</td>
<td>-8</td>
<td>25</td>
</tr>
<tr>
<td>26</td>
<td>-8</td>
<td>11</td>
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<tr>
<td>17</td>
<td>-9</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>-9</td>
<td>22</td>
</tr>
<tr>
<td>13</td>
<td>-6</td>
<td>24</td>
</tr>
<tr>
<td>16</td>
<td>-8</td>
<td>21</td>
</tr>
<tr>
<td>12</td>
<td>-9</td>
<td>22</td>
</tr>
<tr>
<td>13</td>
<td>-4</td>
<td></td>
</tr>
</tbody>
</table>
### Sorting Subtraction

<table>
<thead>
<tr>
<th>+</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
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<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
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<tr>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
</tbody>
</table>
Paired Numbers, Part 1

**TEKS Student Expectation:**
The student is expected to generate a list of paired numbers based on a real-life situation such as number of tricycles related to number of wheels. (2.6A)
The student is expected to identify patterns in a list of related number pairs based on a real-life situation and extend the list. (2.6B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>• T-chart&lt;br&gt;• Pattern</td>
<td>Tell the Time&lt;br&gt;2:40</td>
</tr>
</tbody>
</table>

**Activity:** Today we will create lists of numbers and put them into a t-chart. The t-chart will help keep the numbers organized.

1. The teacher asks each student to draw a simple picture of one dog on a piece of paper.
2. The teacher draws a t-chart and labels the left column *Dogs* and the right column *Legs*.
3. The teacher asks one student for her/his dog picture and asks:
   - How many dogs do we see? (Write 1 in the left column of the t-chart.)
   - How many legs are there on one dog? (Write 4 in the right column.)
4. The teacher asks for another dog picture and places it next to the first one.
   - Now how many dogs do we see? (Write 2 in the left column.)
   - How many legs are there on two dogs? (Write 8 on the right column.)
5. Continue until all the drawings have been used and the numbers recorded on the t-chart.

<table>
<thead>
<tr>
<th>Dogs</th>
<th>Legs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>

6. The teacher asks students to describe patterns on the chart. Some important patterns to notice are:
   - The numbers in the Dogs column increase by one.
   - The numbers in the Legs column increase by four.
   - The number of legs is always four times the number of dogs.
7. The teacher asks the students to find out how many legs 8 dogs would have. The students discuss how the answer can be found, and the teacher adds the numbers to the chart.
8. The teacher asks the students to find out how many dogs there would be if there were 40 legs. Students need to share their strategies for finding the answer. The teacher writes the correct numbers on the chart.

9. The teacher asks the students to find out how many dogs there would be if there were 28 legs. Students need to share their strategies for finding the answer. The teacher writes the correct numbers on the chart.

**Journal Prompt:** Draw a t-chart that shows the relationship between the number of people and the number of eyes. Draw a happy face to represent each person.

<table>
<thead>
<tr>
<th>Number of People</th>
<th>Number of Eyes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>?</td>
</tr>
<tr>
<td>?</td>
<td>22</td>
</tr>
</tbody>
</table>
TEKS Student Expectation:
The student is expected to generate a list of paired numbers based on a real-life situation such as number of tricycles related to number of wheels. (2.6A)
The student is expected to identify patterns in a list of related number pairs based on a real-life situation and extend the list. (2.6B)

Materials
For group
• Pattern blocks

Vocabulary
• T-chart
• Pattern

Warm-up
Life Saver Math
–3

Activity: Today we will create lists of numbers and put them into a t-chart. We will use the numbers in the t-chart to solve a problem.

1. The teacher draws a t-chart, labeling the left column Triangles, and the right column Sides.

2. The teacher displays one triangular pattern block and asks: If I have one triangle, how many sides are there? (Write 1 in the Triangle column and 3 in the Sides column.)

3. The teacher places another triangular pattern block next to, but not touching, the first and asks: If I have two triangles, how many sides are there? (Add the numbers to the t-chart.)

4. Repeat until there are 5 triangles with 15 sides.

5. The teacher asks students to describe patterns on the chart. Some important patterns to notice are:
   • The number of triangles is increasing by one.
   • The number of sides is increasing by three.
   • The number of sides is always three times the number of triangles.

6. The teacher asks:
   • What do you predict will come next on the t-chart? (6 triangles, 18 sides)
   • How many triangles are there if there are 27 sides?

7. Students discuss their strategies for finding the answer.

8. The teacher leads the group to begin a new list of related number pairs with the following questions.
   • The third grade was planning a field trip to the science museum. Each teacher was putting her students into groups of five. How can we set up a t-chart to organize information about
the number of groups and students?

- How many students will there be in 2 groups?
- How many groups would a teacher have if there were 15 students in school that day?
- How many groups would the teacher have if there were 20 students at school?

9. Students contribute questions which can be answered from the t-chart about the groups and students going on the field trip.

10. The teacher asks: How does the t-chart help you find, predict, and extend a pattern?

**Journal Prompt:** Write one question which can be answered from the t-chart we made about the groups and students going on the field trip.
TEKS Student Expectation:
The student is expected to identify attributes of any shape or solid. (2.7A)
The student is expected to use attributes to describe how two shapes or solids are alike or different. (2.7B)

### Materials
For group
- Two-dimensional object, such as a sheet of paper
- Three-dimensional object, such as a box of markers
- Shapes and Solids cards, cut apart
- Index cards

### Vocabulary
- Attributes
- Shape
- Solid
- Two-dimensional
- Three-dimensional
- Side/Edge
- Face
- Vertex/Vertices

### Warm-up

#### Missing Addend
□ – 8 = 15

### Activity:

Today we will look at pictures of some objects and find ways they are alike and different. Describing shapes and solids using their attributes makes it easier to communicate about them.

1. The teacher displays a sheet of paper and a three-dimensional object such as a box of markers. She asks students to describe each object guiding them to use geometry words such as flat, edge, corner. She tells them that the words they use to describe objects are the objects’ attributes.

2. The teacher distributes the Shapes and Solids cards and instructs students to study the geometric attributes of each pictured object, such as vertices, faces, edges, and sides. Make sure that students understand that they are finding the attributes for the real objects and not the picture itself. For example, a real book is three-dimensional.

3. The teacher gives an attribute, and the students form a set with the cards that have that attribute. Then the teacher provides formal geometric language and writes a label for the set on an index card. Use instructions such as:
   - Make a set of objects that are flat. (These are 2-dimensional geometric figures.)
   - Make a set of objects that are not flat. (3-dimensional)
   - Make a set of objects that show things that have corners. (angles/vertices)
   - Make a set of objects that are flat and could roll. (no vertex)
   - Make a set of objects with one or more straight sides. (sides/edges)
   - Make a set of objects that do not have a straight side. (no sides/edges)
   - Make a set of three-dimensional objects that have a flat surface. (faces)
   - Make a set of three-dimensional objects that do not have a flat surface. (no faces)

4. The students take turns describing attributes for other sets.

### Journal Prompt:
Pick your favorite card and describe all the attributes you can about the object.
<table>
<thead>
<tr>
<th>Triangle</th>
<th>Stop Sign</th>
<th>No Entry Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Sign</td>
<td>Exit Sign</td>
<td>Telephone Symbol</td>
</tr>
<tr>
<td>Road Sign</td>
<td>Curve Sign</td>
<td>One Way Sign</td>
</tr>
<tr>
<td>For Rent Sign</td>
<td>Closed Sign</td>
<td>Railroad Cross Sign</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>Truck Sign</td>
<td>Direction Sign</td>
</tr>
<tr>
<td>Apple</td>
<td>Can</td>
<td>Gift Box</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Can</td>
<td>Box</td>
<td>Traffic Cone</td>
</tr>
<tr>
<td>Basketball</td>
<td>Bowling Ball</td>
<td>Bucket</td>
</tr>
<tr>
<td>Jar</td>
<td>Book</td>
<td>Tire</td>
</tr>
<tr>
<td>Pyramid</td>
<td>Pipe</td>
<td>Bucket</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TEKS Student Expectation:**
The student is expected to identify attributes of any shape or solid. (2.7A) The student is expected to use attributes to describe how two shapes or solids are alike or different. (2.7B)

<table>
<thead>
<tr>
<th>Materials For group</th>
<th>Vocabulary</th>
<th>Warm-up Flower Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assortment of geometric solids, both commercial and real-world (such as boxes, cans, balls, ice cream cones, etc)</td>
<td>Geometric solid</td>
<td>19</td>
</tr>
<tr>
<td>A bag for each object</td>
<td>Attribute</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Side</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Edge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Face</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Corner / vertex / vertices</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we will identify some mystery objects by using descriptive words or attributes to tell about them.

1. The teacher explains the activity:
   - Each bag contains an object that is a geometric shape or solid. It might be one of the geometry solids that we've used, or it might be an everyday object.
   - One at a time, you will select a bag. The mystery object cannot be looked at or taken out of the bag. (The teacher may need to help hold the bag for the student.)
   - Taking turns, you will reach into your bag, feel the object, and describe its attributes without naming the actual object.
   - The other students will guess what the object is based on your description.

2. The teacher chooses one bag and models the activity

3. The teacher tells the students that when they describe an object they are talking about its *attributes*.

4. Each student takes a turn.

**Journal Prompt:** If a soup can were inside a bag, what words would you use to describe it?
### Differences and Similarities

**TEKS Student Expectation:**
The student is expected to identify attributes of any shape or solid. (2.7A)
The student is expected to use attributes to describe how two shapes or solids are alike or different. (2.7B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Likely/Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td>• Side</td>
<td>Sketch a bag having 3</td>
</tr>
<tr>
<td></td>
<td>• Angle</td>
<td>blue, 1 red, and 3</td>
</tr>
<tr>
<td></td>
<td>• Differences</td>
<td>yellow squares in it.</td>
</tr>
<tr>
<td></td>
<td>• Similarities</td>
<td>Which color are you</td>
</tr>
<tr>
<td></td>
<td>• Attribute</td>
<td>least likely to pull out?</td>
</tr>
<tr>
<td>Per student</td>
<td></td>
<td>Why?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to practice identifying attributes of shapes. We will look for all the ways that two shapes are the same and different.

1. The cards are spread out so that everyone can view them. The students study the cards and describe what they observe about the attributes of the shapes. (They should notice that there are six different shapes and be able to give a name for each one, that the shapes have three different markings, and that the shapes are either large or small.)

2. The teacher asks the students to find a shape that fits specific attributes. Each time, the students choose a shape that fits all the clues and compare their choice with the other students, discussing the similarities and differences. The teacher gives directions, such as:
   - Point to a shape with six sides.
   - Point to a shape with three angles.
   - Point to a large six-sided shape (hexagon) without stripes.
   - Point to a shape with less than four sides.
   - Point to a shape that has the same number of angles as sides.
   - Point to a small triangle with stripes.

3. The students take turns describing attributes of a shape for others to find.

4. Students work in partners to complete the Differences and Similarities sheet.

**Journal Prompt:** Pick two of your favorite shapes and describe how they are alike and different.
<table>
<thead>
<tr>
<th>Differences and Similarities</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Square" /></td>
</tr>
<tr>
<td><img src="image4" alt="Rectangle" /></td>
</tr>
<tr>
<td><img src="image7" alt="Hexagon" /></td>
</tr>
<tr>
<td><img src="image10" alt="Irregular Hexagon" /></td>
</tr>
<tr>
<td><img src="image13" alt="Triangle" /></td>
</tr>
<tr>
<td><img src="image16" alt="Right Triangle" /></td>
</tr>
<tr>
<td><img src="image19" alt="Acute Triangle" /></td>
</tr>
</tbody>
</table>

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Geometry and Spatial Reasoning

2005

Page 2 of 4
### Differences and Similarities

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Rectangle" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
<tr>
<td><img src="image" alt="Square" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
<tr>
<td><img src="image" alt="Rectangle" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
<tr>
<td><img src="image" alt="Parallelogram" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
<tr>
<td><img src="image" alt="Parallelogram" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
<tr>
<td><img src="image" alt="Parallelogram" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
<tr>
<td><img src="image" alt="Triangle" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
<tr>
<td><img src="image" alt="Triangle" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
<tr>
<td><img src="image" alt="Triangle" /></td>
<td><img src="image" alt="Grid Pattern" /></td>
<td><img src="image" alt="Shaded Pattern" /></td>
</tr>
</tbody>
</table>
Look at the two shapes. Tell how they are alike and how they are different.

These figures have all been sorted into the same group because they have two attributes that are the same. What are two attributes that they all share?
**Secret Attribute**

**TEKS Student Expectation:**
The student is expected to identify attributes of any shape or solid. (2.7A)
The student is expected to use attributes to describe how two shapes or solids are alike or different. (2.7B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Life Saver Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td>Attribute</td>
<td>- 11</td>
</tr>
<tr>
<td>• Secret Attribute cards, cut apart</td>
<td>• Side</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Angle</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:**  Today we will look at geometric shapes to determine what attributes they have. We will tell about attributes such as the number of sides or angles.

1. The cards are spread out so that everyone can view them.
2. The teacher models how to play the game Secret Attribute.
   - The leader decides on a secret attribute, writes it on a piece of paper, folds the paper, and sets it aside. (For example: 4 sides)
   - The leader makes a set of a few shapes which have the secret attribute.
   - The leader asks others, in turn, to select another polygon which they believe has the same attribute. The student picks up a shape and says, "Does this have the secret attribute?"
   - The leader responds with either, "Yes, this has the secret attribute," or "No, this does not have the secret attribute."
3. After the group has added three or four polygons to the original set, the teacher asks: What information did you use to determine the secret attribute?
4. Repeat, with students taking turns deciding on the secret attribute.

**Journal Prompt:**  Sketch three cards that share an attribute and write about how they are alike.
**TEKS Student Expectation:**
The student is expected to cut geometric shapes apart and identify the new shapes made. (2.7C)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up Function Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per student</td>
<td>• Tangram</td>
<td>+ 12</td>
</tr>
<tr>
<td>• Tangram square</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Scissors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we will use tangrams to combine shapes to create other shapes.

1. Each student cuts the square into the seven tangram pieces.

2. The students create as many rectangles as they can using two or more of the tangram pieces. The students trace each rectangle, showing both the outline and the components (tangram pieces that have been combined to create it). Students compare their pictures.

3. The students create as many triangles as they can using two or more of the tangram pieces, trace the outline and its components, and compare their pictures.

4. The teachers asks: What other polygons can you make?

5. The students create, trace, and compare their polygons.

6. The students create a shape using all seven tangram pieces and trace just its outline.

7. The students exchange outlines and try to assemble the tangram pieces to cover the shape.

**Journal Prompt:** Cut the square piece in half on the diagonal. Create and identify another polygon using the two pieces.
TEKS Student Expectation:
The student is expected to use whole numbers to locate and name points on a line. (2.8)

Materials
For group
• String (3’)
• Let’s Go Fly a Kite bows, cut apart (four sets)

Vocabulary
• Number line

Warm-up
More or Less
Our number today is 879.
Make it 100 more.
Make it 70 less.

Activity:  Today we are going to use our knowledge of number lines to place numbers in order and to space them like they would be on a number line.

1. The teacher lays down the string and says:  This is an “up and down” number line, kind of like the tail on a kite or the numbers you might write when you are making a list.

2. The teacher shows the bows from Set A and asks:
   • What would be the first number at the top of the number line?  (Place the 0 at the top.)
   • What would be the last number from this set on the number line? (Place 50 at the bottom.)
   • Since the number line shows the numbers from 0-50, what number would go in the middle? (Place 25 halfway between 0 and 50.)
   • How can we decide where 49 belongs?  Explain.
   • How can we decide where 10 belongs?  Explain.
   • Where does 40 belongs?  Explain why.
   • What is another number that you could write on the last blank bow and put on the number line?

3. Repeat step 2 with Set B (between 0 and 100), Set C (between 50 and 200), and Set D (between 0 and 300).

Journal Prompt:  Draw a number line from the top to the bottom of your page.  Write 0 at the top and 100 at the bottom.  Pick five other numbers to write on the number line.
**Activity:** Today we are going to find points on a number line. Sometimes the points on a number line are labeled with numbers that are skip counted. Knowing the skip counting pattern can help find all the numbers on the line. This is important, for example, when you read a thermometer.

1. The teacher shows the students the first number line (0 to 15, counting by 1’s) and asks questions such as:
   - Where would 6 be located? How do you know?
   - Where would you put 14? How do you know?
   - What number would you place right here? (Point to a place.) How do you know?

2. The teacher shows the students the second number line (0 to 75, counting by 5’s) and asks questions such as:
   - How is this number line different from the first one? (different amount of space between the 0 and 10, etc.)
   - How are they the same?
   - Where would 5 be located on this number line? How do you know?
   - Where would you put 15 on this number line? How do you know?
   - What number would you place right here? (Point to a place.) How do you know?
   - How would you skip count to find places on this number line? (5, 10,…; count by fives) This is called the *interval*.

3. The teacher explains that the interval is different on the two strips. The *interval* tells how much each space on the number line represents. The interval on the first strip is one, and the interval on the second strip is five because you skip count by five to name the labeled places.

4. The teacher asks: Why is it important to know the interval that is being used on a number line before you put a number on the line?

5. The teacher shows the students the third number line (80 to 230, counting by 10’s) and asks questions such as:
• What is the interval on this strip? How do you know?
• How number would you place at the first mark?
• Label all the marks on the number line.
• What do the arrows tell you?

6. The teacher shows the fourth number line (0 to 30, counting by 2’s) and says:
• Find the two labeled numbers that are closest together on the number line. (18 and 22)
• What number comes halfway between them? (20)
• What is the interval?
• Where would 6 be located on this number line? How do you know?
• Where would you put 14 on this number line? How do you know?
• What number would you place right here? (Point to a place.) How do you know?
• Label all the marks on the number line.

7. The teacher gives the second In Between sheet to each student. The students follow the instructions for each number line.

**Journal Prompt:** Draw a number line with an interval of four that goes from 0 to 20. Draw another number line that starts with 50 and counts by 10’s to 100.
Write the numbers 3, 7, and 13 on this number line.

Write the numbers 4, 12, 13, and 26 on this number line.

Write the numbers 40, 75, and 81 on this number line.

Write the number that belongs where you see the A, B, and C.
**TEKS Student Expectation:**
The student is expected to use whole numbers to locate and name points on a line. (2.8A)

<table>
<thead>
<tr>
<th><strong>Materials</strong></th>
<th><strong>For Partners</strong></th>
<th><strong>Vocabulary</strong></th>
<th><strong>Warm-up</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td>For Partners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Number Lane Address Cards sheet, cut apart</td>
<td>- Number Lane Blank Address Cards sheet</td>
<td>- Odd</td>
<td>17 - 2 = 2 + □</td>
</tr>
<tr>
<td>- Number Lane Lots sheets, cut and taped together to make a street</td>
<td></td>
<td>- Even</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Number line</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we will do an activity using the addresses of houses on a street. The addresses of houses are like a number line. It is important to see the pattern of addresses to be able to find the house you may need.

1. The teacher says:
   - What is your address? House numbers are assigned in a pattern of odd and even numbers on opposite sides of the street. For example, if a house is numbered 402, the next door neighbors could have addresses that are 400 and 404. The houses across the street would have odd numbers.
   - If another house on this street has number 408, what are the neighbors’ addresses? (406 and 410)
   - Sometimes the pattern can go by 3’s or 5’s or some other pattern. Almost always odd numbers are on one side of a street and even numbers are across the street.

2. The teacher explains the activity.
   - The group will work together to place houses in the correct location on Number Lane.
   - Every lot has an address. Some of the lots do not have houses on them yet.

3. The houses are placed on Number Lane.
   - Students place the lowest numbered house in the lot at one end of the lane and the house with the highest number on the other end.
   - The teacher places the house with 619 next to 617 and asks students to tell what they think the pattern of house numbers will be on this side of Number Lane.
   - The other cards are mixed and placed in a pile face down.
   - The students take turns picking a card and placing the house in the correct lot. Some of the lots will be empty.
If a house has been misplaced, it can be moved to a more suitable lot by the player who notices the mistake.

4. After all the houses are placed on Number Lane, the students answer questions, such as:

- If you lived at 643 Number Lane, what would be the address of one of your next-door neighbors?
- If you lived at 633 Number Lane, what is the address of the house three doors down from where you live?
- If another house is built at the end of Number Lane, what would its address be?

5. Partners get a Number Lane Blank Address sheet and make up another pattern of addresses for one side Number Lane. They need to know that there are 16 lots and 12 houses, so some of the lots will be empty. They cut the houses apart.

6. The group repeats the activity, using each other’s address patterns.

**Journal Prompt:** How are street addresses like a number line?
<table>
<thead>
<tr>
<th>Number</th>
<th>Address Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>617</td>
<td>![Image of Address Card 617]</td>
</tr>
<tr>
<td>619</td>
<td>![Image of Address Card 619]</td>
</tr>
<tr>
<td>623</td>
<td>![Image of Address Card 623]</td>
</tr>
<tr>
<td>625</td>
<td>![Image of Address Card 625]</td>
</tr>
<tr>
<td>627</td>
<td>![Image of Address Card 627]</td>
</tr>
<tr>
<td>629</td>
<td>![Image of Address Card 629]</td>
</tr>
<tr>
<td>633</td>
<td>![Image of Address Card 633]</td>
</tr>
<tr>
<td>635</td>
<td>![Image of Address Card 635]</td>
</tr>
<tr>
<td>639</td>
<td>![Image of Address Card 639]</td>
</tr>
<tr>
<td>641</td>
<td>![Image of Address Card 641]</td>
</tr>
<tr>
<td>645</td>
<td>![Image of Address Card 645]</td>
</tr>
<tr>
<td>647</td>
<td>![Image of Address Card 647]</td>
</tr>
</tbody>
</table>
Number Lane

Number Lane Lots: Cut each of the sheets on the dotted lines and tape the four pieces together to make Number Lane.
Number Lane

Number Lane lots: Cut each of the sheets on the dotted lines and tape the four pieces together to make Number Lane.
Number Lane
Blank Address Cards
**TEKS Student Expectation:**
The student is expected to identify concrete objects that approximate standard units of length, capacity and weight. (2.9A)
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

**Materials**
For teacher
- 2 one-dollar bills
- Quarter
- Ruler

For group
- Construction paper, cut into strips
- Tape

For student
- Quarter
- Ruler
- Scissors

**Vocabulary**
- Benchmark
- Inch (in.)
- Foot (ft)
- Yard (yd)
- Length

**Warm-up**
Flower Power
37

**Activity:**
Today we are going to find everyday items that approximate 1 inch, 1 foot, and 1 yard. Benchmarks can help estimate lengths when we do not have actual measuring tools. For example, when we think about a certain length, we may remember something that we know is about that length.

1. The teacher shows the students a dollar bill and tells them that the length is about six inches. The teacher asks: If one foot is 12 inches, how many dollar bills does it take to equal one foot? Compare the length of two bills to a foot ruler.

2. The students use the two dollar bills and each makes a construction paper “foot.”

3. The teacher says that there are three feet in one yard. Students make three more construction paper feet and tape them together to make a yard.

4. The teacher shows the students a quarter and tells them the width of the quarter is approximately one inch. Compare the width of a quarter to an inch on the ruler.

5. The teacher asks the students to use the tools they have to locate common items in the classroom that are approximately one inch, one foot, and one yard. Students record their findings on a chart.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Items We Found</th>
</tr>
</thead>
<tbody>
<tr>
<td>About one inch</td>
<td></td>
</tr>
<tr>
<td>About one foot</td>
<td></td>
</tr>
<tr>
<td>About one yard</td>
<td></td>
</tr>
</tbody>
</table>

6. The group discusses the benchmarks they used for an inch, foot, and yard.

**Journal Prompt:** Explain how benchmarks are helpful in measurement.
**Lengthy String (Customary)**

**TEKS Student Expectation:**
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

<table>
<thead>
<tr>
<th><strong>Materials</strong></th>
<th></th>
<th><strong>Vocabulary</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td>Per student</td>
<td><strong>Function Machine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ruler</td>
<td>• Scissors</td>
<td>+9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Yardstick</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cotton string</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lengthy String (Customary) sheet</td>
<td></td>
<td><strong>Benchmark</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Inch (in.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Foot (ft)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Yard (yd)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Length</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we are going to find everyday items that approximate 1 inch, 1 foot, and 1 yard. It is helpful to have a benchmark to help estimate lengths when we do not have standard measuring tools.

1. The students use a ruler and a yardstick and cut string into 1-inch, 1-foot, and 1-yard lengths.

2. The teacher tells the students they will use their strings to locate items in the classroom that approximate the length of each string.

3. Students make a chart to record the items they find.

<table>
<thead>
<tr>
<th>Inch</th>
<th>Foot</th>
<th>Yard</th>
</tr>
</thead>
</table>

4. The group discusses which item they might want to remember as their benchmark for each length.

**Journal Prompt:** Which benchmarks are you going to use to remember 1 inch, 1 foot, and 1 yard?
**TEKS Student Expectation:**
The student is expected to identify concrete objects that approximate standard units of length, capacity and weight. (2.9A)
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>For group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Measuring tools for cup, pint, quart, gallon</td>
<td>• Benchmark</td>
<td>More or Less</td>
</tr>
<tr>
<td>• 2-3 collected containers that hold each measure above (See teacher note.)</td>
<td>• Capacity</td>
<td>Our number today is</td>
</tr>
<tr>
<td>• Rice, beans, or water</td>
<td>• Cup (c)</td>
<td>113.</td>
</tr>
<tr>
<td>Per pair</td>
<td>• Pint (pt)</td>
<td>Make it 30 more.</td>
</tr>
<tr>
<td>• Fill ‘er Up sheet</td>
<td>• Quart (qt)</td>
<td>Make it 100 less.</td>
</tr>
<tr>
<td>• Scoop</td>
<td>• Gallon (gal)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Estimate</td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we will measure the capacity of objects by finding out how much they can hold. We buy things in the grocery store that come in cups, pints, quarts, and gallons.

**Teacher Note:** The container collection needs to include multiple containers for each measure. You may wish to have students bring in containers such as milk cartons, jars, cups, soda bottles, etc. Be sure that each container you use is close to the standard measure. Randomly label the containers with letters A, B, C, etc.

1. The teacher shows the standard measuring tools for cup, pint, quart, and gallon and asks students to order them from greatest capacity to least capacity.

2. The teacher says: These standard measuring tools are labeled to show how much they hold. The cup, pint, quart, and gallon are customary measures of capacity.

3. The teacher shows the students the collection of containers labeled A, B, C, etc. The teacher selects container A and asks: How might we test to see how much this container holds?

4. The students work in pairs and sort all the collected containers by their capacity. Students can measure the containers in any order. Results are recorded on the Fill ‘er Up sheet.

5. The group discusses the results and checks their work.

6. The teacher asks:
   - When do we use cups, pints, quarts, and gallons? (cooking, buying milk, etc.)
   - What might you use a cup to measure? What might you measure in gallons?

**Journal Prompt:** Tell an item you would find at home that has the capacity of about one cup. Tell an item you would find at home that has the capacity of about a gallon.
Fill 'er Up (Customary)

<table>
<thead>
<tr>
<th>CONTAINER</th>
<th>Estimate the Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Circle the unit that is closest to the measurement of your object.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Container</th>
<th>Cup</th>
<th>Pint</th>
<th>Quart</th>
<th>Gallon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C</td>
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<td>D</td>
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<td>J</td>
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<td>K</td>
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<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TEKS Student Expectation:
The student is expected to identify concrete objects that approximate standard units of length, capacity and weight. (2.9A)
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

Materials
For teacher
• 1 one-pound canned good
• Classroom objects to compare to one pound (stapler, tissue box, tape, box of pencils, etc.)
For group
• Balance scale
Per student
• Too Heavy, Too Light sheet

Vocabulary
• Benchmark
• Weight
• Pound (lb)
• Estimate

Warm-up
Missing Addend
8 - □ = 2

Activity: Today we will use a one-pound benchmark and a balance scale to find out if objects are heavier, lighter, or about the same weight as one pound.

1. The teacher passes around the canned good and explains that it weighs about one pound. The can will be the benchmark for one pound. The students hold the can to get a feel for how heavy a pound is.

2. The teacher reminds students that pounds are used to measure the weight of objects.

3. The teacher introduces the balance scale and explains how it can be used to compare the weight of objects. The teacher places the one-pound can on one side of the balance scale and asks:
   • What happens if an item weighing less than the one-pound benchmark is placed on the other side of the scale?
   • What happens if an item weighing more than the one-pound benchmark is placed on the other side of the scale?
   • What happens if an item weighing the same as the one-pound benchmark is placed on the other side of the scale?

4. The teacher passes around an object and students estimate whether the object weighs more than a pound (too heavy), less than a pound (too light), or about one pound.

5. The students underline their predictions on the Too Heavy, Too Light sheet.

6. A student places the object on the scale. Students circle the outcome on the recording sheet and discuss their findings.

7. The process is repeated with the other objects.

Journal Prompt: Make a list of items that weigh about the same as a pound.
<table>
<thead>
<tr>
<th>Object</th>
<th>Is the object too heavy, too light, or about the same weight as a <strong>pound</strong>? Underline your prediction. Circle the outcome.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
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<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
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<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
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<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
<tr>
<td></td>
<td>Too Heavy  Too Light  About the Same</td>
</tr>
</tbody>
</table>
## TEKS Student Expectation:
The student is expected to identify concrete objects that approximate standard units of length, capacity and weight. (2.9A)
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

### Materials
For teacher
- 1 one-pound canned good
- 1 one-ounce snack bar
- Classroom objects (nickel, pencil, stapler, etc.)

Per student
- Weight for Me sheet (optional)

### Vocabulary
- Weight
- Ounce (oz)
- Pound (lb)
- Estimate

### Warm-up Likely/Unlikely
Sketch a bag having 6 blue, 5 red, and 2 yellow squares in it. Which color are you most likely to pull out? Why?

### Activity:
Many items are sold by their weight. Pounds and ounces are used. Today we are going to compare the weight of some classroom objects and determine if they should be weighed using pounds or ounces.

1. The teacher asks the students what it means to find out how much something weighs. The students share what they know.

2. The teacher passes around a one-pound canned good and says that it weighs approximately one pound. Next, the teacher passes around the one-ounce snack bar and says that it weighs approximately one ounce.

3. The teacher asks:
   - Which unit would you use to weigh something very light?
   - Which unit would you use to weigh something heavier?

4. The teacher passes around an object and asks the students to determine which unit, ounces or pounds, would more appropriately be used to measure it.

5. The students sort the other items into two groups: one group that would be measured using ounces and the other group most appropriately measured using pounds. (Do not say that an object must be weighed using only one type of unit. Any object can be weighed in either ounces or pounds. The point of this lesson is to help students differentiate between the lightness of an ounce and the relative heaviness of a pound.) Items may be recorded on the Weight for Me sheet, if desired.

6. As a group, students discuss their findings.

### Journal Prompt:
List two items you would find at home that you would weigh using pounds. List two items you would find at home that you would weigh using ounces.
<table>
<thead>
<tr>
<th>Object</th>
<th>What would you use?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Which unit would you use to measure the object?</td>
</tr>
<tr>
<td></td>
<td>Circle your answer.</td>
</tr>
<tr>
<td></td>
<td>Ounces</td>
</tr>
<tr>
<td></td>
<td>Ounces</td>
</tr>
<tr>
<td></td>
<td>Ounces</td>
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<td>Ounces</td>
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<td></td>
<td>Ounces</td>
</tr>
</tbody>
</table>
TEKS Student Expectation:
The student is expected to identify concrete objects that approximate standard units of length, capacity and weight. (2.9A)
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

Materials
For group
- Centimeter cubes
- Base ten longs
- Construction paper, cut into strips
- Tape

Vocabulary
- Benchmark
- Centimeter (cm)
- Meter (m)
- Length

Warm-up
Life Saver Math - 4

Activity: Today we are going to find everyday items that approximate 1 centimeter and 1 meter. People around the world use centimeters and meters to measure the length of objects.

1. The teacher explains that benchmarks are references we use to estimate measures. Benchmarks can be used to find out about how long something is without actually measuring.

2. The teacher gives students a centimeter cube and asks them to compare the width of the cube with the width of their little finger. The teacher says:
   - The cube is one centimeter wide and your little finger is a good benchmark for a centimeter.
   - How many centimeters are there in a base ten long?
   - If there are 100 centimeters is one meter, how many longs would it take to make one meter?

3. The students use the base ten longs and make a meter tape out of construction paper.

4. The teacher asks the students to locate common items in the classroom that are approximately one centimeter and one meter.

5. Students make a chart to record their findings.

<table>
<thead>
<tr>
<th>About one centimeter</th>
<th>About one meter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Journal Prompt: Identify an item you would measure in centimeters and an item you would measure in meters.
Lots of Liters (Metric)

**TEKS Student Expectation:**
The student is expected to identify concrete objects that approximate standard units of length, capacity and weight. (2.9A)
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

**Materials**
Per pair
- Empty one-liter bottles (or liter measuring tools)
- Collected containers that hold approximately one to four liters
- Rice, beans, or water

**Vocabulary**
- Capacity
- Liter (L)

**Warm-up**
Tell the Time
7:45

**Activity:** Today we will measure how many liters of water various containers will hold.

**Teacher Note:** Randomly label the collected containers with A, B, C, etc.

1. The teacher says:
   - We have several different containers. We will measure how many liters of water each of these can hold. How much the container can hold is called the capacity of the container.
   - The empty bottles each hold one liter of water.

2. The teacher selects one container and asks students to estimate how many liters it holds. The teacher models using a liter measure to find the capacity of the container.

3. Students work in partners to estimate and then measure how many liters each of the containers holds. (Containers can be measured in any order.) Results are recorded on a chart.

<table>
<thead>
<tr>
<th>Container</th>
<th>Estimated Liters</th>
<th>Liters</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. The group orders the containers from the least capacity to the greatest. The teacher asks if there is always a relationship between the height of a container and the amount of water it holds.

**Journal Prompt:** Name a container that can help you remember how much a liter is.
TEKS Student Expectation:
The student is expected to identify concrete objects that approximate standard units of length, capacity and weight. (2.9A)
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

Materials
For teacher
- 1 kg (2.2 lb) bag of rice or beans
- Classroom objects to compare to one kilogram (stapler, tissue box, tape, box of pencils, etc.)

For group
- Balance scale

Per student
- Too Heavy, Too Light sheet

Vocabulary
- Benchmark
- Weight
- Kilogram (kg)
- Customary
- Metric
- Estimate

Warm-up
Make it Equal
19 - □ = 5 + 5

Activity: Today we will use a one-kilogram benchmark and a balance scale to find out if objects are heavier, lighter, or weigh about the same as one kilogram.

1. The teacher explains that kilograms measure weight in the metric system.

2. The teacher passes around the bag of beans and explains that it weighs about one kilogram. The bag will be the benchmark for a kilogram. The students hold the bag to get a feel for how heavy a kilogram is.

3. The teacher explains how the balance scale can be used to compare the weight of objects. The teacher places the one-kilogram bag on one side of the balance scale and asks:
   - What happens if an item weighing less than the one-kilogram benchmark is placed on the other side of the scale?
   - What happens if an item weighing more than the one-kilogram benchmark is placed on the other side of the scale?
   - What happens if an item weighing about the same as the one-kilogram benchmark is placed on the other side of the scale?

4. The teacher passes around an object and students estimate whether the object weighs more than a kilogram (too heavy), less than a kilogram (too light), or about one kilogram. The students underline their predictions on the Too Heavy, Too Light sheet.

5. A student places the object on the scale. Students circle the outcome on the recording sheet and discuss their findings.

6. The process is repeated with the other objects.

Journal Prompt: Make a list of items that weigh about the same as a kilogram.
### Too Heavy, Too Light? (Metric)

<table>
<thead>
<tr>
<th>Object</th>
<th>Is the object too heavy, too light, or about the same weight as a <strong>kilogram</strong>? Underline your prediction. Circle the outcome.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too Heavy</td>
<td>Too Light</td>
</tr>
<tr>
<td>Too Heavy</td>
<td>Too Light</td>
</tr>
<tr>
<td>Too Heavy</td>
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<td>Too Heavy</td>
<td>Too Light</td>
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<tr>
<td>Too Heavy</td>
<td>Too Light</td>
</tr>
</tbody>
</table>
### TEKS Student Expectation:
The student is expected to identify concrete objects that approximate standard units of length, capacity and weight. (2.9A)
The student is expected to measure length, weight and capacity using concrete models that approximate standard units. (2.9B)

### Materials
<table>
<thead>
<tr>
<th>For teacher</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up Flower Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 paper clip</td>
<td>Weight for Me sheet (optional)</td>
<td>• Weight</td>
<td>50</td>
</tr>
<tr>
<td>1 kg (2.2 lb) bag of rice or beans</td>
<td></td>
<td>• Metric</td>
<td></td>
</tr>
<tr>
<td>Classroom objects</td>
<td></td>
<td>• Gram (g)</td>
<td></td>
</tr>
<tr>
<td>(nickel, pencil, stapler, etc.)</td>
<td></td>
<td>• Kilogram (kg)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Estimate</td>
<td></td>
</tr>
</tbody>
</table>

### Vocabulary
- Weight
- Metric
- Gram (g)
- Kilogram (kg)
- Estimate

### Activity: Many items are sold by their weight. Today we are going to compare the weight of some classroom objects and determine if they should be weighed using kilograms or grams.

1. The teacher asks the students what it means to find out how much something weighs. The students share what they know.

2. The teacher passes around a one-kilogram bag of rice or beans and says that it weighs approximately one kilogram. Next, the teacher passes around a paperclip and says that it weighs approximately one gram.

3. The teacher asks:
   - Which unit would you use to weigh something very light?
   - Which unit would you use to weigh something heavier?

4. The teacher passes around an object and asks the students to determine which unit, grams or kilograms, would more appropriately be used to measure it.

5. The students sort the other items into two groups: one group that would be measured using grams and the other group most appropriately measured using kilograms. (Do not say that an object must be weighed using only one type of unit. Any object can be weighed in either grams or kilograms. The point of this lesson is to help students differentiate between the lightness of a gram and the relative heaviness of a kilogram.) Items may be recorded on the Weight for Me Sheet, if desired.

6. As a group, students discuss their findings.

### Journal Prompt: Which unit would you use to measure the weight of your backpack? Explain why you would use that unit.
<table>
<thead>
<tr>
<th>Object</th>
<th>What would you use?</th>
<th>Which unit would you use to measure the object?</th>
<th>Circle your answer.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grams</td>
<td>Kilograms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grams</td>
<td>Kilograms</td>
<td></td>
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<td>Grams</td>
<td>Kilograms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grams</td>
<td>Kilograms</td>
<td></td>
</tr>
</tbody>
</table>
**TEKS Student Expectation:**
Read a thermometer to gather data. (2.10A)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Per student</th>
<th>Vocabulary</th>
<th>Warm-up Life Saver</th>
</tr>
</thead>
<tbody>
<tr>
<td>For teacher</td>
<td>• Real or demonstration thermometer</td>
<td>• Thermometer</td>
<td>+20</td>
</tr>
<tr>
<td></td>
<td>• Temperature’s Rising sheet, copied on heavy paper</td>
<td>• Temperature</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Scissors</td>
<td>• Degree</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Index card</td>
<td>• Increment</td>
<td></td>
</tr>
<tr>
<td>Per student</td>
<td>• Temperature’s Rising sheet, copied on heavy paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Scissors</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Index card</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Activity:** Today we will make model thermometers and use them to practice showing temperatures.

**Teacher Note:** We recommend teaching this lesson after students have learned how to use a number line. See lessons for 2.8.

1. The teacher shows a real or demonstration thermometer and asks questions appropriate to the thermometer used, such as:
   - What is the lowest temperature shown on the thermometer? The highest temperature?
   - Not every degree of temperature is numbered. Why do you think that might be so? The thermometer is numbered in *increments* which are in a skip counting pattern. What is the increment on this thermometer?

2. The teacher explains that a thermometer contains mercury or another liquid which expands and rises as the temperature heats up.

3. The teacher shows how to make the model thermometer as the students follow along:
   - Cut out the thermometer and the “mercury.”
   - Cut along the dotted lines at the top and bottom of the thermometer to make slits.
   - Insert the mercury into the slits.

4. The teacher says:
   - What is the lowest temperature shown on the thermometer? The highest temperature?
   - Not every degree of temperature is labeled. What is the increment on this thermometer?

5. The teacher instructs students to show one temperature that has a numbered mark and one temperature that is between numbered marks. For example:
   - Slide your mercury to show 42°. How do you know it is in the right place?
Temperature’s Rising

- Show 43°. How do you know it is in the right place?

6. Students take turns verbally giving each other temperatures to show.

7. The teacher shows the students how to write temperatures with the degree symbol.

8. Students each write a temperature with a degree symbol on an index card. They take turns showing their cards to others, who set their thermometers to match the temperature shown.

9. Students each set the mercury to show a temperature on the thermometer.

10. Students take turns showing their thermometers, and the other students record the temperature shown using the degree symbol.

Journal Prompt: Explain how the numbers on a thermometer are like a number line.
One-Handed Clocks

**TEKS Student Expectation:**
The student is expected to describe time on a clock using hours and minutes. (2.10B) The student is expected to describe activities that take approximately one second, one minute, and one hour. (2.9C)

### Materials
For teacher
- Demonstration clock
- Hour clock copied on cardstock and assembled with hand
- Minute clock copied on cardstock and assembled with hand
- Brads to hold hands on clock

### Vocabulary
- Hour
- Minute
- Second

### Warm-up Function Machine
+ 10

### Activity:
Today we are going to tell time on one-handed clocks. We will discuss the purpose of each of the hands so it will be easier to use the clock.

1. The teacher asks:
   - How long is a minute? What can you do in a minute?
   - How long is an hour? What can you do in an hour?
   - How long is a second? What can you do in a second?

2. The teacher refers to the classroom clock and asks:
   - Which hand keeps track of how many minutes are going by?
   - Which hand keeps track of how many hours are going by?

3. The teacher holds up the hour clock with the hand set between 2 and 3 and tells the students that this clock only has an hour hand and asks:
   - About what time is it? How do you know?
   - Where would this hand be if it were 4:00? 4:30? 5:00?
   - Are the numbers on the clock important when keeping track of hours? Why or why not? (Yes. They tell you what hour it is close to.)
   - How far does the hour hand move while you eat lunch?

4. The teacher holds up the minute clock with the hand set between 2 and 3 and asks:
   - About how many minutes is it past the hour? How do you know?
   - Where would this minute hand be if it were 4:00? 4:15? 4:30?
One-Handed Clocks

- Are the numbers on the clock important when keeping track of minutes? (Yes. They help keep track of sets of five minutes.)

- How far would this hand move while you eat lunch?

5. The teacher holds up the demonstration clock and says:

- This clock has hands that keep track of different things. When we tell time we need to tell about the hour hand and minute hand.

- Most of the time we start by telling about the hour and then the minute. For example, we say “two twenty” (2:20).

- But sometimes we tell about the minutes first and then the hour. For example, we could say “20 minutes after 2:00.”

6. The students practice setting the demonstration clock at different times and saying the time. For example: Show 9 o’clock, then show 10 minutes after 9, then show 9:25.

Journal Prompt: Explain the job of each hand on the clock.
One-Handed Clocks

Hour Clock
Who Can?

**TEKS Student Expectation:**
The student is expected to describe time on a clock using hours and minutes. (2.10B)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per pair</td>
<td>Per student</td>
<td>Life Saver Math</td>
</tr>
<tr>
<td>● Demonstration clock</td>
<td>● Who Can? cards, cut apart</td>
<td>- 10</td>
</tr>
</tbody>
</table>

**Activity:** Today we will practice showing the time on a clock in hours and minutes.

1. The teacher places the cards face down in a draw pile.

2. The teacher begins the game by drawing a card and reading it. For example: Who can show 8:10?

3. The teacher calls on a student who can show the time. Using a demonstration clock, the student moves the hands to the correct position.

4. If the student is correct, the student draws a card, reads it, and calls on another student to show the time.

5. Play continues until all of the cards have been played.

**Journal Prompt:** Pull one card. Write the time and draw a clock showing the time.
<table>
<thead>
<tr>
<th>Who can show</th>
<th>Who can show</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:50?</td>
<td>3:45?</td>
</tr>
<tr>
<td>12:20?</td>
<td>9:55?</td>
</tr>
<tr>
<td>6:30?</td>
<td>7:15?</td>
</tr>
<tr>
<td>8:45?</td>
<td>12:35?</td>
</tr>
<tr>
<td>Who can show 9:15?</td>
<td>Who can show 10:00?</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Who can show 2:45?</td>
<td>Who can show 1:10?</td>
</tr>
<tr>
<td>Who can show 4:05?</td>
<td>Who can show 6:40?</td>
</tr>
<tr>
<td>Who can show 7:25?</td>
<td>Who can show 11:30?</td>
</tr>
</tbody>
</table>
### TEKS Student Expectation:
The student is expected to describe time on a clock using hours and minutes. (2.10B)

<table>
<thead>
<tr>
<th>Materials For group</th>
<th>Vocabulary</th>
<th>Warm-up More or Less</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tic-Tac-Toe Time cards, cut apart</td>
<td>O’clock</td>
<td>Our number today is 998. Make it 1 more. Make it 60 less.</td>
</tr>
</tbody>
</table>

### Activity:
Today we will practice telling time on a clock while we play tic-tac-toe in teams.

1. The teacher draws a large tic-tac-toe board and divides the group into two teams – X’s and O’s. The Tic-Tac-Toe Time cards are shuffled and placed in a stack.

2. The teacher says: The teams will take turns. On your team’s turn, pick any clock to read. If you read the time correctly, your team can place your X or O on the tic-tac-toe board.

3. The teams take turns. The winner is the team who can place three X’s or three O’s in a row.

### Journal Prompt:
Choose one clock card. Draw the clock and tell something that you do at that time of day.
Tic-Tac-Toe Time
Graph It With Pictures

**TEKS Student Expectation:**
The student is expected to construct picture and bar-type graphs. (2.11A)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Vocabulary</th>
<th>Warm-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For group</strong></td>
<td><strong>Survey</strong></td>
<td><strong>Tell the Time</strong></td>
</tr>
<tr>
<td>• Graph It With Pictures cards, cut apart (survey questions and picture graphs)</td>
<td>• Picture graph</td>
<td>9:15</td>
</tr>
<tr>
<td></td>
<td>• Data</td>
<td></td>
</tr>
</tbody>
</table>

**Vocabulary**
- Survey
- Picture graph
- Data

**Activity:** Picture graphs use pictures to represent information. Today we are going to match data about some of our favorite things with picture graphs.

1. The teacher says:
   - There are four survey questions: What is your favorite season? favorite sport? favorite recess activity? favorite candy? (Show the survey cards.) Each survey card has tally marks to show people’s answers to the question. For each survey there are four picture graphs. Only one picture graph correctly matches the survey results.
   - Work with a partner. Select a survey question card and find the picture graph card that correctly matches the data on the survey.

2. The group discusses the results.

3. Select a graph and ask students to provide summary statements about the information. For example, for the favorite seasons graph, students might state:
   - Six students like summer best.
   - Seven students like fall and winter.
   - 18 students answered the survey about their favorite season.
   - Winter is the least favorite season.
   - The same number of students chose fall and winter as their favorite season.
   - Three times as many students like summer as like winter.

**Journal Prompt:** Select a graph and write three statements about the data shown.
### Survey Question: What is your favorite season?

<table>
<thead>
<tr>
<th></th>
<th>fall</th>
<th>winter</th>
<th>spring</th>
<th>summer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>II</td>
<td>IIII</td>
<td>III</td>
</tr>
</tbody>
</table>

### Survey Question: What is your favorite sport?

<table>
<thead>
<tr>
<th></th>
<th>Baseball</th>
<th>Soccer</th>
<th>Football</th>
<th>Basketball</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IIII</td>
<td>IIII</td>
<td>IIII</td>
<td>III</td>
</tr>
</tbody>
</table>

### Survey Question: What is your favorite recess activity?

<table>
<thead>
<tr>
<th></th>
<th>Merry-go-round</th>
<th>Swings</th>
<th>Slide</th>
<th>See Saw</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
<td>IIII</td>
<td>IIII</td>
<td>II</td>
</tr>
</tbody>
</table>

### Survey Question: What is your favorite candy?

<table>
<thead>
<tr>
<th></th>
<th>hard candy</th>
<th>gum</th>
<th>chocolates</th>
<th>fruit chews</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IIII</td>
<td>IIII</td>
<td>IIII</td>
<td>IIII</td>
</tr>
</tbody>
</table>
Graph It With Pictures
Picture Graphs

Number of Students
Picture Graph

Number of Students
Picture Graph

Number of Students
Picture Graph

Number of Students
Picture Graph
Graph It With Pictures

Picture Graphs

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Picture Graph</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Picture Graph</th>
</tr>
</thead>
<tbody>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Picture Graph</th>
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</table>

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Picture Graph</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Graph It With Pictures
Picture Graphs

Number of Students
Picture Graph

Number of Students
Picture Graph

Number of Students
Picture Graph

Number of Students
Picture Graph
Graph It With Pictures
Picture Graphs

Number of Students
Picture Graph

Number of Students
Picture Graph

Number of Students
Picture Graph

Number of Students
Picture Graph
Questions and Answers, Part 1

TEKS Student Expectation:
The student is expected to draw conclusions and answer questions based on picture graphs and bar-type graphs. (2.11B)

Materials
Per pair
- Questions and Answers, Part 1 graph

Vocabulary
- Picture graph
- Data

Warm-up
Missing Addend
\(6 + \square = 13\)

Activity: Today you will answer questions using data from a picture graph. It is important to be able to interpret graphs to learn more about the data collected.

1. The teacher asks questions about the pizza graph, such as:
   - What kind of graph is it?
   - What is the title of the graph?
   - What information is shown on the graph?
   - What does each slice of pizza on the graph mean?
   - How many people chose each kind of pizza as their favorite?

2. The teacher asks questions that involve using two or more sets of data from the graph to answer the question, such as:
   - How many more children like sausage pizza than vegetable pizza? (2)
   - What number sentence shows the solution to the question? (4 – 2 = 2)
   - How many children chose either cheese pizza or pepperoni pizza? (13)
   - What number sentence shows the solution? (6 + 7 = 13)

3. The teacher tells students they will work in pairs to write more questions that can be answered from the graph. The questions should involve more than one piece of information (like the questions in step 2). The group works together to write a few sample questions so that directions are understood.

4. Students work in pairs to write three new questions about the graph.

5. The group works together to answer all of the questions. Each time, a related number sentence is recorded.

Journal Prompt: Write a question that can be answered from the pizza graph. Write a number sentence to answer the question.
Favorite Pizza Topping

<table>
<thead>
<tr>
<th>Cheese</th>
<th>Sausage</th>
<th>Mushroom</th>
<th>Vegetable</th>
<th>Pepperoni</th>
<th>Canadian Bacon</th>
</tr>
</thead>
</table>

Kind of Topping

Each slice of pizza represents 1 person.
TEKS Student Expectation:
The student is expected to draw conclusions and answer questions based on picture graphs and bar-type graphs. (2.11B)

Materials
Per pair
• Questions and Answers, Part 2 graph

Vocabulary
• Bar graph
• Data

Warm-up Likely/Unlikely
Sketch a bag having 3 blue, 1 red, and 3 yellow squares in it. Which color are you least likely to pull out? Why?

Activity: Today you will answer questions using data from a bar graph. It is important to be able to interpret graphs to learn more about the data collected.

1. The teacher asks questions about the pet graph, such as:

   • What kind of graph is it?
   • What is the title of the graph?
   • What information is shown on the graph?
   • What do the numbers mean?
   • How many students picked fish as their favorite? Dog? Cat? …

2. The teacher asks questions that involve using two or more sets of data from the graph to answer the question, such as:

   • How many more children own dogs than birds? (8)
   • What number sentence shows the solution to the question? (16 – 8 = 8)
   • How many students picked either fish or birds as their favorite? (12)
   • What number sentence shows the solution? (4 + 8 = 12)

3. The teacher tells students they will work in pairs to write more questions that can be answered from the graph. The questions should involve more than one piece of information (like the questions in step 2). The group works together to write a few sample questions so that directions are understood.

4. Students work in pairs to write three new questions about the graph.

5. The group works together to answer all of the questions. Each time, a related number sentence is recorded.

Journal Prompt: Write a question that can be answered from the pet graph and write a number sentence to answer the question.
Our Favorite Pets

Number of Students

Pets

- Fish: 4
- Dog: 16
- Cat: 14
- Bird: 8
- Horse: 2