



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

<div style="border: 1px solid black; border-radius: 15px; padding: 10px; display: inline-block;"> <h3 style="margin: 0;">1.OA.1</h3> </div>	<p>Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. See Table 1, page 95.</p>	<p style="text-align: center;">Common Misconceptions</p> <p>Many children misunderstand the meaning of the equal sign. The equal sign means “is the same as” but most primary students believe the equal sign tells you that the “answer is coming up” to the right of the equal sign. This misconception is over-generalized by only seeing examples of number sentences with an operation to the left of the equal sign and the answer on the right. First graders need to see equations written multiple ways, for example $5 + 7 = 12$ and $12 = 5 + 7$. Students may believe that addition is always “put together” and subtraction is always “take away”. By moving the unknown to a variety of positions, students will not be limited to this understanding. They will be able to solve for the change in numbers and the initial unknown.</p>	<p style="text-align: center;">Academic Vocabulary/Language</p> <ul style="list-style-type: none"> ▪ part ▪ add ▪ whole ▪ equals = ▪ sum ▪ plus + ▪ number sentence ▪ subtract ▪ difference ▪ minus – <p style="text-align: center;">Tier 2</p> <ul style="list-style-type: none"> ▪ solve ▪ compare ▪ represent
<p style="text-align: center;">Essential Understandings</p> <ul style="list-style-type: none"> • Real-world mathematical situations can be represented using objects, drawings, and equations. • An unknown can be in any position of a mathematical situation. 	<p>Learning Targets</p> <p>I can solve word problems using addition and subtraction within 20.</p> <p>I can solve four types of problems: add to, take from, put together/take apart, and compare with an unknown in any position.</p> <p>I can solve problems using objects, drawings, and equations.</p>		

Classroom Snapshot

Examples

Students will experience an unknown value in the total, one addend, or both addends.

Change unknown and addend unknown problems help students begin to see subtraction as the opposite of addition.

Adapted from Darke County Schools and North Carolina Public School Wikispaces

Questions

I have a vase with 15 flowers. Mom put more flowers in the vase. Now there are 19 flowers in the vase. How flowers did Mom put into the vase?

Sam saw seven birds in a tree. Two of the birds flew away. Write an equation to find how many birds are left in the tree.

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Collaborate in small groups to develop problem-solving strategies using a variety of models such as drawings, words, and equations with symbols for the unknown numbers to find the solutions. Additionally students need the opportunity to explain, write and reflect on their problem-solving strategies. The situations for the addition and subtraction story problems should involve sums and differences less than or equal to 20 using the numbers 0 to 20. They need to align with the addition and subtraction situations found in Table 1 of the Ohio Department of Education Model Curriculum 2017.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

TABLE 1. COMMON ADDITION AND SUBTRACTION SITUATIONS.

	RESULT UNKNOWN	CHANGE UNKNOWN	START UNKNOWN
ADD TO	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? $2 + 3 = ?$	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? $2 + ? = 5$	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? $? + 3 = 5$
TAKE FROM	Five apples were on the table. I ate two apples. How many apples are on the table now? $5 - 2 = ?$	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? $5 - ? = 3$	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? $? - 2 = 3$
	TOTAL UNKNOWN	ADDEND UNKNOWN	BOTH ADDENDS UNKNOWN ¹
PULL TOGETHER/ TAKE APART²	Three red apples and two green apples are on the table. How many apples are on the table? $3 + 2 = ?$	Five apples are on the table. Three are red and the rest are green. How many apples are green? $3 + ? = 5, 5 - 3 = ?$	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$
	DIFFERENCE UNKNOWN	BIGGER UNKNOWN	SMALLER UNKNOWN
COMPARE³	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? $2 + ? = 5, 5 - 2 = ?$	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? $2 + 3 = ?, 3 + 2 = ?$	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? $5 - 3 = ?, ? + 3 = 5$

¹ These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean "makes" or "results in" but always does mean "is the same number as."

Connections Across Standards

Interpret data to answer questions about how many more or how many less (1.MD.4).

Use place value understanding to add and subtract (1.NBT.4).

Use properties of operations to add and subtract (1.OA.3-4).

Add and subtract within 20 (1.OA.6).

Understand the equal sign (1.OA.7).

Determine the unknown whole number in an addition or subtraction equation (1.OA.8).

K.OA.2 (Prior Grade Standard)

Solve addition and subtraction problems (written or oral), and add and subtract within 10 by using objects or drawings to represent the problem.

2.OA.1 (Future Grade Standard)

Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. See Table 1, page 95.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.OA.2

Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations

with a symbol for the unknown number to represent the problem. Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)

Essential Understandings

- Real-world mathematical situations can be represented using objects, drawings, and equations.
- An unknown can be in any position of a mathematical situation.
- Mathematical situations can include multiple addends.

Common Misconceptions

A misconception that many students have is that it is valid to assume that a key word or phrase in a problem suggests the same operation will be used every time. For example, they might assume that the word left always means that subtraction must be used to find a solution. Providing problems in which key words like this are used to represent different operations is essential. For example, the use of the word left in this problem does not indicate subtraction as a solution method: Seth took the 8 stickers he no longer wanted and gave them to Anna. Now Seth has 11 stickers left. How many stickers did Seth have to begin with? Students need to analyze word problems and avoid using key words to solve them.

Academic

Vocabulary/Language

- part
- add
- whole
- equals =
- sum
- plus +
- number sentence

Tier 2

- solve
- compare
- represent

Learning Target

I can solve word problems that add three numbers that have a sum less than or equal to 20, with a symbol for the unknown.

I can solve problems using objects, drawings, and equations.

Classroom Snapshot

Examples

Connections can be made to the properties of addition to provide student opportunities to develop strategies for addition.

Students need experiences with concrete models and pictures before writing equations.

Questions

Lucy has 6 animal stickers, 3 star stickers, and 7 cat stickers. How many stickers does Lucy have?

Pam has 3 balls, John has 2 balls and Sue 5 balls. If they put them altogether, how many will there be?

Adapted from Darke County Schools and North Carolina Public Schools Wikispaces

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Students need the opportunity of writing and solving story problems involving three addends with a sum that is less than or equal to 20. For example, each student writes or draws a problem in which three whole things are being combined. The students exchange their problems with other students, solving them individually and then discussing their models and solution strategies. Now both students work together to solve each problem using a different strategy.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Interpret data to answer questions about how many more or how many less (1.MD.4).

Use place value understanding to add and subtract (1.NBT.4).

Use properties of operations to add and subtract (1.OA.3-4).

Add and subtract within 20 (1.OA.6).

Understand the equal sign (1.OA.7).

Determine the unknown whole number in an addition or subtraction equation (1.OA.8).

K.OA.2 (Prior Grade Standard)

Solve addition and subtraction problems (written or oral), and add and subtract within 10 by using objects or drawings to represent the problem.

2.OA.1 (Future Grade Standard)

Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. See Table 1, page 95.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.OA.3

Apply properties of operations as strategies to add and subtract. For example, if $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known (Commutative Property of Addition); to add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$ (Associative Property of Addition). Students need not use formal terms for these properties.

Essential Understandings

- The order of numbers in addition does not change the sum.
- The numbers in an addition problem can be rearranged or regrouped without changing the sum. For example, $6 + 7 = 10 + 3$ is a use of the associative property where the numbers are regrouped rather than being rearranged.

Common Misconceptions

A common misconception is that the commutative property applies to subtraction. After students have discovered and applied the commutative property for addition, ask them to investigate whether this property works for subtraction. Have students share and discuss their reasoning and guide them to conclude that the commutative property does not apply to subtraction.

Academic

Vocabulary/Language

- add
 - part
 - whole
 - equals =
 - sum
 - plus +
 - number sentence
 - subtract
 - difference
 - minus –
- Tier 2**
- apply

Learning Targets

I can switch the two numbers in an addition problem and the answer will stay the same (Commutative Property).
 I can change the order that I add numbers in an addition problem and the answer will stay the same (Associative Property).

Classroom Snapshot

Examples

If you know $3 + 8 = 11$, then we also know that $8 + 3 = 11$.

We can solve $2 + 6 + 4$ in two ways. By adding the $2 + 6$ first ($8 + 4$) or adding the $6 + 4$ first ($2 + 10$).

Adapted from Darke County Schools and North Carolina Public Schools Wikispaces

Questions

Use two different colors of linking cubes to make as many combinations of the number 8 as possible.

There are 5 red jelly beans, 4 green jelly beans, and 5 black jelly beans. How many jelly beans are there in all?

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

One focus in this cluster is for students to discover and apply the commutative and associative properties as strategies for solving addition problems. Students do not need to learn the names for these properties. It is important for students to share, discuss and compare their strategies as a class. The second focus is using the relationship between addition and subtraction as a strategy to solve unknown-addend problems. Students naturally connect counting on to solving subtraction problems. For the problem " $15 - 7 = ?$ " they think about the number they have to add to 7 to get to 15. First graders should be working with sums and differences less than or equal to 20 using the numbers 0 to 20.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Solve problems using three addends (1.OA.2).

Add and subtract within 20 (1.OA.6).

Understand the equal sign (1.OA.7).

Determine the unknown whole number in an addition or subtraction equation (1.OA.8).

There is a relationship between addition and subtraction (1.NBT.4).

K.OA.3 (Prior Grade Standard)

Decompose numbers and record compositions for numbers less than or equal to 10 into pairs in more than one way by using objects and, when appropriate, drawings or equations.

2.NBT.5 (Future Grade Standard)

Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

<div style="border: 1px solid black; border-radius: 15px; padding: 10px; display: inline-block;"> <h3 style="margin: 0;">1.OA.4</h3> </div>	<p>Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.</p>	<p style="text-align: center;">Common Misconceptions</p> <p>Students do not understand that unknowns can be found in in any position. Often students are only exposed to equations with the unknown after the equals sign. (i.e. $10 - 8 = ?$) Students should be exposed to strategies for solving unknowns in all positions. ($8 + ? = 10$ can be solved by using $10 - 8 = ?$)</p>	<p style="text-align: center;">Academic Vocabulary/Language</p> <ul style="list-style-type: none"> ▪ part ▪ add ▪ whole ▪ equals = ▪ sum ▪ plus + ▪ number sentence ▪ subtract ▪ difference ▪ minus – ▪ addends <p style="text-align: center;">Tier 2</p> <ul style="list-style-type: none"> ▪ apply ▪ solve
<p style="text-align: center;">Essential Understanding</p> <ul style="list-style-type: none"> • The relationship between addition and subtraction allows solving for unknowns in any position. 			
<p>Learning Target</p>	<p>I can solve a subtraction problem, with an unknown in any position, by using the relationship between addition and subtraction.</p>		

Classroom Snapshot

Examples

To solve $10 - 8$, think $8 + ? = 10$.

To solve $15 - 9 = ?$, think “I’ll start with 9. I need one more to make 10. Then I need 5 more to make 15.

That’s 1 and 5 so it’s 6. $15 - 9 = 6$.

Questions

Francisco was making cards for his 12 friends. He already made 4 cards. How many cards does Francisco still need to make?

Student A: *I started at 4 and added up to 12 ($4 + \underline{\quad} = 12$)*

Student B: *I thought about subtraction problem ($12 - 4 = \underline{\quad}$).*

Adapted from Darke County Schools and North Carolina Public Schools Wikispaces

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Provide multiple opportunities for students to study the relationship between addition and subtraction in a variety of ways, including games, modeling and real-world situations. Students need to understand that addition and subtraction are related, and that subtraction can be used to solve problems where the addend is unknown.

Ohio’s New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Solve problems using three addends (1.OA.2).

Add and subtract within 20 (1.OA.6).

Understand the equal sign (1.OA.7).

Determine the unknown whole number in an addition or subtraction equation (1.OA.8).

There is a relationship between addition and subtraction (1.NBT.4).

K.OA.4 (Prior Grade Standard)

For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or, when appropriate, an equation.

2.OA.2 (Future Grade Standard)

Fluently ^G add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. See standard 1.OA.6 for a list of mental strategies.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.OA.5

Relate counting to addition and subtraction, e.g., by counting on^G 2 to add 2.

Essential Understandings

- Addition occurs when counting forward.
- Subtraction occurs when counting back.
- Addition and subtraction are related (inverse operations).

Common Misconceptions

Students understand the concept of addition and subtraction as it pertains to counting concrete objects. Teachers need to provide instructional experiences so that students progress from the concrete level (manipulatives), to the pictorial level, then to the abstract (expressions/equations) level when learning mathematical concepts. This progression allows students to grasp the concept of counting on and counting back as it relates to addition and subtraction.

Academic Vocabulary/Language

- count on
 - count back
 - equals =
 - sum
 - plus +
 - number sentence
 - difference
 - minus –
 - addends
 - number line
- Tier 2**
- explain

Learning Target

I can explain how counting forward and backward relates to addition and subtraction strategies such as counting on 2 means adding 2 or counting back 3 means to subtract 3.

Classroom Snapshot

Examples

To solve $5 + 2$, think "I will start at 5 and count forward 6, 7" to get the answer.

To solve $12 - 5$, think "I will start at 12 and count backwards 11, 10, 9, 8, 7" to get the answer.

Questions

What is 2 more than 49?

What is 2 less than 95?

Adapted from Darke County Schools and Howard County Public Schools

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Provide numerous opportunities for students to use the counting on strategy for solving addition and subtraction problems. For example, provide a ten frame showing 5 colored dots in one row. Students add 3 dots of a different color to the next row and write $5 + 3$. Ask students to count on from 5 to find the total number of dots. Then have them add an equal sign and the number eight to $5 + 3$ to form the equation $5 + 3 = 8$. Ask students to verbally explain how counting on helps to add one part to another part to find a sum. Discourage students from inventing a counting back strategy for subtraction because it is difficult and leads to errors.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Real-world mathematical situations can be represented using objects, drawings, and equations (1.OA.1).

The order of numbers in addition does not change the sum (1.OA.3).

Determine the unknown whole number in an addition or subtraction equation (1.OA.8).

Interpret data to answer questions about how many more or how many less (1. MD.4).

Use the relationship between addition and subtraction (1.NBT.4).

K.OA.2 (Prior Grade Standard)

Solve addition and subtraction problems (written or oral), and add and subtract within 10 by using objects or drawings to represent the problem.

2.OA.2 (Future Grade Standard)

Fluently ^G add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. See standard 1.OA.6 for a list of mental strategies.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.OA.6

Add and subtract within 20, demonstrating fluency ^G with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$; decomposing a number leading to a ten, e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$; using the relationship between addition and subtraction, e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$; and creating equivalent but easier or known sums, e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$.

Essential Understandings

- Addition and subtraction are related (inverse operations).
- Fluency means being efficient, accurate, and flexible with addition and subtraction strategies.

Common Misconceptions

Students often do not realize that there are many different ways to solve addition and subtraction equations. By giving students manipulatives and math tools such as ten frames and number lines, they can explore the different ways to add and subtract numbers. Once students are successful using the manipulatives/tools, they can move to pictorial and then numerical representations. When students show an understanding of the relationships between addition and subtraction they can choose efficient strategies to demonstrate fluency.

Academic Vocabulary/Language

- equals =
 - sum
 - plus +
 - number sentence
 - difference
 - minus –
 - addends
- Tier 2**
- compare

Learning Targets

I know of variety of strategies for adding and subtracting numbers within 20.
I can efficiently and accurately add and subtract numbers within 10.

Classroom Snapshot

Examples

$$8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$$

$$13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$$

Knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$.

Without any external assistance and without mentally counting, they can recite the addition and subtraction facts within 10.

Adapted from Darke County Schools and Howard County Schools

Questions

Find the sum of $6 + 7$. What strategy did you use?

Find the sum of $14 + 6$. Does the making 10 strategy help you? Explain.

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Provide multiple and varied experiences that will help students develop a strong sense of numbers based on comprehension – not rules and procedures. Number sense is a blend of comprehension of numbers and operations and fluency with numbers and operations. Students gain computational fluency (using efficient and accurate methods for computing) as they come to understand the role and meaning of arithmetic operations in number systems.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Real-world mathematical situations can be represented using objects, drawings, and equations (1.OA.1).

The order of numbers in addition does not change the sum (1.OA.3).

Determine the unknown whole number in an addition or subtraction equation (1.OA.8).

Interpret data to answer questions about how many more or how many less (1. MD.4).

Use the relationship between addition and subtraction (1.NBT.4).

K.OA.5 (Prior Grade Standard)

Fluently ^G add and subtract within 5.

2.OA.2 (Future Grade Standard) 2nbt5I

Fluently ^G add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. See standard 1.OA.6 for a list of mental strategies.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.OA.7

Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$; $7 = 8 - 1$; $5 + 2 = 2 + 5$; $4 + 1 = 5 + 2$.

Essential Understandings

- An equal sign represents a relationship between two mathematical expressions.
- To be a true equation, quantities on both sides of the equal sign must have the same value.
- The total can go on the right or left side of the equal sign.

Common Misconceptions

Many children misunderstand the meaning of the equal sign. The equal sign means “is the same as” but most primary students believe the equal sign tells you that the “answer is coming up” to the right of the equal sign. This misconception is over-generalized by only seeing examples of number sentences with an operation to the left of the equal sign and the answer on the right. First graders need to see equations written multiple ways, for example $5 + 7 = 12$ and $12 = 5 + 7$. Students may believe that addition is always “put together” and subtraction is always “take away”. By moving the unknown to a variety of positions, students will not be limited to this understanding. They will be able to solve for the change in numbers and the initial unknown.

Academic Vocabulary/ Language

- true
- false
- equals =
- sum
- plus +
- equation
- difference
- minus –
- addends

Tier 2

- solve
- explain

Learning Targets	I know the equal sign means "the same as" and does not just mean an answer follows. I can determine if an equation is true or false even when written in a variety of ways.
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Classroom Snapshot	
Examples	Questions
<p>$6 = 6$; $7 = 8 - 1$; $5 + 2 = 2 + 5$; $4 + 1 = 5 + 2$.</p> <p>$7 = 8 - 1$ is true because 7 is the same as $8 - 1$.</p> <p>$2 + 3 = 5 - 1$ is false because $2 + 3$ is 5, which is not the same as $5 - 1$.</p>	<p>Does $4 + 2 = 5 + 1$? How do you know?</p> <p>Jason said $11 = 13 - 4$ was correct. Is he right? How do you know?</p>
Adapted from Darke County Schools and Howard County Schools	
Ohio Department of Education Model Curriculum Instructional Strategies and Resources	
Provide opportunities for students use objects of equal weight and a number balance to model equations for sums and differences less than or equal to 20 using the numbers 0 to 20. Give students equations in a variety of forms that are true and false. Include equations that show the identity property, commutative property of addition, and associative property of addition. Students need not use formal terms for these properties.	
13 = 13 Identity Property	
8 + 5 = 5 + 8 Commutative Property for Addition	
3 + 7 + 4 = 10 + 4 Associative Property for Addition	
Ask students to determine whether the equations are true or false and to record their work with drawings. Students then compare their answers as a class and discuss their reasoning.	
Ohio’s New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)	
Connections Across Standards	
Compare numbers using symbols (1.NBT.3).	
Represent addition and subtraction with unknowns in all positions (1.OA.1).	
Fluently add and subtract (1.OA.6).	
Compare and compute with data (1.MD.4).	
K.OA.1(Prior Grade Standard)	2.NBT.4 (Future Grade Standard)
Represent addition and subtraction with objects, fingers, mental images, drawings, sounds such as claps, acting out situations, verbal	

explanations, expressions, or equations. Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)

Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.OA.8

Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. For example, determine the unknown

number that makes the equation true in each of the equations $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$.

Essential Understandings

- An equal sign represents a relationship between two mathematical expressions.
- To be a true equation, quantities on both sides of the equal sign must have the same value.
- The total can go on the right or left side of the equal sign.
- An equation can have an unknown in any position.

Common Misconceptions

Many children misunderstand the meaning of the equal sign. The equal sign means “is the same as” but most primary students believe the equal sign tells you that the “answer is coming up” to the right of the equal sign. This misconception is over-generalized by only seeing examples of number sentences with an operation to the left of the equal sign and the answer on the right. First graders need to see equations written multiple ways, for example $5 + 7 = 12$ and $12 = 5 + 7$. Students may believe that addition is always “put together” and subtraction is always “take away”. By moving the unknown to a variety of positions, students will not be limited to this understanding. They will be able to solve for the change in numbers and the initial unknown.

Academic Vocabulary/Language

- addends
- equals =
- sum
- plus +
- equation
- difference
- minus –

Tier 2

- solve
- explain

Learning Target

I can find the missing number in any equation that has two other numbers given in an addition or subtraction equation.

Classroom Snapshot**Examples**

$$5 = _ - 3$$

$$8 + ? = 11$$

Questions

Five cookies were on the table. I ate some cookies. Then there were 3 cookies. How many cookies did I eat?

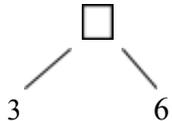
Use the digits 3, 4, 5, 6 and 7 to make the equations true.

$$\begin{array}{lll} _ + 6 = 12 & 5 - _ = 2 & 4 = _ - 3 \\ 6 = 2 + _ & 13 - _ = 8 & \end{array}$$

Adapted from Darke County Schools, North Carolina Public Schools Wikispaces and Howard County Public Schools

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

The Math Mountain shows a sum with diagonal lines going down to connect with the two addends, forming a triangular shape. It shows two known quantities and one unknown quantity. Use various symbols, such as a square, to represent an unknown sum or addend in a horizontal equation. For example, here is a Take from / Start Unknown problem situation such as: Some markers were in a box. Matt took 3 markers to use. There are now 6 markers in the box. How many markers were in the box before? The teacher draws a square to represent the unknown sum and diagonal lines to the numbers 3 and 6.



Have students practice using the Math Mountain to organize their solutions to problems involving sums and differences less than or equal to 20 with the numbers 0 to 20. Then ask them to share their reactions to using the Math Mountain.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Compare numbers using symbols (1.NBT.3).

Represent addition and subtraction with unknowns in all positions (1.OA.1).

Fluently add and subtract (1.OA.6).

Compare and compute with data (1.MD.4).

K.OA.2 (Prior Grade Standard)

Solve addition and subtraction problems (written or oral), and add and subtract within 10 by using objects or drawings to represent the problem.

2.OA.1 (Future Grade Standard)

Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. See Table 1, page 95.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.NBT.1

Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Common Misconceptions

Students sometimes recognize counting as a pattern much like singing the alphabet. This pattern can be memorized but may not be understood. Students who have done this can have difficulty counting on from a number other than 1. These students may also have difficulty counting backwards. When counting backwards, ask students to start at 24 and count back to 15. Listen to see if they can make the jump over the decade from 20 to 19.

Academic Vocabulary/Language

- ten
- one
- hundred
- numeral

Tier 2

- count
- write

Essential Understandings

- Rote counting is a repeating pattern.
- The cardinality of a group is the total number of objects in the group.

Learning Targets

- I can count to 120 starting with any number, starting with any number less than 120.
- I can count by ones and tens in a sequence up to 120.
- I can read and write any of the numbers up to 120.
- I can represent a number of objects with a written numeral up to 120.

Classroom Snapshot

Examples

23, 24, 25, . . . 118, 119, 120.

Write any number from 1 to 120 when prompted
(example: write fifty-three = 53).

Given a random group of objects, count and name
the number of the group of objects.

Adapted from Darke County Schools and North Carolina Public Schools Wikispaces

Questions

Begin at 88 and count up to 102.

Write the number 113.

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

In this grade, students build on their counting to 100 by ones and tens beginning with numbers other than 1 as they learned in Kindergarten. Students can start counting at any number less than 120 and continue to 120. It is important for students to connect different representations for the same quantity or number. Students use materials to count by ones and tens to a build models that represent a number, then they connect this model to the number word and its representation as a written numeral.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Understand the patterns of ones, tens, and hundreds (1.NBT.2).

Use pennies and dimes to count (1.MD.3).

K.CC.1 (Prior Grade Standard)

Count to 100 by ones and by tens.

2.NBT.2 (Future Grade Standard)

Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;"> <h3>1.NBT.2</h3> </div>	<p>Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: 10 can be thought of as a bundle of ten ones — called a “ten;” the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones; and the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).</p>	<p style="text-align: center;">Common Misconceptions</p> <p>Students may struggle with the concept of place value and how to break numbers apart. They may not see that a bundle of ten ones is the same a ten or that numbers 10, 20, etc. can be identified as 10 ones or a group of ten, 20 ones or two groups of ten.</p>	<p style="text-align: center;">Academic Vocabulary/Language</p> <ul style="list-style-type: none"> ▪ tens ▪ ones ▪ digit ▪ zero ▪ group ▪ bundle <p style="text-align: center;">Tier 2</p> <ul style="list-style-type: none"> ▪ represent ▪ explain
<p style="text-align: center;">Essential Understandings</p> <ul style="list-style-type: none"> • A group of ten ones is now referred to as a “ten.” • A two-digit number is made up of tens and ones. 			
<p>Learning Targets</p>	<p>I can explain how ten "ones" can be grouped together and given a new name of "ten".</p> <p>I can explain how the teen numbers are formed by one "ten" and a given number of "ones".</p> <p>I can explain how 10, 20, 30, 40, 50, 60, 70, 80, and 90 are made from a given number of "tens" and zero "ones".</p>		

Classroom Snapshot

Examples

Ten ones can be grouped together to make one ten - or 10.

13 is one ten and 3 ones.

The ten numbers (10, 20, 30, . . .) are all made from bundles of tens. They have no additional ones.

Questions

Here is a pile of 12 cubes. Do you have enough to make a ten? Will there be any ones left over?

Are 19 and 91 the same or different? How do you know?

Adapted from Darke County Schools and North Carolina Public Schools Wikispaces

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

The beginning concepts of place value are developed in Grade 1 with the understanding of ones and tens. The major concept is that putting ten ones together makes a ten and that there is a way to write that down so the same number is always understood. Students move from counting by ones, to creating groups and ones, to tens and ones. It is essential at this grade for students to see and use multiple representations of making tens using base-ten blocks, bundles of tens and ones, and ten-frames. Making the connections among the representations, the numerals and the words are very important. Students need to connect these different representations for the numbers 0 to 99.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Count, read, and write numerals to 120 (1.NBT.1).

Add within 100 using place value strategies (1.NBT.4).

Mentally find ten more or ten less than a given number (1.NBT.5).

Subtract multiples of 10 between 10–90 (1.NBT.6).

Use pennies and dimes to further place value understanding of ones and tens (1.MD.3).

K.NBT.1 (Prior Grade Standard)

Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Note: Drawings need not show details, but should show the mathematics in the problem – this applies wherever drawings are mentioned in the Standards.)

2.NBT.1 (Future Grade Standard)

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

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



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.NBT.3

Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

Essential Understandings

- Numbers can be compared.
- Symbols can be used to record the comparison between numbers.
- A numeral can stand for a different amount depending on its place or position in a number.

Common Misconceptions

The use of the learning aids (such as alligator mouth) must be accompanied by the connection to the symbols: $<$ (less than), $>$ (greater than), and $=$ (equal to). More importantly, students need to begin to develop the understanding between comparing numbers and place value. In Grade 1, it means that this number has more tens, or the same number of tens, but with more ones, making it greater. Students need to begin to understand that both inequality symbols ($<$, $>$) can create true statements about any two numbers where one is greater/smaller than the other, ($15 < 28$ and $28 > 15$).

Academic Vocabulary/Language

- greater than
- less than
- equal to
- group of
- digit
- ones
- $<$
- $>$
- $=$

Tier 2

- compare

Learning Targets	I can compare two numbers from 10 to 99 and say how many "tens" and how many "ones" each number has. I can compare two numbers from 10 to 99 and write the correct number sentence to compare them.
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Classroom Snapshot	
Examples	Questions
<p>23 has 2 tens and three ones while 32 has 3 tens and two ones. 23 < 32 because 23 has fewer tens than the number 32.</p> <p>61 = 61, 61 is the same as 61</p>	<p>Compare these two numbers 42 ___ 45.</p> <p>Order these numbers from least to greatest: 49,7,22,98, and 3</p>
Adapted from Darke County Schools	
Ohio Department of Education Model Curriculum Instructional Strategies and Resources	
<p>Students need to move through a progression of representations to learn a concept. They start with a concrete model, move to a pictorial or representational model, then an abstract model. For example, ask students to place a handful of small objects in one region and a handful in another region. Next have them draw a picture of the objects in each region. They can draw a likeness of the objects or use a symbol for the objects in their drawing. Now they count the physical objects or the objects in their drawings in each region and use numerals to represent the two counts. They also say and write the number word. Now students can compare the two numbers using an inequality symbol or an equal sign.</p>	
Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)	
Connections Across Standards	
Count, read, and write numerals to 120 (1.NBT.1).	
Add within 100 using place value strategies (1.NBT.4).	
Mentally find ten more or ten less than a given number (1.NBT.5).	
Subtract multiples of 10 between 10–90 (1.NBT.6).	
Use pennies and dimes to further place value understanding of ones and tens (1.MD.3).	
K.NBT.1 (Prior Grade Standard) Compose and decompose numbers from 11 to 19 into a group of ten ones and some further ones by using objects and, when appropriate, drawings or equations; understand that these numbers are composed of a group of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	2.NBT.4 (Future Grade Standard) Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.NBT.4

Add within 100, including adding a two-digit number and a one-digit number and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies

based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that when adding two-digit numbers, tens are added to tens; ones are added to ones; and sometimes it is necessary to compose a ten.

Essential Understandings

- When adding numbers, the place and value of the digits is important for determining the sum.
- When adding two-digit numbers, tens are added to tens, ones are added to ones.
- When adding, sometimes it is necessary to compose a ten.
- The digit in the ones place will remain the same when finding 10 more or 10 less of another number, e.g., $18 + 10 = 28$.
- There is a relationship between addition and subtraction.
- When subtracting multiples of 10 from multiples of 10, the digit in the tens place changes and the digit in the ones place remains a zero, e.g., $60 - 20 = 40$.
- When subtracting multiples of 10 from any number, the digit in the tens place changes and the digit in the ones place remains the same, e.g., $82 - 30 = 52$.

Common Misconceptions

Students who have not mastered the concept of place value may struggle with how to break numbers apart to add them. They may not see that when adding two-digit numbers, one adds tens and tens, ones and ones. Sometimes when adding, you must make another ten.

Academic Vocabulary/Language

- add
- regroup
- tens
- ones
- one-digit number
- two-digit number

Tier 2

- explain
- compose a ten

Learning Targets	<p>I can add two numbers from 0 to 100 (two-digit + one-digit or two-digit + multiple of 10) using models, drawings, or equations and explain how I did it.</p> <p>I can add two numbers from 0 to 100 (two-digit + one-digit or two-digit + multiple of 10) and can explain how it is sometimes necessary to take ten "ones" and regroup/rename as "ten".</p>
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Classroom Snapshot	
Examples	Questions
<p>23 + 40 = 63 because I added the twenty and forty together to get sixty and then added the three ones to get 63.</p> <p>When I add 36 + 5 I initially have 3 tens. But when I add the 5 ones and 6 ones it becomes a 10 and 1 one. So 30 plus 10 is 40 plus 1 more one is 41.</p> <p>Adapted from Darke County Schools and North Carolina Public Schools Wikispaces</p>	<p>24 red apples and 8 green apples are on the table. How many apples are on the table?</p> <p>63 apples are in the basket. Jackson put 20 more apples in the basket. How many apples are in the basket?</p>
<p style="text-align: center;">Ohio Department of Education Model Curriculum Instructional Strategies and Resources</p> <p>Students should solve problems using concrete models and drawings to support and record their solutions. It is important for them to share the reasoning that supports their solution strategies with their classmates.</p> <p>Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)</p>	
<p>Connections Across Standards</p> <p>Use addition and subtraction within 20 to solve word problems with support (1.OA.1).</p> <p>Relate counting to addition and subtraction (1.OA.5).</p> <p>Fluently add and subtract within 10, and use strategies for adding and subtracting within 20 (1.OA.6).</p> <p>Understand place value of tens and ones (1.NBT.2).</p> <p>Use pennies and dimes to add and subtract (1.MD.3).</p>	
<p>K.NBT.1 (Prior Grade Standard)</p> <p>Compose and decompose numbers from 11 to 19 into a group of ten ones and some further ones by using objects and, when appropriate, drawings or equations; understand that these numbers are composed of a group of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.</p>	<p>2.NBT.7 (Future Grade Standard)</p> <p>Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or</p>

	subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.
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Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

<div style="border: 1px solid black; border-radius: 15px; padding: 10px; display: inline-block;"> <h3>1.NBT.5</h3> </div>	<p>Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</p>	<p>Common Misconceptions Students have difficulty with ten as a singular word that means 10 things. For many students, the understanding that a group of 10 things can be replaced by a single object and they both represent 10 is confusing.</p>	<p>Academic Vocabulary/Language</p> <ul style="list-style-type: none"> • ten • more • less • place value <p style="text-align: center;">Tier 2</p> <ul style="list-style-type: none"> • explain
<p style="text-align: center;">Essential Understandings</p> <ul style="list-style-type: none"> • The digit in the ones place will remain the same when finding 10 more or 10 less of another number, e.g., $18 + 10 = 28$. • There is a relationship between addition and subtraction. 			
<p>Learning Target</p>	<p>I can add or subtract 10 from any number from 10 to 99 in my head and explain how I did it using the properties of place value.</p>		

Classroom Snapshot

Examples

78 - 10 will be 68 because I take one bundle of ten from 78 (7 - 1) and that gives me 68.

26 + 10 will be 36 because I add one bundle of ten to 26 (2 + 1) and that gives me 36.

Questions

There are 74 birds in the park. 10 birds fly away. How many birds are in the park now?

Pam said 86 is 10 more than 96. Is she correct? How do you know?

Adapted from Darke County Schools, North Carolina Public Schools Wikispaces and Howard County Schools

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Students will usually move to using base-ten concepts, properties of operations, and the relationship between addition and subtraction to invent mental and written strategies for addition and subtraction. Help students share, explore, and record their invented strategies. Recording the expressions and equations in the strategies horizontally encourages students to think about the numbers and the quantities they represent. Encourage students to try the mental and written strategies created by their classmates. Students eventually need to choose efficient strategies to use to find accurate solutions.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Use addition and subtraction within 20 to solve word problems with support (1.OA.1).

Relate counting to addition and subtraction (1.OA.5).

Fluently add and subtract within 10, and use strategies for adding and subtracting within 20 (1.OA.6).

Understand place value of tens and ones (1.NBT.2).

Use pennies and dimes to add and subtract (1.MD.3).

K.CC.1 (Prior Grade Standard)

Count to 100 by ones and by tens.

2.NBT.8 (Future Grade Standard)

Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.



Ohio's Learning Standards-Clear Learning Targets

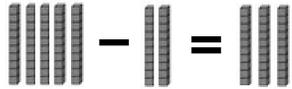
Math Grade 1

<p>1.NBT.6</p>	<p>Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</p>	<p>Common Misconceptions Students have difficulty with ten as a singular word that means 10 things. For many students, the understanding that a group of 10 things can be replaced by a single object and they both represent 10 is confusing.</p>	<p>Academic Vocabulary/Language</p> <ul style="list-style-type: none"> ▪ subtract ▪ less ▪ place value <p>Tier 2</p> <ul style="list-style-type: none"> ▪ explain ▪ relate ▪ model
<p>Essential Understandings</p> <ul style="list-style-type: none"> • There is a relationship between addition and subtraction. • When subtracting multiples of 10 from multiples of 10, the digit in the tens place changes and the digit in the ones place remains a zero, e.g., $60 - 20 = 40$. • When subtracting multiples of 10 from any number, the digit in the tens place changes and the digit in the ones place remains the same, e.g., $82 - 30 = 52$. 			
<p>Learning Target</p>	<p>I can subtract multiples of 10 from multiples of 10 (in the range of numbers 10-90), and explain the answer using a model, drawing, and other strategies.</p>		

Classroom Snapshot

Examples

$50 - 20 = 30$ because . . .

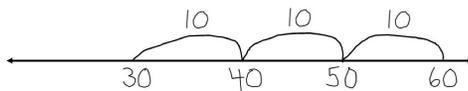


There are 60 students in the gym. 30 students leave. How many students are still in the gym?

$$60 - 10 = 50$$

$$50 - 10 = 40$$

$$40 - 10 = 30$$



Adapted from Darke County Schools, North Carolina Public Schools Wikispaces and Howard County Schools

Questions

Jamie said $70 - 30 = 40$. Is she correct? Explain your thinking using a model or drawing.

Show two ways to solve $90 - 40$.

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Have students connect a 0-99 chart or a 1-100 chart to their invented strategy for finding 10 more and 10 less than a given number. Ask them to record their strategy and explain their reasoning.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Use addition and subtraction within 20 to solve word problems with support (1.OA.1).

Relate counting to addition and subtraction (1.OA.5).

Fluently add and subtract within 10, and use strategies for adding and subtracting within 20 (1.OA.6).

Understand place value of tens and ones (1.NBT.2).

Use pennies and dimes to add and subtract (1.MD.3).

K.OA.1 (Prior Grade Standard)

Represent addition and subtraction with objects, fingers, mental images, drawings, sounds such as claps, acting out situations, verbal explanations, expressions, or equations. Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)

2.NBT.7 (Future Grade Standard)

Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.MD.1

Order three objects by length; compare the lengths of two objects indirectly by using a third object.

Common Misconceptions

Some students may view the measurement process as a procedural counting task. They might count the markings on a ruler rather than the spaces between (the unit of measure). Students need numerous experiences measuring lengths with student-made tapes or rulers with numbers in the center of the spaces.

Academic Vocabulary/Language

- length
- short
- long
- compare
- shorter/shortest
- longer/longest

Tier 2

- measure
- order

Essential Understandings

- Length is a measurable attribute of an object.
- The length remains constant, even if its orientation or position is changed.
- Objects must be placed at the same endpoint for comparison.
- Lengths of two objects can be compared indirectly by using a third object.

Learning Target

I can put three objects in order from longest to shortest using one of the objects to compare lengths of the other two.

Classroom Snapshot

Examples

Using Unifix cubes I can arrange three different stacks in order from shortest to longest.

For example, the blue crayon is longer than the red crayon, and the red crayon is longer than the yellow crayon. Based on the relationships the student also can conclude that the blue crayon is longer than the yellow crayon.

Questions

The pet store owner is trying to put the hamsters in order from shortest to longest. The black hamster is longer than the gray hamster and the brown hamster is shorter than the gray hamster.

Select three school supplies. Put them in order from longest to shortest.

Adapted from Darke County Schools, North Carolina Public Schools Wikispaces and Howard County Schools

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

The measure of an attribute is a count of how many units are needed to fill, cover or match the attribute of the object being measured. Students need to understand what a unit of measure is and how it is used to find a measurement. They need to predict the measurement, find the measurement and then discuss the estimates, errors and the measuring process. It is important for students to measure the same attribute of an object with differently sized units.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Count within 120 (1.NBT.1).

Compare two-digit numbers (1.NBT.3).

K.MD.2 (Prior Grade Standard)

Directly compare two objects with a measurable attribute in common to see which object has "more of" or "less of" the attribute, and describe the difference. *For example, directly compare the heights of two children, and describe one child as taller/shorter.*

2.MD.4 (Future Grade Standard)

Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.MD.2

Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.

Essential Understandings

- Objects must be placed at the same endpoint for comparison.
- Copies of a shorter object can be used to measure the length of a longer object.
- When measuring an object with nonstandard units, the same-size length unit is used.
- When measuring an object with nonstandard units, no gaps or overlaps occur.

Common Misconceptions

Some students may view the measurement process as a procedural counting task. They might count the markings on a ruler rather than the spaces between (the unit of measure). Students need numerous experiences measuring lengths with student-made tapes or rulers with numbers in the center of the spaces.

Academic

Vocabulary/Language

- length
- measure
- unit
- whole number

Tier 2

- gap
- overlap

Learning Target

I can measure the length of an object by laying down many copies of a smaller object, multiple times, to describe the length of an object.

Classroom Snapshot

Examples

I can measure the length of my paper by using a single Unifix cube and finding how many laid end to end would be the same length as my paper.

Measure this pencil using non-standard units



Questions

Measure your desk using a paperclip. How long is your desk?

How long is your shoe? Measure it using linking cubes.

Adapted from Darke County Schools, North Carolina Public Schools Wikispaces and Howard County Schools

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Measurement units share the attribute being measured. Students need to use as many copies of the length unit as necessary to match the length being measured. For instance, use large footprints with the same size as length units. Place the footprints end to end, without gaps or overlaps, to measure the length of a room to the nearest whole footprint. Use language that reflects the approximate nature of measurement, such as the length of the room is about 19 footprints. Students need to also measure the lengths of curves and other distances that are not straight lines.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Count within 120 (1.NBT.1).

Compare two-digit numbers (1.NBT.3).

K.MD.2 (Prior Grade Standard)

Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*

2.MD.1 (Future Grade Standard)

Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

<div style="border: 1px solid black; border-radius: 15px; padding: 10px; display: inline-block;"> <h3 style="margin: 0;">1.MD.3</h3> </div>	<p>Work with time and money.</p> <p>a. Tell and write time in hours and half-hours using analog and digital clocks.</p> <p>b. Identify pennies and dimes by name and value.</p>	<p style="text-align: center;">Common Misconceptions</p> <p>Students have a difficult time telling the differences between the two hands and how they work. When the hour hand is not directly pointing to a number the students struggle to identify the time. When working with money, students may think that the larger the coin, the greater the value.</p>	<p style="text-align: center;">Academic Vocabulary/Language</p> <ul style="list-style-type: none"> ▪ hour ▪ hour hand ▪ minute ▪ minute hand ▪ analog clock ▪ digital clock ▪ o'clock ▪ half hour ▪ penny ▪ dime ▪ coin ▪ value ▪ cent <p style="text-align: center;">Tier 2</p> <ul style="list-style-type: none"> ▪ tell ▪ write
<p style="text-align: center;">Essential Understandings</p> <ul style="list-style-type: none"> ● Time is a measurable attribute. ● Time is measured in hours and minutes. ● Time can be measured using an analog clock with an hour hand (short) and minute hand (long). ● Time can be measured using a digital clock, e.g., 11 o'clock is represented as 11:00. ● A penny is worth 1 cent (1¢). ● A dime is worth 10 cents (10¢). ● The size of a coin does not determine its value. 			
<p>Learning Target</p>	<p>I can tell time to the nearest hour or half hour on an analog or digital clock. I can name and identify the value of pennies and dimes.</p>		

Classroom Snapshot

Examples

The time is 3:30.



Show me the coin that has the same value as 10 pennies? (dime)

Questions

Write the times shown on each of the clocks below:



Which coin is the same as one cent?

Adapted from Darke County Schools and North Carolina Public Schools Wikispaces

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Students need to experience a progression of activities for learning how to tell time. Begin by using a one-handed clock to tell times in hour and half-hour intervals, then discuss what is happening to the unseen big hand. Next use two real clocks, one with the minute hand removed, and compare the hands on the clocks. Students can predict the position of the missing big hand to the nearest hour or half-hour and check their prediction using the two-handed clock. They can also predict the display on a digital clock given a time on a one- or two-handed analog clock and vice-versa.

Use play money - pennies and dimes, to count by 1s, and skip count by 10s. Reinforce place value concepts with the values of pennies and dimes.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Read and write numerals within 120 (1.NBT.1).

Understand place value (1.NBT.2-3).

Partition circle into halves (1.G.3).

K.CC.4 (Prior Grade Standard)

Understand the relationship between numbers and quantities; connect counting to cardinality using a variety of objects including pennies.

- a. When counting objects, establish a one-to-one relationship by saying the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

2.MD.7 (Future Grade Standard)

Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

2.MD.8 (Future Grade Standard)

Solve problems with money.

- a. Identify nickels and quarters by name and value.
- b. Find the value of a collection of quarters, dimes, nickels, and pennies.
- c. Solve word problems by adding and subtracting within 100, dollars with dollars and cents with cents (not using dollars and cents simultaneously) using the \$ and ¢ symbols appropriately (not including decimal notation).



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

<div style="border: 1px solid black; border-radius: 15px; padding: 10px; display: inline-block;"> <h3 style="margin: 0;">1.MD.4</h3> </div>	<p>Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</p>	<p style="text-align: center;">Common Misconceptions</p> <p>The attributes for the same kind of object can vary. This will cause equal values in an object graph to appear unequal. For example, when making bars for an object graph using shoes for boys and girls, five adjacent boy shoes would likely appear longer than five adjacent girl shoes. To standardize the objects, place the objects on the same-sized construction paper, then make the object graph.</p>	<p style="text-align: center;">Academic Vocabulary/Language</p> <ul style="list-style-type: none"> ▪ tally chart ▪ survey ▪ data ▪ graph ▪ picture ▪ picture graph ▪ bar graph ▪ models ▪ drawings ▪ graphic organizers <p style="text-align: center;">Tier 2</p> <ul style="list-style-type: none"> ▪ organize ▪ represent ▪ answer
<p style="text-align: center;">Essential Understandings</p> <ul style="list-style-type: none"> ● Categorical data results from sorting objects into two or three categories. ● Data can be organized in more than one way. ● Data can be represented (recorded with models, drawings, or graphic organizers) in more than one way. ● Data can be interpreted in more than one way. <ul style="list-style-type: none"> ○ Addition, subtraction, and comparison are used to answer questions. 			
<p>Learning Targets</p>	<p>I can organize objects into a graph. I can collect and record data using a model, drawing, or graphic organizer. I can answer questions about the data such as how many in each group, which group has more, which group has less, and what is the total amount of data.</p>		

Classroom Snapshot

Examples

Ask and answer questions about the total number of items in a category.

Count the data points in each category and determine which categories have more or less.

Collect and organize data.

Questions

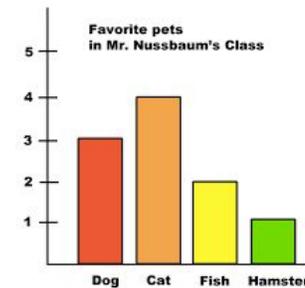
What is your favorite flavor of ice cream?

Name: Barbara

What is your favorite flavor of ice cream?	
Chocolate	Amy Ethan Dylan Emma Ryan Elijah Ava Brittany THOMAS Nathan 12
Vanilla	Sarah Maria Brian Katie KITTY 5
Strawberry	Rodney Brandon Darrell Mia Tonya Jose 6

12 people liked chocolate. Chocolate has the most votes. Vanilla has 5 votes. 1 more vote and it can tie with strawberry.

How many more students like cats than fish?



Adapted from Darke County Schools, North Carolina Public Schools Wikispaces and Howard County Schools

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Ask students to sort a collection of items in up to three categories. Then ask questions about the number of items in each category and the total number of items. Also ask students to compare the number of items in each category. The total number of items to be sorted should be less than or equal to 100 to allow for sums and differences less than or equal to 100 using the numbers 0 to 100.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

Using addition and subtraction within 20 to solve word problems involving all situations types. See Table 1, page 95. (1.OA.1)

Solve word problems that call for addition of the whole numbers whose sum is less than or equal to 20 (1.OA.2)

Determine the unknown whole numbers in an addition or subtraction equation relating three whole numbers (1.OA.8)

Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparison with the symbols $>$, $=$, and $<$ (1.NBT.3).

K.MD.3 (Prior Grade Standard)

Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. The number of objects in each category should be less than or equal to ten. Counting and sorting coins should be limited to pennies.

2.MD.10 (Future Grade Standard)

Organize, represent, and interpret data with up to four categories; complete picture graphs when single-unit scales are provided; complete bar graphs when single-unit scales are provided; solve simple put-together, take-apart, and compare problems in a graph. See Table 1, page 95.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.G.1

Distinguish between defining attributes, e.g., triangles are closed and three-sided, versus non-defining attributes, e.g., color, orientation, overall size; build and draw shapes that possess defining attributes.

Common Misconceptions
 Students may think that a square that has been rotated is no longer the original shape. They need to have experiences with shapes in different orientations. For example, in the building-shapes strategy above, ask students to orient the smaller shapes in different ways.

Academic Vocabulary/Language

- attribute
- sides
- vertex
- two-dimensional shapes
- square
- triangle
- trapezoid
- rectangle
- circle

- Essential Understandings**
- Rectangles, squares, trapezoids, and triangles are two-dimensional closed shapes having straight sides that meet at corners.
 - Shapes have defining and non-defining attributes.
 - Shapes can be represented through models and drawings using defining attributes.
 - Color, size, and orientation are non-defining attributes.

Tier 2

- describe

Learning Targets

I can describe the attributes that make circles, triangles, squares, trapezoids, and rectangles special.

Classroom Snapshot

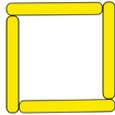
Examples

What's important about a triangle is that it has three sides - not the color.

Build a shape from these popsicle sticks. What shape did you make? How do you know?

I used popsicle sticks to build a square.

I know it's a square because it has 4 sides and all 4 sides are the same size.



Questions

Build a shape that has four sides and all the sides are of equal length.

Trace two different attribute blocks. Describe how they are alike and how they are different.

Adapted from Darke County Schools, North Carolina Public Schools Wikispaces and Howard County Schools

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Students can easily form shapes on geoboards using colored rubber bands to represent the sides of a shape. Ask students to create a shape with four sides on their geoboard and then copy the shape on dot paper. Students can share and describe their shapes as a class while the teacher records the different defining attributes mentioned by the students.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

A half circle is related to half hour (1.MD.3).

K.G.2 (Prior Grade Standard)

Correctly name shapes regardless of their orientations or overall size.

2.G.1 (Future Grade Standard)

Recognize and identify triangles, quadrilaterals, pentagons, and hexagons based on the number of sides or vertices. Recognize and identify cubes, rectangular prisms, cones, and cylinders.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.G.2

Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. Students do not need to learn formal names such as "right rectangular prism."

Essential Understandings

- Shapes can be combined to form larger shapes:
 - two-dimensional shapes with two-dimensional shapes
 - three-dimensional shapes with three-dimensional shapes

Common Misconceptions

Students may struggle to see a new shape from a composite shape. For example, a triangle and a square create a composite shape - pentagon. Students may see only the triangle and square not the pentagon. Students struggle to identify attributes of a shape that determines the shape name.

Although students do not need to know the formal names for the 3-D shapes, they should understand that a new composite shape may have a new name.

Academic Vocabulary/Language

- composite
- two-dimensional
- square
- triangle
- trapezoid
- rectangle
- half-circle
- quarter-circle
- three-dimensional

Tier 2

- put together

Learning Targets

I can put two-dimensional shapes together to make rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles to make composite shape.
 I can put three-dimensional shapes together to make cubes, right rectangular prisms, right circular cones, and right circular cylinders to make a composite shape.

Classroom Snapshot

Examples

Put three triangles together to form a new shape and name the attributes of the new shape.

Put two 3D shapes (cubes, cones, prisms, etc.) together to make new shapes and describe them.

Questions

How many different shapes can you make using 5 green pattern block triangles?

What shape can you make with cube and a rectangular prism?

Adapted from Darke County Schools, North Carolina Public Schools Wikispaces and Howard County Schools

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Students can use a variety of manipulatives and real-world objects to build larger shapes. The manipulatives can include paper shapes, pattern blocks, color tiles, triangles cut from squares (isosceles right triangles), tangrams, canned food (right circular cylinders) and gift boxes (cubes or right rectangular prisms).

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

A half circle is related to half hour (1.MD.3).

K.G.6 (Prior Grade Standard)

Combine simple shapes to form larger shapes.

2.G.1 (Future Grade Standard)

Recognize and identify triangles, quadrilaterals, pentagons, and hexagons based on the number of sides or vertices. Recognize and identify cubes, rectangular prisms, cones, and cylinders.



Ohio's Learning Standards-Clear Learning Targets

Math Grade 1

1.G.3

Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the

phrases half of, fourth of, and quarter of. Describe the whole as two of or four of the shares in real-world contexts. Understand for these examples that decomposing into more equal shares creates smaller shares.

Common Misconceptions

Some students may think that the size of the equal shares is directly related to the number of equal shares. For example, they think that fourths are larger than halves because there are four fourths in one whole and only two halves in one whole. Students need to focus on the change in the size of the fractional parts as recommended in the folding shapes strategy. Allow students to divide a circle into the number of equal parts that they choose. Students can easily see the change in the size of the equal shares as they increase or decrease the number of parts.

Academic Vocabulary/Language

- whole
- equal part (s)
- halves
- fourth
- quarter
- half of
- fourth of
- quarter of
- share

Tier 2

- divide
- describe

Essential Understandings

- When dividing a shape into equal shares, the pieces all need to represent the same amount.
- As the number of equal shares in a shape increases, the size of each equal share decreases, e.g., Halves are larger than fourths.
- As the number of equal shares in a shape decreases, the size of each equal share increases, e.g., Quarters are less than halves.

Learning Targets

I can divide circles and rectangles into two and four equal parts and name the parts in many ways.
I can explain how dividing a circle or rectangle into more equal parts means there will be smaller parts.

Classroom Snapshot

Examples

Divide the circle into four equal parts and name each part.



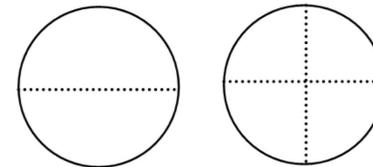
If two students divide the same size circle into equal parts and one has 2 parts and the other has 4 parts, how does the size of the parts compare?

Questions

How can you and a friend share equally (partition) this piece of paper so that you both have the same amount of paper to paint a picture?



You can have only one slice of pizza. Which pizza should you pick your slice from if you want the largest piece? Explain how you know which one to pick.



Adapted from Darke County Schools and North Carolina Public Schools Wikispace

Ohio Department of Education Model Curriculum Instructional Strategies and Resources

Folding shapes made from paper enables students to physically feel the shape and form the equal shares. Ask students to fold circles and rectangles first into halves and then into fourths. They should observe and then discuss the change in the size of the parts.

Ohio's New Learning Standards Mathematics Grade 1 Model Curriculum 2015 (Adjusted to reflect standards revisions.)

Connections Across Standards

A half circle is related to half hour (1.MD.3).

K.G.4 (Prior Grade Standard)

Describe and compare two- or three-dimensional shapes, in different sizes and orientations, using informal language to describe their commonalities, differences, parts, and other attributes.

2.G.3 (Future Grade Standard)

Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, or fourths and quarters, and use the phrases half of, third of, or fourth of and quarter of. Describe the whole as two halves, three thirds, or four fourths in real-world contexts. Recognize that equal shares of identical wholes need not have the same shape.