NEBRASKA

Alternate Mathematics Instructional Supports for NSCAS Mathematics Extended Indicators Grade 4

for
Students with the Most Significant Cognitive Disabilities
who take the
Statewide Mathematics Alternate Assessment

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Overview

Introduction

Mathematics standards apply to all students, regardless of age, gender, cultural or ethnic background, disabilities, aspirations, or interest and motivation in mathematics (NRC, 1996).

The mathematics standards, extended indicators, and instructional supports in this document were developed by Nebraska educators to facilitate and support mathematics instruction for students with the most significant intellectual disabilities. They are directly aligned to the Nebraska's College and Career Ready Standards for Mathematics adopted by the Nebraska State Board of Education.

The instructional supports included here are sample tasks that are available to be used by educators in classrooms to help instruct students with significant intellectual disabilities.

The Role of Extended Indicators

For students with the most significant intellectual disabilities, achieving grade-level standards is not the same as meeting grade-level expectations, because the instructional program for these students addresses extended indicators.

It is important for teachers of students with the most significant intellectual disabilities to recognize that extended indicators are not meant to be viewed as sufficient skills or understandings. Extended indicators must be viewed only as access or entry points to the grade-level standards. The extended indicators in this document are not intended as the end goal but as a starting place for moving students forward to conventional reading and writing. Lists following "e.g." in the extended indicators are provided only as possible examples.

Students with the Most Significant Intellectual Disabilities

In the United States, approximately 1% of school-aged children have an intellectual disability that is "characterized by significant impairments both in intellectual and adaptive functioning as expressed in conceptual, social, and practical adaptive domains" (U.S. Department of Education, 2002 and American Association of Intellectual and Developmental Disabilities, 2013). These students show evidence of cognitive functioning in the range of severe to profound and need extensive or pervasive support. Students need intensive instruction and/or supports to acquire, maintain, and generalize academic and life skills in order to actively participate in school, work, home, or community. In addition to significant intellectual disabilities, students may have accompanying communication, motor, sensory, or other impairments.

Alternate Assessment Determination Guidelines

The student taking a Statewide Alternate Assessment is characterized by significant impairments both in intellectual and adaptive functioning which is expressed in conceptual, social, and practical adaptive domains and that originates before age 18 (American Association of Intellectual and Developmental Disabilities, 2013). It is important to recognize the huge disparity of skills possessed by students taking an alternate assessment and to consider the uniqueness of each child.

Thus, the IEP team must consider all of the following guidelines when determining the appropriateness of a curriculum based on Extended Indicators and the use of the Statewide Alternate Assessment.

- The student requires extensive, pervasive, and frequent supports in order to acquire, maintain, and demonstrate performance of knowledge and skills.
- The student's cognitive functioning is significantly below age expectations and has an impact on the student's ability to function in multiple environments (school, home, and community).
- The student's demonstrated cognitive ability and adaptive functioning prevent completion of the general academic curriculum, even with appropriately designed and implemented modifications and accommodations.
- The student's curriculum and instruction is aligned to the Nebraska College and Career Ready Mathematics Standards with Extended Indicators.
- The student may have accompanying communication, motor, sensory, or other impairments.

The Nebraska Department of Education's technical assistance documents "***IEP Team Decision Making Guidelines—Statewide Assessment for Students with Disabilities***" and "***Alternate Assessment Criteria/Checklist***" provide additional information on selecting appropriate statewide assessments for students with disabilities. School Age Statewide Assessment Tests for Students with Disabilities—Nebraska Department of Education.

Instructional Supports Overview

The mathematics instructional supports are scaffolded activities available for use by educators who are instructing students with significant intellectual disabilities. The instructional supports are aligned to the extended indicators in grades three through eight and in high school. Each instructional support includes the following components:

- Scaffolded activities for the extended indicator
- Prerequisite extended indicators
- Key terms
- Additional resources or links

The scaffolded activities provide guidance and suggestions designed to support instruction with curricular materials that are already in use. They are not complete lesson plans. The examples and activities presented are ready to be used with students. However, teachers will need to supplement these activities with additional approved curricular materials. The scaffolded activities adhere to research that supports instructional strategies for mathematics intervention, including explicit instruction, guided practice, student explanations or demonstrations, visual and concrete models, and repeated, meaningful practice.

Each scaffolded activity begins with a learning goal, followed by instructional suggestions that are indicated with the inner level, circle bullets. The learning goals progress from less complex to more complex. The first learning goal is aligned with the extended indicator but is at a lower achievement level than the extended indicator. The subsequent learning goals progress in complexity to the last learning goal, which is at the achievement level of the extended indicator.

The inner level, bulleted statements provide instructional suggestions in a gradual release model. The first one or two bullets provide suggestions for explicit, direct instruction from the teacher. From the teacher's perspective, these first suggestions are examples of "I do." The subsequent bullets are suggestions for how to engage students in guided practice, explanations, or demonstrations with visual or concrete models, and repeated, meaningful practice. These suggestions start with "Ask students to . . ." and are examples of moving from "I do" activities to "we do" and "you do" activities. Visual and concrete models are incorporated whenever possible throughout all activities to demonstrate concepts and provide models that students can use to support their own explanations or demonstrations.

The prerequisite extended indicators are provided to highlight conceptual threads throughout the extended indicators and show how prior learning is connected to new learning. In many cases, prerequisites span multiple grade levels and are a useful resource if further scaffolding is needed.

Key terms may be selected and used by educators to guide vocabulary instruction based on what is appropriate for each individual student. The list of key terms is a suggestion and is not intended to be an all-inclusive list.

Additional links from web-based resources are provided to further support student learning. The resources were selected from organizations that are research based and do not require fees or registrations. The resources are aligned to the extended indicators, but they are written at achievement levels designed for general education students. The activities presented will need to be adapted for use with students with significant intellectual disabilities.

Mathematics—Grade 4
MA 4.1 Number

MA 4.1.1 Numeric Relationships

MA 4.1.1.a

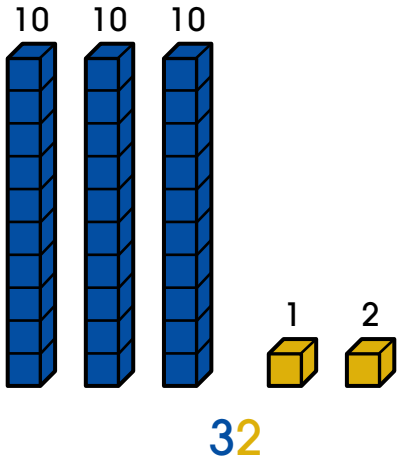
Read, write, and demonstrate multiple equivalent representations for whole numbers up to one million and decimals to the hundredths, using objects, visual representations, standard form, word form, and expanded notation.

Extended: Identify representations of numbers 0–100.

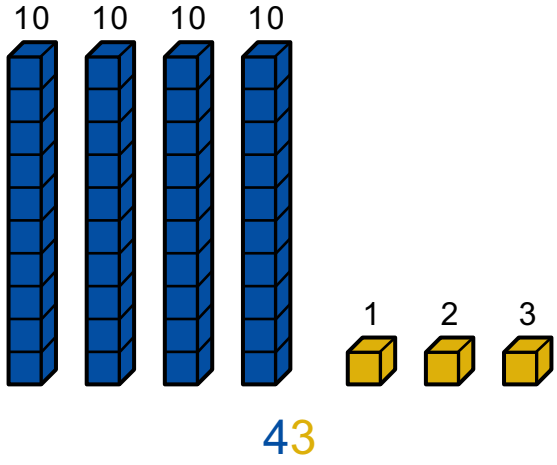
Scaffolding Activities for the Extended Indicator

❑ **Represent the standard form of numerals 0–100 with base-ten blocks.**

- Use base-ten blocks to demonstrate that each base-ten rod represents a group of 10 and that each block represents one. Demonstrate that the blue 3 in the number 32 represents 3 groups of 10, or 30, and that the yellow 2 represents a group of 2.



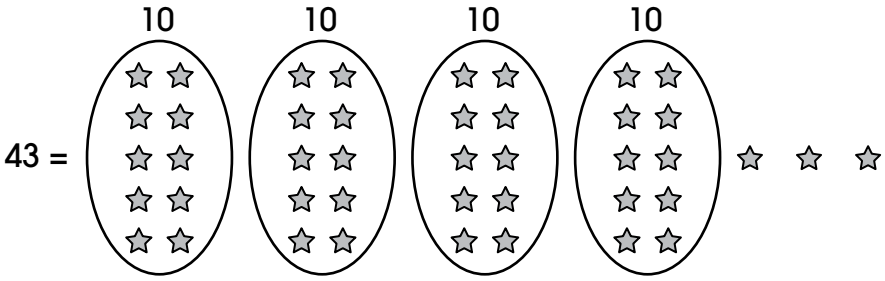
- Ask students to identify the number represented by a visual model. For example, ask students, “What number is represented by this visual model?” Use place-value templates or multiple-choice options for support as needed.



- Present a number from 0 to 100 in standard form. Ask students to represent the number using base-ten blocks and a place-value mat.

❑ **Identify the numeral equivalent to a quantity of objects from 0 to 100 decomposed into groups of 10.**

- Use objects to demonstrate grouping for counting. For example, show students the following model and explain that there are 10 stars inside each circle and that every circle with stars represents the number 10. Demonstrate that the number 43 is being represented in this visual and that rather than counting each individual star, the groups may be counted together. Skip count the four groups, 10, 20, 30, 40, then count on to 41, 42, 43.



- Ask students to determine the whole number represented by a quantity of objects decomposed using groups of 10.
- Present a number from 0 to 100 in standard form. Ask students to represent the number by decomposing the group of objects into groups of 10 or by identifying a visual representation of the objects decomposed into groups of 10.

Prerequisite Extended Indicators

MAE 3.1.1.b—Compare and order whole numbers, 1–20.

MAE 3.1.1.a—Read, write, and demonstrate whole numbers up to 20 that are equivalent representations including visual models, standard form, and word form.

Key Terms

base-ten block, group, skip count

Additional Resources or Links

https://www.engageny.org/resource/grade-1-mathematics-module-6-topic-b-lesson-3

https://www.engageny.org/resource/grade-1-mathematics-module-6-topic-b-lesson-4

MA 4.1.1.c

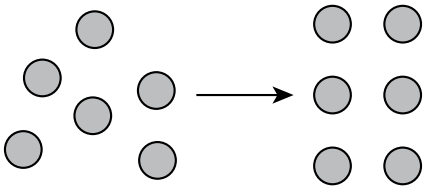
Classify a number up to 100 as prime or composite.

Extended: Identify odd and even numbers up to 20.

Scaffolding Activities for the Extended Indicator

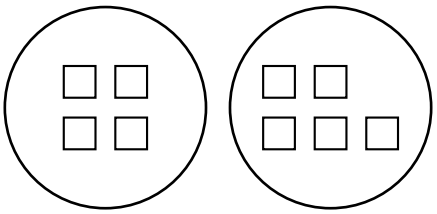
❑ **Identify odd and even numbers up to 20.**

- Use manipulatives to model decomposing objects into pairs. For example, count out a set of 6 tokens. Then demonstrate sorting those tokens into groups of 2, or pairs. Explain that since all 6 tokens are grouped in sets of 2, or pairs, the number 6 is even.



  Repeat the process with 7 tokens. Explain that since there is 1 token remaining after all the pairs are made, the number is odd. Continue with other numbers, always making as many pairs as possible to determine whether the number is odd or even.

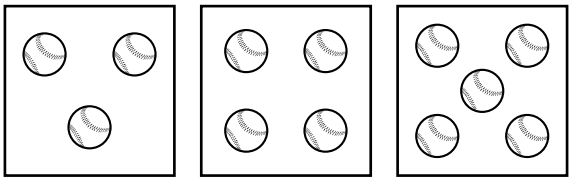
- Use manipulatives sorted into two groups to demonstrate whether a number is even or odd. For example, sort 9 objects into two groups. Explain that since the number of objects is not the same in each group and it is not possible to make the groups equal (and keep the objects whole), 9 is an odd number. Explain and demonstrate that an even number of objects could be sorted into two equal-sized groups.



- Ask students to sort groups of objects into pairs and into two groups. Create a table to organize students' results about whether the numbers 1–20 are odd or even. Describe even and odd number patterns, including that every other number is odd (or even) and that even numbers are used when counting by 2's. Also discuss the pattern of the last digit of a number indicating whether it is even or odd.

odd	even
1	2
3	4
5	6
7	8
9	10

- Model how to identify odd and even numbers when given a picture representation of the number of objects. For example, present the following groups of baseballs. Model identifying the pairs and determining whether the number is odd or even. If necessary, circle the pairs to help clarify when there is an extra baseball that could not be grouped into a pair. Progress to identifying odd and even numbers without picture representations when appropriate.



- Ask students to identify odd and even numbers with and without picture representations.

Prerequisite Extended Indicators

MAE 3.1.1.b—Compare and order whole numbers, 1–20.

MAE 3.1.1.a—Read, write, and demonstrate whole numbers up to 20 that are equivalent representations including visual models, standard form, and word form.

Key Terms

equal, even, odd, pair, pattern

Additional Resources or Links

https://tasks.illustrativemathematics.org/content-standards/2/OA/C/3/tasks/1418

https://tasks.illustrativemathematics.org/content-standards/2/OA/C/3/tasks/620

MA 4.1.1.d

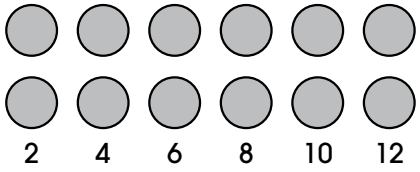
Determine whether a given whole number up to 100 is a multiple of a given one-digit number.

Extended: Count by twos and fives, and tens with numbers, models, or objects up to 40.

Scaffolding Activities for the Extended Indicator

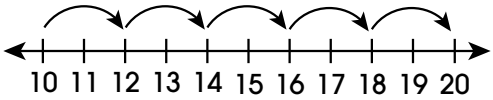
❑ **Count by twos.**

- Use objects to demonstrate counting by twos. This can also be called skip counting and is a faster way to count. For example, pair up objects to help skip count by two.

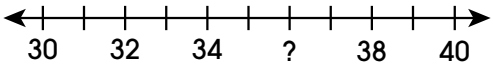


  Indicate that counting by twos uses the even numbers: 2, 4, 6, 8, and so on.

- Use a number line to demonstrate counting by twos. For example, draw arrows on a number line from 10 to 20 that show skip counting by two. Indicate that the pattern that results in landing on every other number (or skipping one number in between) is 10, 12, 14, 16, 18, 20.



  Show skip counting by two on a variety of number lines. When the pattern becomes more familiar, leave a number out of the pattern and demonstrate how to find the missing number.

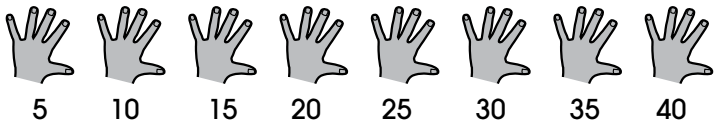


  Counting by twos may also be modeled using a hundreds chart up to 40. Note that skip-counting by twos results in all even numbers being shaded.

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

- Ask students to count by twos with numbers, models, or objects up to 40.

- ❑ **Count by fives.**
  - Use objects to show counting by fives. For example, the five fingers on a hand can be used as shown.

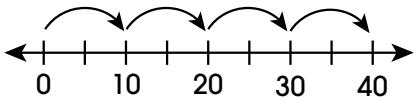


This can also be modeled using a number line or a hundreds chart up to 40. Be sure to explain the pattern of the last digit always being 0 or 5 when skip counting by five.

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

  - Ask students to count by fives with numbers, models, or objects up to 40.

- ❑ **Count by tens.**
  - Use models to demonstrate counting by tens. Skip counting by ten is the fastest way to count to 40, since the “jumps” made are the largest. Indicate that only four numbers are needed when counting to 40 by tens.



Show the same pattern on a hundreds chart.

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

Connect counting by ones (1, 2, 3, 4) to counting by tens (10, 20, 30, 40) by pointing out that a zero is just added to the end of the number. This is the same pattern as multiplying a single digit by ten.

  - Ask students to count by tens with numbers, models, or objects up to 40.

Prerequisite Extended Indicators

MAE 4.1.1.c—Identify odd and even numbers up to 20.

MAE. 4.1.1.a—Identify representations of numbers 0–100.

MAE 3.1.1.b—Compare and order whole numbers, 1–20.

MAE 3.1.1.a—Read, write, and demonstrate whole numbers up to 20 that are equivalent representations including visual models, standard form, and word form.

Key Terms

skip count

Additional Resources or Links

https://www.mathlearningcenter.org/apps/number-line

http://tasks.illustrativemathematics.org/content-standards/2/NBT/A/2/tasks/1309

MA 4.1.1.e

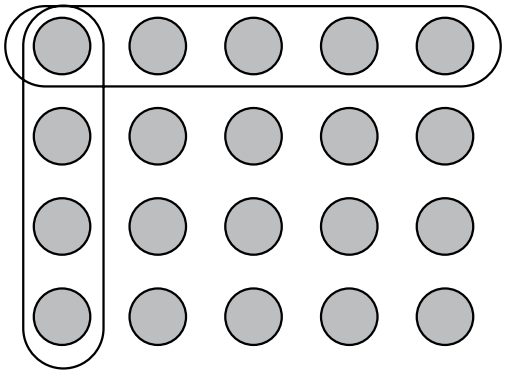
Determine factors of any whole number up to 100.

Extended: Identify the factors of 4, 6, 10, 15, and 20.

Scaffolding Activities for the Extended Indicator

❑ **Identify the factors of 4, 6, 10, 15, and 20 when given an array.**

- Use an array to demonstrate how to find the factors of 20 by circling one row and one column. Indicate that the quantities in the circled row and column can be counted to find the factors.



There are 20 total shapes in the array, and it has 4 rows and 5 columns, so 20 has the factors 4 and 5.

- Ask students to identify the factors of 20 using a different array of 20. Ask students to identify the numbers of stars in one row and one column to find the factors 2 and 10.

- Ask students to identify the factors when given a variety of arrays of sizes 4, 6, 10, 15, and 20.

❑ **Identify the factors of 4, 6, 10, 15, and 20 when given a multiplication sentence.**

- Use a multiplication sentence to demonstrate how to find the factors of 15. Indicate that the factors are the numbers being multiplied and the product or answer is 15.

$$(5) \times (3) = 15$$

The factors in the multiplication sentence are 5 and 3.

- Ask students to identify the factors when given a variety of multiplication sentences (e.g., 2 × 2 = 4, 1 × 6 = 6, 10 × 2 = 20).

Prerequisite Extended Indicators

MAE 3.12.f—Count the number of twos in four, six, and eight and the number of threes in six and nine, using a model.

MAE 3.1.2.e—Multiply one and two by ten, twenty, and thirty up to 60.

Key Terms

array, column, factor, factor tree, multiplication sentence, product, row

Additional Resources or Links

http://tasks.illustrativemathematics.org/content-standards/4/OA/B/4/tasks/938

http://nlvm.usu.edu/en/nav/frames_asid_202_g_2_t_1.html

(Note: Java required for website. Most recent version recommended, but not needed.)

MA 4.1.1.f

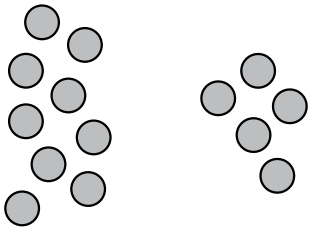
Compare whole numbers up to one million and decimals through the hundredths place using >, <, and = symbols, and visual representations.

Extended: Use symbols <, >, and = to compare whole numbers up to 40.

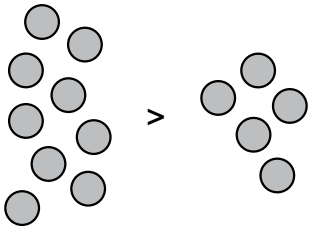
Scaffolding Activities for the Extended Indicator

❑ **Use <, >, and = symbols to visually compare quantities.**

- Present objects in two groups. The quantities in the two groups should be different enough that it is possible to recognize which group has more or less objects without counting.



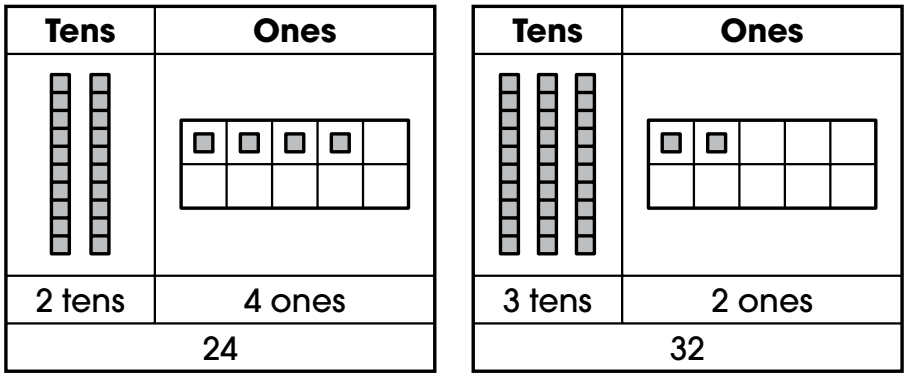
Ask questions about the quantities of the two groups. Does each group have the same amount? Which group has more? Which group has less? Demonstrate using the inequality symbols to indicate which group has more (and less). Indicate how the symbols always "open" to the larger quantity.



- Ask students to compare various quantities of objects using the symbols.
- Ask students to compare various quantities by supplying an initial quantity and then having students set a second quantity that is to be greater or less than the given quantity.

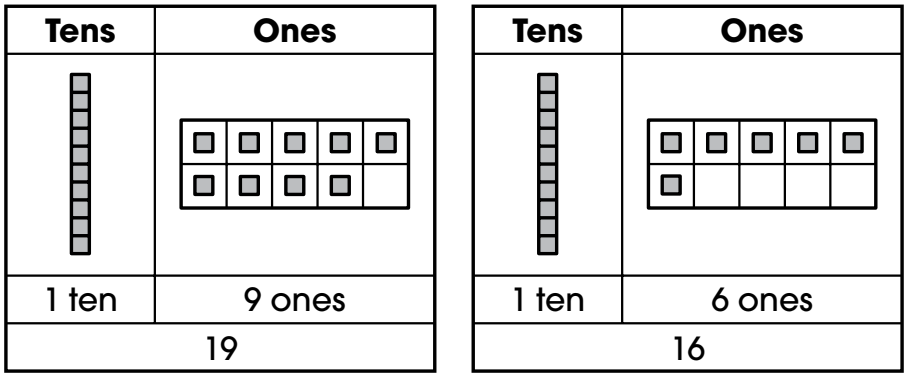
❑ **Use base-ten blocks and base-ten mats to compare whole numbers up to 40.**

- Use base-ten blocks and mats to demonstrate how to compare the value of whole numbers. Indicate that the 2 in the tens column represents 2 tens in 24 and the 3 in the tens column represents 3 tens in 32. Since 2 tens is less than 3 tens, 24 is less than 32.



24 < 32

- Use base-ten blocks and mats to demonstrate how to compare values in the ones place. For example, create a comparison of the values 19 and 16.



19 > 16

In this case, the tens place values are equal. However, there are 9 ones in the number 19, and there are 6 ones in the number 16. Since 9 ones is greater than 6 ones, 19 is greater than 16. Be sure to include examples of equal whole numbers such as 12 and 12.

- Ask students to compare other whole numbers up to 40 with different values in the tens place, such as 35 and 18.
- Ask students to compare other whole numbers up to 40 with the same number of tens, such as 25 and 27, and equivalent whole numbers up to 40, such as 27 and 27.

Prerequisite Extended Indicator

MAE 3.1.1.b—Compare and order whole numbers, 1–20.

Key Terms

amount, compare, equal to, greater than, less than, ones, quantity, symbols, tens

Additional Resources or Links

https://www.engageny.org/resource/grade-1-mathematics-module-4-topic-b-lesson-7

http://tasks.illustrativemathematics.org/content-standards/1/NBT/B/3/tasks/1102

MA 4.1.1.g

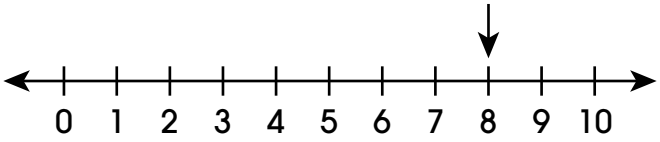
Round a multi-digit whole number to any given place.

Extended: Round a 2-digit number, 1–100, to the nearest ten using a number line.

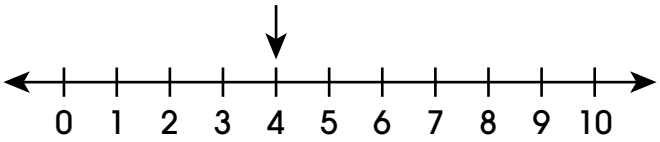
Scaffolding Activities for the Extended Indicator

❑ **Round a single-digit number to 0 or 10 using a number line.**

- Introduce the concept of rounding. Explain that sometimes an exact number is not needed, only an estimate or about how much is needed. Provide relevant examples of using an estimate or approximate number.
- Use a number line to demonstrate that the location of a single-digit number on a number line can be closer to 0 or 10.

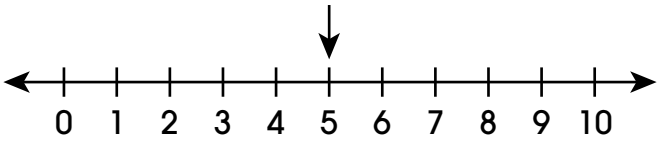


The number 8 is closer to 10 than 0, so it rounds to 10.



The number 4 is closer to 0 than 10, so it rounds to 0.

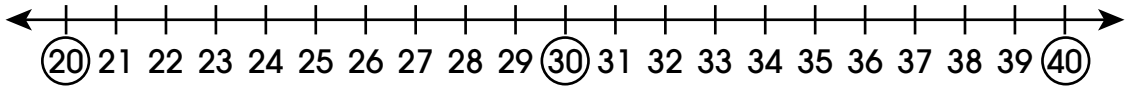
- Explain that the number 5 is the same distance from 0 as it is from 10, so in the case of 5, the number is always rounded up to 10.



- Ask students to round a single-digit number to 0 or 10 by pointing to a given number on a number line.

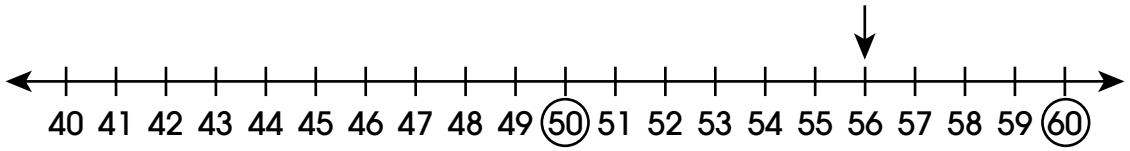
❑ **Round a 2-digit number to the nearest ten using a number line.**

- Demonstrate finding the tens on a number line. Any 2-digit number that is a multiple of ten will end with zero.



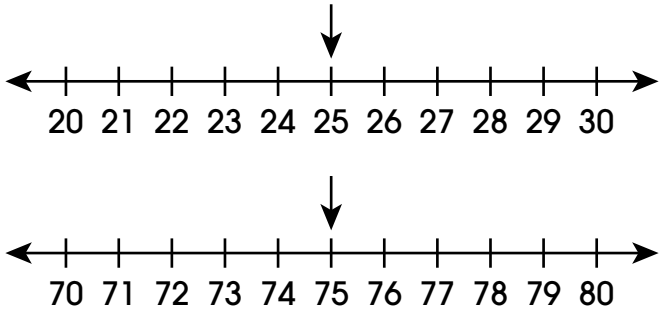
For students who can skip-count by 10, relate that skill to finding the multiples of ten on the number line.

- Ask students to identify all the multiples of ten when provided a number line from 0 to 100 or sections of a number line.
- Demonstrate finding the number 56 on a number line and then finding the multiples of ten that 56 is located in between.



The number 56 is in between 50 and 60, so those numbers can be circled or highlighted.

- Ask students to find the multiples of ten that are on either side of various 2-digit numbers when provided a number line from 0 to 100 or sections of a number line.
- Demonstrate that once the two multiples of ten on either side of a number are found, the next step to rounding is to choose the multiple of ten that is nearest to that number on the number line. From the example above, 56 is nearest to 60, so it rounds to 60.
- Explain that 5 rounds to 10 and any number ending in a 5 will round to the multiple of ten to the right of that number on a number line or to the larger number.



- Ask students to round various 2-digit numbers to the nearest ten using a number line from 0 to 100 or a section of a number line. Be sure to include numbers with a 5 in the ones place.

Prerequisite Extended Indicators

MAE 4.1.1.d—Count by twos and fives, and tens with numbers, models, or objects up to 40.

MAE 3.1.1.c—Identify a number closer to a given number on a number line, 1–20.

Key Terms

nearest, number line, round, ten

Additional Resources or Links

https://www.mathlearningcenter.org/apps/number-line

http://tasks.illustrativemathematics.org/content-standards/3/NBT/A/1/tasks/1805

MA 4.1.1.h

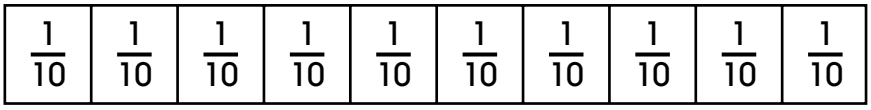
Use decimal notation for fractions with denominators of 10 or 100.

Extended: Identify decimals on a number line from 0 to 1 (tenths only).

Scaffolding Activities for the Extended Indicator

❑ **Identify that a whole can be divided into ten equally sized pieces and those pieces are called tenths.**

- Use real objects to demonstrate that a whole can be divided into ten equally sized pieces called tenths. This can be done by cutting straws, modeling with base-ten blocks, or using other objects.

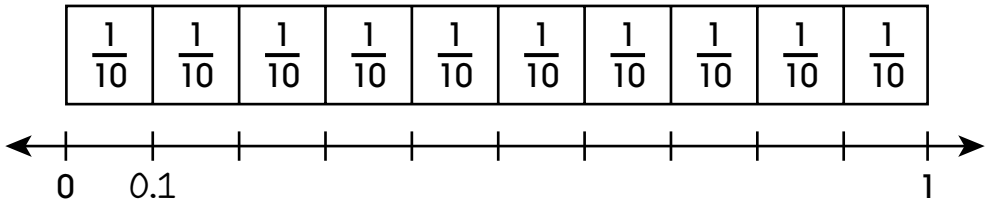


For students who understand that halves and fourths are formed when a whole is divided into two and four equally sized pieces, relate that skill to tenths.

- Ask students to count the number of pieces of a whole that has been divided into tenths. Then ask students to identify various amounts (e.g., two-tenths, six-tenths).

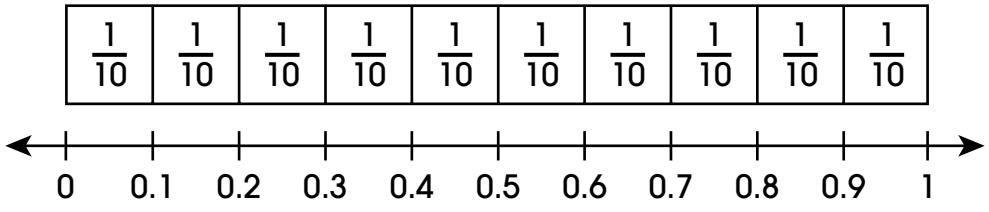
❑ **Equate the language of tenths to decimal numbers. For example, three-tenths is 0.3.**

- Connect the ten equally sized pieces of the whole to a number line from 0 to 1, with decimal numbers to represent the tenths.



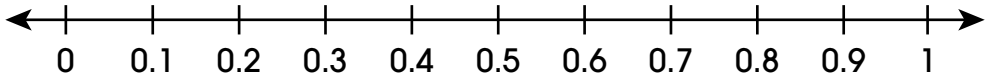
Begin with a number line that shows 0 and 1 with no numbers below the 9 inner tick marks. Write 0.1 and say, “One-tenth,” write 0.2 and say, “Two-tenths,” and so on to connect the equally sized pieces with the concept of tenths as decimal numbers.

- Ask students to count the number of pieces of a whole in a real object that has been divided into tenths and placed above a number line from 0 to 1, labeled with tenths. Then ask students to identify a number on the number line.



❑ **Identify tenths on a number line from 0 to 1 without using manipulatives.**

- Demonstrate that a number line from 0 to 1 can be divided into ten equally sized intervals (or sections) and each of those intervals is called a tenth.



  The numbers below each tick mark are decimal numbers, and each represents how many tenths there are: one-tenth or 0.1, two-tenths or 0.2, and so on.

- Ask students to identify tenths on a number line from 0 to 1 when given the name (e.g., seven-tenths) or the decimal number (e.g., 0.7).

Prerequisite Extended Indicator

MAE 3.1.1.d—Represent halves and wholes on a number line.

Key Terms

decimal, interval, number line, section, tenth

Additional Resources or Links

https://www.mathlearningcenter.org/apps/number-line

MA 4.1.1.k

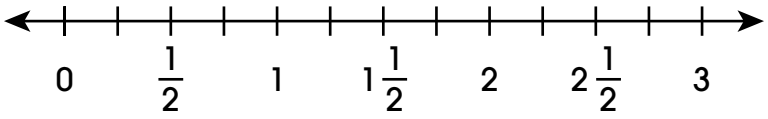
Compare and order fractions having unlike numerators and unlike denominators using visual representations (number line), comparison symbols and verbal reasoning (e.g., using benchmarks or common numerators or common denominators).

Extended: Compare and order mixed numbers with fourths and halves less than 3.

Scaffolding Activities for the Extended Indicator

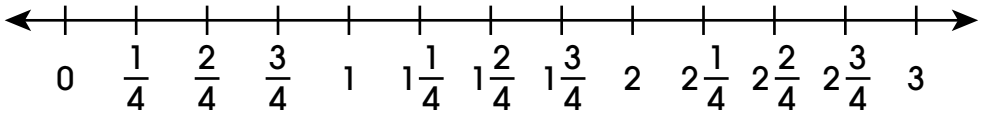
❑ **Identify mixed numbers on a number line.**

- Use a number line from 0 to 3 to show the location of mixed numbers with halves. Present a number line as shown with tick marks at each fourth and labels for the wholes and halves.



  The mixed numbers are $1\frac{1}{2}$ and $2\frac{1}{2}$. Explain that mixed numbers have a fraction after the whole number. Emphasize that the fraction $\frac{1}{2}$ on a number line is between 0 and 1 and extending the number line past 1 to include 2 and 3 will also include the mixed numbers $1\frac{1}{2}$ and $2\frac{1}{2}$.

- Ask students to identify the whole numbers on a number line from 0 to 3.
- Ask students to identify the fractions $\frac{1}{2}$, $1\frac{1}{2}$, and $2\frac{1}{2}$ on a number line from 0 to 3.
- Use a number line from 0 to 3 to show the location of mixed numbers with fourths. Present a number line as shown with tick marks and labels at each fourth and whole number.

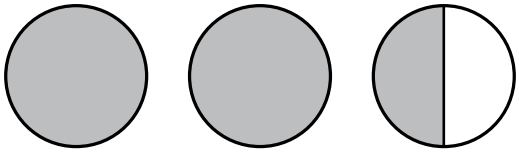


  Explain that the fractions in this number line have a denominator of 4. If appropriate, indicate that $1\frac{2}{4}$ is in the same location as $1\frac{1}{2}$, meaning those are equal numbers.

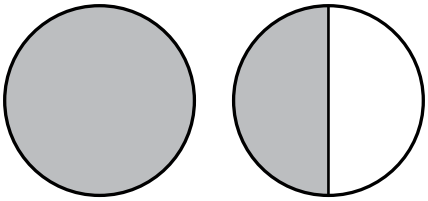
- Ask students to identify the whole numbers on a number line from 0 to 3.
- Ask students to identify the fractions between 0 and 1 on a number line.
- Ask students to identify the mixed numbers with fourths from 1 to 3 on a number line.

❑ Identify mixed numbers in a model.

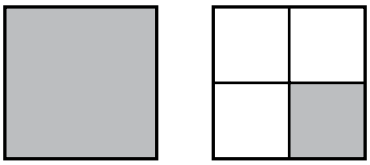
- Use models to show the value of mixed numbers. Explain that a shaded circle represents one whole and that two shaded circles represent the whole number 2. Indicate the model for $2\frac{1}{2}$ as 2 whole circles shaded and $\frac{1}{2}$ of another circle shaded.



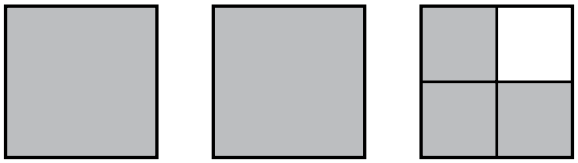
Indicate the model for $1\frac{1}{2}$.



Use the same method of modeling to show mixed numbers with fourths. For example, the large square shown represents one whole, so the entire figure shows $1\frac{1}{4}$.



Use the same large square as the whole and model other mixed numbers, such as $2\frac{3}{4}$.

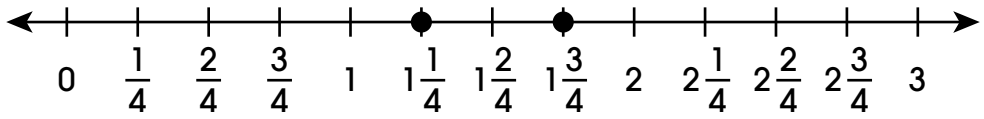


Continue to show a variety of models (using shapes such as circles, squares, and rectangles) to represent the mixed numbers from 1 to 3 with halves and fourths.

- Ask students to use a model to identify the mixed numbers $1\frac{1}{2}$ and $2\frac{1}{2}$.
- Ask students to use a model to identify the mixed numbers with fourths between 1 and 3.

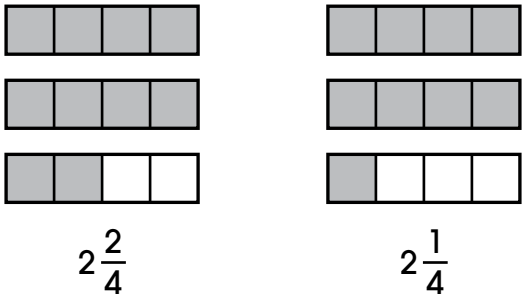
❑ Compare mixed numbers.

- Use a number line to show how to compare mixed numbers. Present a number line as shown with points at the locations $1\frac{1}{4}$ and $1\frac{3}{4}$. Explain that numbers on a number line go from left to right, getting greater the farther to the right they are located. So, $1\frac{3}{4}$ is greater than $1\frac{1}{4}$ because $1\frac{3}{4}$ is farther to the right.



Continue to demonstrate comparing other mixed numbers between 1 and 3 using number lines with halves labeled, number lines with fourths labeled, and when appropriate, number lines with halves and fourths labeled to show equivalencies between $\frac{1}{2}$ and $\frac{2}{4}$.

- Ask students to compare mixed numbers with halves on a number line.
- Ask students to compare mixed numbers with fourths on a number line.
- Ask students to compare mixed numbers with halves and fourths on a number line.
- Use a model to compare mixed numbers. Explain that each rectangle shown is one whole and that each rectangle is divided into four equal pieces called fourths.

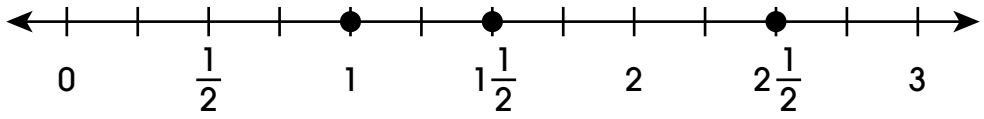


Make note that each model has 2 wholes, but the first model has 2 fourths shaded and the second model has only 1 fourth shaded. So, $2\frac{2}{4}$ is greater than $2\frac{1}{4}$. Show a variety of models of mixed numbers from 1 to 3 using halves and fourths.

- Ask students to use models to compare mixed numbers with halves.
- Ask students to use models to compare mixed numbers with fourths.
- Ask students to use models to compare mixed numbers with halves and fourths.

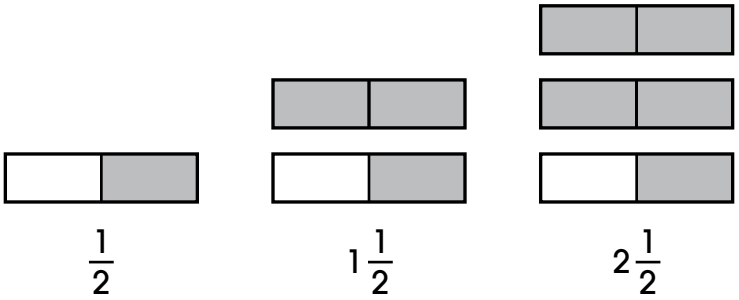
❑ **Order mixed numbers.**

Use a number line to show how to order mixed numbers from least to greatest. Present a number line as shown with points located at 1, $1\frac{1}{2}$, and $2\frac{1}{2}$. Explain that to order the numbers from least to greatest, the points should be read from left to right. For this example, the order is 1, $1\frac{1}{2}$, $2\frac{1}{2}$.



Continue to demonstrate ordering mixed numbers between 1 and 3 using number lines with halves labeled, number lines with fourths labeled, and when appropriate, number lines with halves and fourths labeled to show equivalencies between $\frac{1}{2}$ and $\frac{2}{4}$.

- Use a model to order mixed numbers from least to greatest. Present models for $2\frac{1}{2}$, $\frac{1}{2}$, and $1\frac{1}{2}$ in random order and then demonstrate ordering the mixed numbers from least to greatest, as shown.



Continue to demonstrate using models to order mixed numbers from 1 to 3 with basic shapes divided into halves, fourths, and when appropriate, halves and fourths.

- Ask students to order mixed numbers with fourths and halves from 1 to 3 using a number line.
- Ask students to order mixed numbers with fourths and halves from 1 to 3 using models.

Prerequisite Extended Indicators

MAE 3.1.1.i—Use a model to compare unit fractions one-half, one-third, and one-fourth.

MAE 3.1.1.e—Given a model, represent a whole number (1–3) as a fraction with a denominator of 2, 3, or 4.

MAE 3.1.1.d—Represent halves and wholes on a number line.

Key Terms

fourth, fraction, greatest, half, least, less, mixed number, more, whole number

Additional Resources or Links

https://apps.mathlearningcenter.org/

http://nlvm.usu.edu/en/nav/frames_asid_159_g_2_t_1.html?from=category_g_2_t_1.html

(Note: Java required for website. Most recent version recommended, but not needed.)

http://tasks.illustrativemathematics.org/content-standards/3/NF/A/3/tasks/875

MA 4.1.2 Operations

MA 4.1.2.b

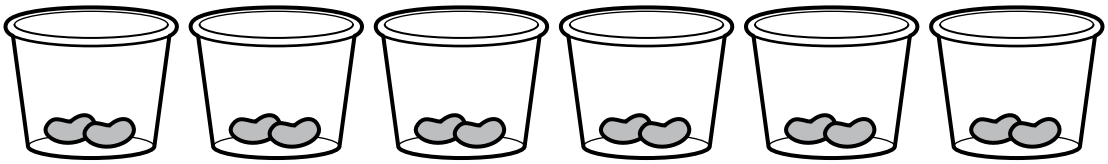
Multiply a four-digit whole number by a one-digit whole number.

Extended: Multiply 2's, 5's and 10's by a single digit number.

Scaffolding Activities for the Extended Indicator

❑ **Multiply 2 by a single-digit number.**

- Explain that 6 × 2 means 6 groups of 2. Use manipulatives in groups of 2 to model 6 × 2. Demonstrate finding the total (product) by counting the manipulatives or skip-counting by twos and record the answer, 6 × 2 = 12.

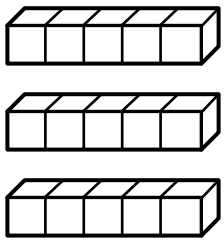


Next, write the expression 2 × 6 and indicate that this math expression means 2 groups of 6. Show the same manipulatives in 2 groups of 6. Count the manipulatives to find the total (product) and record the answer, 2 × 6 = 12. Reinforce the idea that the product (answer) was the same for 6 × 2 and 2 × 6. Continue using manipulatives to demonstrate 2 multiplied by a single-digit number when 2 is the first factor and when 2 is the second factor (for example, 2 × 4 as 2 groups of 4, and 4 × 2 as 4 groups of 2). Refer to instructional support 4.1.1.d for skip-counting strategies and supports.

- Ask students to multiply a single-digit number by 2 using manipulatives in groups of 2.

❑ **Multiply 5 by a single-digit number.**

- Explain that 3 × 5 means 3 groups of 5. Use manipulatives in groups of 5 to model 3 × 5. Demonstrate finding the total (product) by counting the manipulatives or skip-counting by fives and record the answer, 3 × 5 = 15.

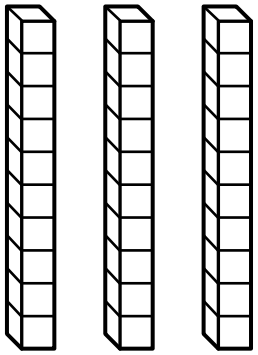


Repeat the process to model the expression 5 × 3 as 5 groups of 3 using the same manipulatives and resulting in the same answer.

- Ask students to multiply a single-digit number by 5 using manipulatives in groups of 5.

❑ **Multiply 10 by a single-digit number.**

- Explain that 3 × 10 means 3 groups of 10. Use manipulatives in groups of 10 to model 3 × 10. Demonstrate finding the total (product) by counting the manipulatives, skip-counting by tens, or using repeat addition and record the answer, 3 × 10 = 30.



When appropriate, describe the relationship between multiples of 10 times a single-digit number (i.e., know that 10 × 3 = 30 based on notions of place value).

- Ask students to multiply a single-digit number by 10 using manipulatives in groups of 10 or by applying the concept of place value.

Prerequisite Extended Indicators

MAE 4.1.1.d—Count by twos and fives, and tens with numbers, models, or objects up to 40.

MAE 4.1.1.a—Identify representations of numbers 0–100.

MAE 3.1.2.c—Use a model to show multiplication as repeat addition with a product no greater than 20.

Key Terms

groups, multiply, ones, place value, product, same, tens

Additional Resources or Links

https://www.engageny.org/resource/grade-3-mathematics-module-1

https://www.engageny.org/resource/grade-3-mathematics-module-1-topic-e-lesson-14

https://www.engageny.org/resource/grade-3-mathematics-module-1-topic-f-lesson-19

MA 4.1.2.c

Multiply a two-digit whole number by a two-digit whole number using the standard algorithm.

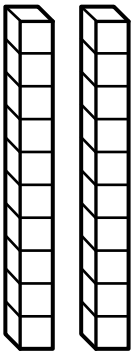
Extended: Multiply two-digit multiples of 10 by 2 or 5.

Scaffolding Activities for the Extended Indicator

❑ **Use manipulatives and repeated addition to multiply two-digit multiples of 10 by 2.**

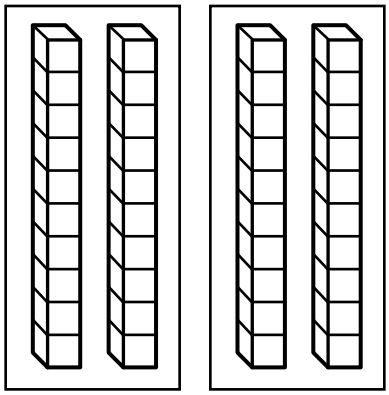
- Use base ten blocks to represent 10 multiplied by 2.

10 × 2

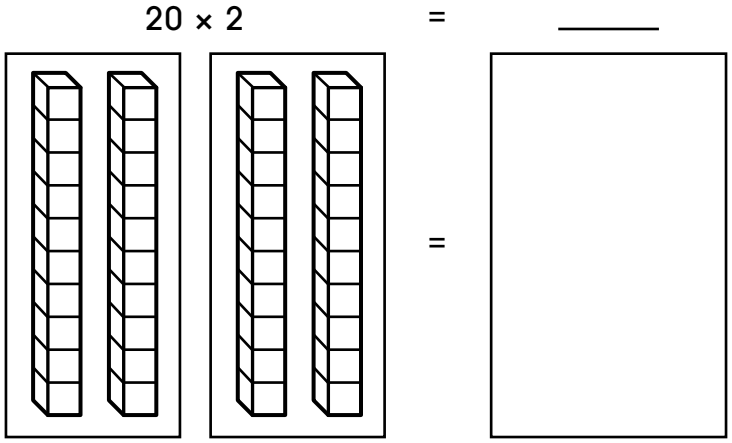


Demonstrate the same process with the base ten blocks for representing 20, 30, 40, and 50 multiplied by 2. For example, 20 × 2 is represented by two groups of 20 blocks as shown.

20 × 2



- Demonstrate a strategy to find the total number of base ten blocks (the product) for 20 × 2. Use strategies such as skip counting by ten, placing base ten blocks on a hundreds grid or other templates to provide support for skip counting by ten, or repeated addition. Write the total number of base ten blocks (the product) on the blank line or in the box.

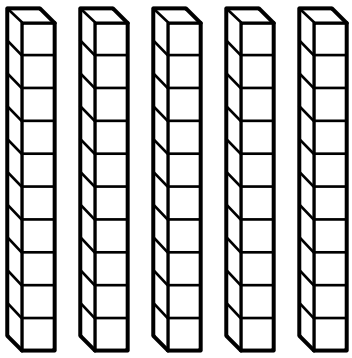


- Ask students to find the products of multiples of 10 and 2 using base ten blocks or other real-life objects in groups of ten. When appropriate, demonstrate additional skip counting by 10 or other counting strategies that lead to finding the products without manipulatives.

❑ **Use manipulatives and repeated addition to multiply two-digit multiples of 10 by 5.**

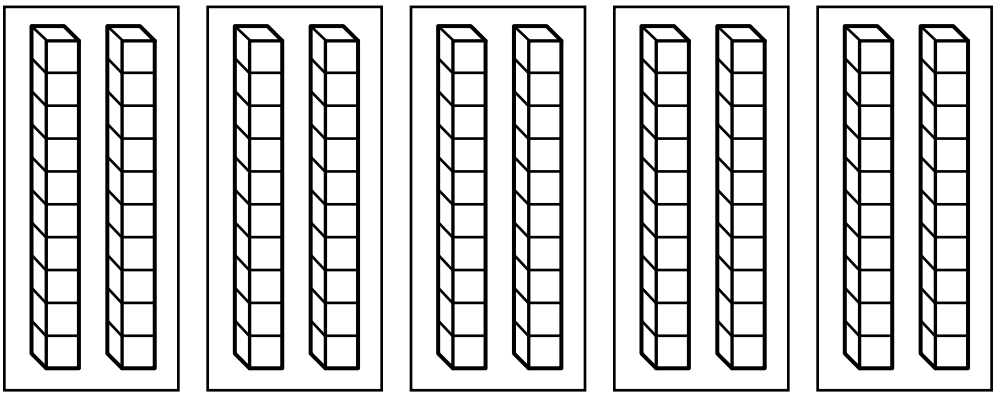
- Use base ten blocks to represent 10 multiplied by 5.

10 × 5



Demonstrate the same process with the base ten blocks for representing 20, 30, 40, and 50 multiplied by 5. For example, 20 × 5 is represented by five groups of 20 blocks as shown.

20 × 5



- Demonstrate a strategy to find the total number of base ten blocks (the product) for 20 × 5. Use strategies such as skip counting by ten, placing base ten blocks on a hundreds grid(s) or other template to provide support for skip counting by ten, or repeated addition.
- Ask students to find the products of multiples of 10 and 5 using base ten blocks or other real-life objects in groups of ten. When appropriate, demonstrate additional skip counting by 10 or other counting strategies that lead to finding the products without manipulatives.

Prerequisite Extended Indicators

MAE 4.1.1.d—Count by twos and fives, and tens with numbers, models, or objects up to 40.

MAE 3.1.2.e—Multiply one and two by ten, twenty, and thirty up to 60.

MAE 3.1.2.c—Use a model to show multiplication as repeat addition with a product no greater than 20.

Key Terms

multiples of 10, multiplication, product, repeated addition, skip counting

Additional Resources or Links

http://tasks.illustrativemathematics.org/content-standards/3/NBT/A/3/tasks/1445

https://www.engageny.org/resource/grade-3-mathematics-module-3-topic-f-overview

MA 4.1.2.d

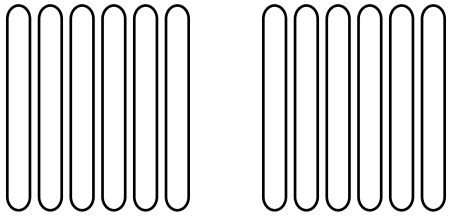
Divide up to a four-digit whole number by a one-digit divisor with and without a remainder.

Extended: Identify numbers 2–20 in equal-size groups.

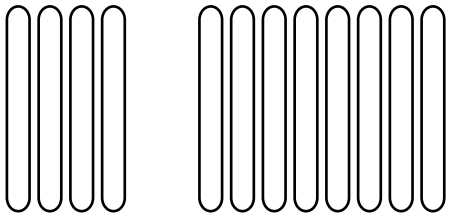
Scaffolding Activities for the Extended Indicator

❑ **Identify equal-size groups of real-life objects.**

- Use manipulatives to show up to 20 objects in groups. For example, present two groups of 6 craft sticks each. Count the number of craft sticks in each group and indicate that the amount is the same for each group; therefore, equal-size groups are shown.



Next, rearrange the same 12 craft sticks into two groups of unequal size. Count the number of craft sticks in each group and indicate that the groups do not have the same amount; therefore, the groups are not of equal size.

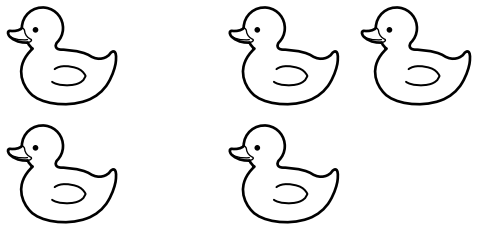


Repeat the process with the same 12 craft sticks, making three groups of equal size and then three groups of unequal size, as well as four groups and six groups, since 12 can be divided by all those numbers evenly. Continue to demonstrate using a variety of objects and varying the total number of objects from 2 to 20.

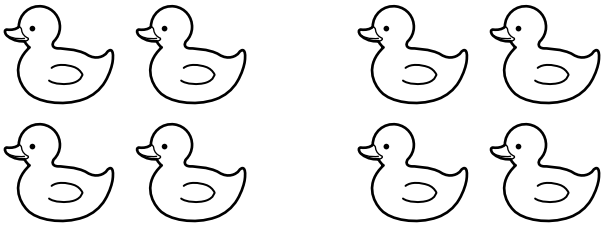
- Ask students to identify whether two groups of real-life objects are of equal size. For example, present a group of 3 markers and a group of 5 markers and ask students whether equal-size groups are shown.

- Ask students to identify equal-size groups of real-life objects. For example, present groups of objects as shown and ask which option has equal-size groups. Students should determine that option B has equal-size groups.

Option A

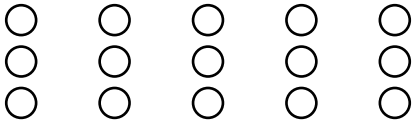


Option B

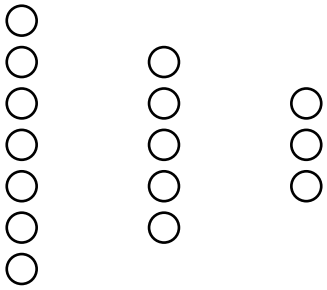


❑ **Identify equal-size groups in a drawing.**

- Use drawings to show up to 20 objects in groups. For example, present circles in groups as shown. Count to find the size of each group and determine that the groups are of equal size.



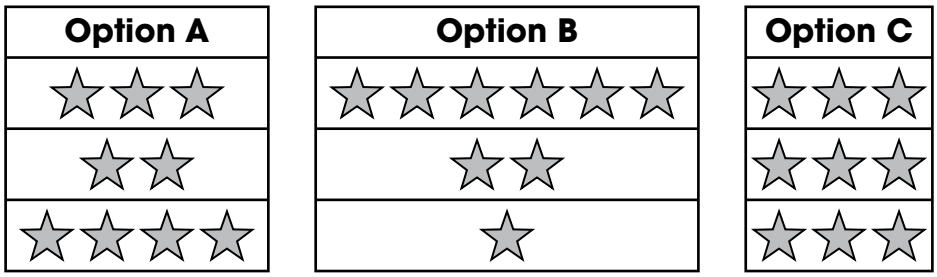
Draw the same number of circles in three groups to show groups of different sizes. Count how many circles are in each group and determine that the groups are not of equal size.



Continue to demonstrate with a variety of drawings, using shapes or tally marks, to show groups of equal sizes and groups of different sizes.

- Ask students to identify whether two groups in a drawing are of equal size. For example, present a drawing of 6 triangles in one group and 3 triangles in another group and ask students whether equal-size groups are shown.

- Ask students to identify equal-size groups of objects in a drawing. For example, show students the following figure and ask which option has groups of equal size. Students should determine that option C has equal-size groups.



Prerequisite Extended Indicators

MAE 4.1.1.c—Identify odd and even numbers up to 20.

MAE 3.1.2.f—Count the number of twos in four, six, and eight and the number of threes in six and nine, using a model.

Key Terms

amount, equal, group

Additional Resources or Links

https://www.engageny.org/resource/grade-2-mathematics-module-6-topic-lesson-1

https://www.engageny.org/resource/grade-2-mathematics-module-6-topic-a-lesson-4

MA 4.1.2.f

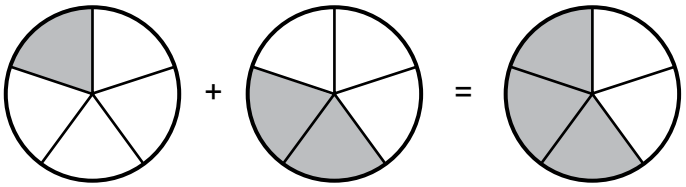
Add and subtract fractions and mixed numbers with like denominators.

Extended: Add and subtract halves to halves, thirds to thirds, fourths to fourths, and fifths to fifths . . . to a whole.

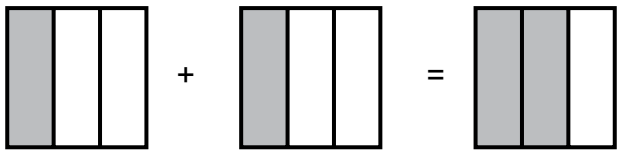
Scaffolding Activities for the Extended Indicator

❑ **Add fractions with like denominators.**

- Use models to demonstrate adding fractions with like denominators. For example, to add $\frac{1}{5} + \frac{2}{5}$, circle models can be used, with each circle representing one whole and each whole divided into 5 equal parts. The shaded parts of the circles represent the addition problem $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$.



Continue to demonstrate adding other fractions with like denominators using a variety of shapes and models. The model shown can be used to demonstrate $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$.

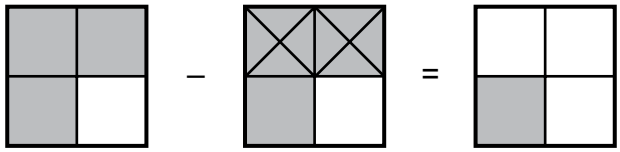


Demonstrate adding fractions with models that represent adding halves to halves, thirds to thirds, fourths to fourths, and fifths to fifths. Emphasize that the denominator always stays the same in the sum and that the numerator in the sum is the sum of the numerators that are given. When appropriate, progress to adding fractions without using a model.

- Ask students to add fractions with like denominators using a model.
- Ask students to add fractions with like denominators without using a model.

❑ Subtract fractions with like denominators.

- Use models to demonstrate subtracting fractions with like denominators. Present the model shown to demonstrate $\frac{3}{4} - \frac{2}{4}$. Each square represents one whole and is divided into 4 equal parts. To subtract, 2 of the fourths are removed from the 3 fourths, represented by the crossed-off fourths in the second square. The shaded part of the last square shows that the difference is 1 fourth, so $\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$.



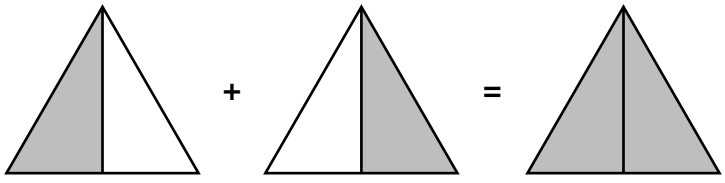
Emphasize that the denominator does not change when subtracting (or adding) fractions. The answer still has a 4 in the denominator, and the numerator is the difference of the given numerators.

Demonstrate subtracting fractions with models that represent subtracting halves from halves, thirds from thirds, fourths from fourths, and fifths from fifths. Emphasize that the denominator always stays the same in the difference and that the numerator in the difference is the difference of the numerators that are given. When appropriate, progress to subtracting fractions without using a model.

- Ask students to subtract fractions with like denominators using a model.
- Ask students to subtract fractions with like denominators without using a model.

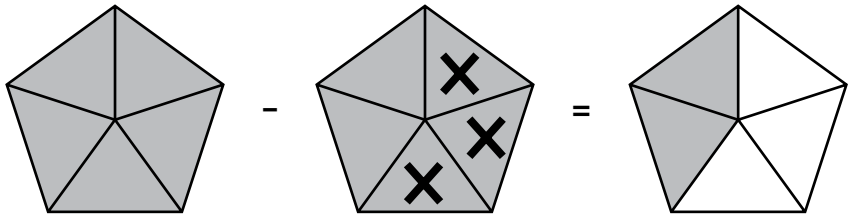
❑ Add and subtract fractions with a whole.

- Use models to demonstrate adding fractions to equal one whole. Present the model shown to demonstrate $\frac{1}{2} + \frac{1}{2}$. Each triangle represents one whole, so the shaded parts represent $\frac{1}{2} + \frac{1}{2} = 1$.



Show models of thirds, fourths, and fifths that sum to 1 whole. Emphasize the pattern that when the numerator and the denominator are the same, the fraction is equal to 1 (i.e., $\frac{2}{2} = 1$, $\frac{3}{3} = 1$, $\frac{4}{4} = 1$, and $\frac{5}{5} = 1$).

Use models to demonstrate subtracting fractions from one whole. Present the model shown to demonstrate $\frac{5}{5} - \frac{3}{5}$. The first pentagon represents one whole, and the second shows subtracting $\frac{3}{5}$, so the model represents $\frac{5}{5} - \frac{3}{5} = \frac{2}{5}$.



Show models of halves, thirds, fourths, and fifths subtracted from one whole. When appropriate, progress to adding and subtracting fractions with a whole without using a model.

- Ask students to add and subtract fractions with a whole using a model.
- Ask students to add and subtract fractions with a whole without using a model.

Prerequisite Extended Indicators

MAE 3.1.2.a—Add and subtract, through 20 without regrouping.

MAE 3.1.1.i—Use a model to compare unit fractions one-half, one-third, and one-fourth.

Key Terms

add, denominator, difference, fifth, fourth, fraction, half, numerator, subtract, sum, third, whole

Additional Resources or Links

https://www.engageny.org/resource/grade-4-mathematics-module-5

https://www.insidemathematics.org/common-core-resources/3rd-grade

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Mathematics—Grade 4
MA 4.2 Algebra

MA 4.2.1 Algebraic Relationships

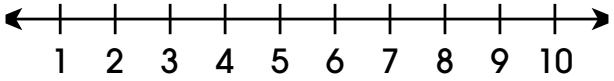
MA 4.2.1.a

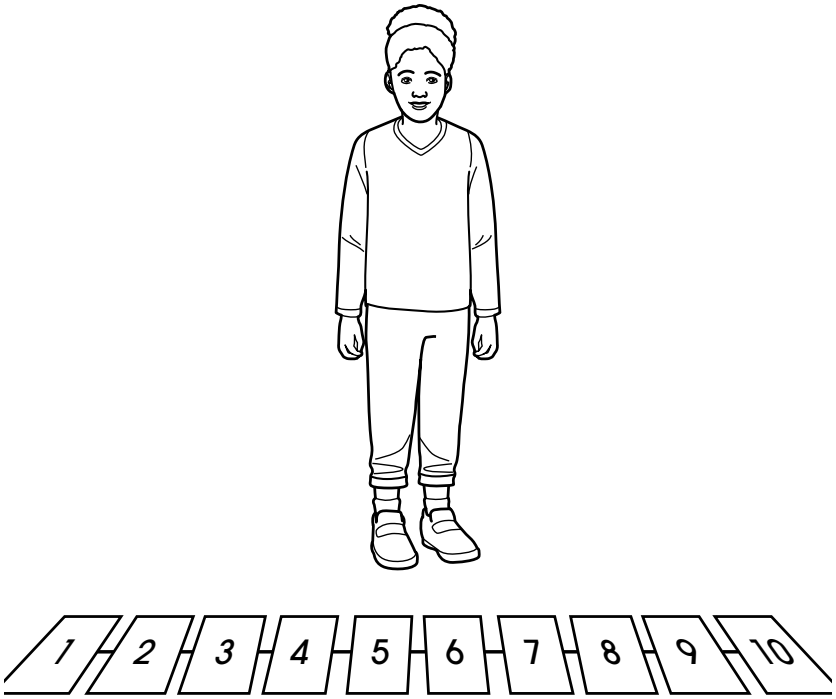
Create a simple algebraic expression or equation using a variable for an unknown number to represent a math process (e.g., 3 + *n* = 15, 81 ÷ *n* = 9).

Extended: Solve simple one-step single-digit equations using addition or subtraction.

Scaffolding Activities for the Extended Indicator

- ❑ **Use a horizontal number line representing whole numbers 0 through 10 to solve subtraction equations.**
  - Use a horizontal number line to demonstrate how to find the missing number in a subtraction equation. For example, model solving the subtraction sentence 8 – 2 = ? on a number line. Indicate that the question mark answers the question "What is 8 minus 2?" Model the subtraction by starting at the 8 and counting 2 units to the left to show that 8 take away 2 is 6.
  - Use the subtraction sentence 9 – ? = 8. Indicate that the question mark is asking "How much do you take away from 9 to get 8?" Model the subtraction problem by starting at the 9 and counting the number of units to get to 8. Use a variety of methods to model the subtraction problem (e.g., stand next to a number line and count the number of steps; count the number of arcs, sometimes referred to as hops, drawn above a number line while moving to a different number on the number line; use a created or purchased number line slider board).

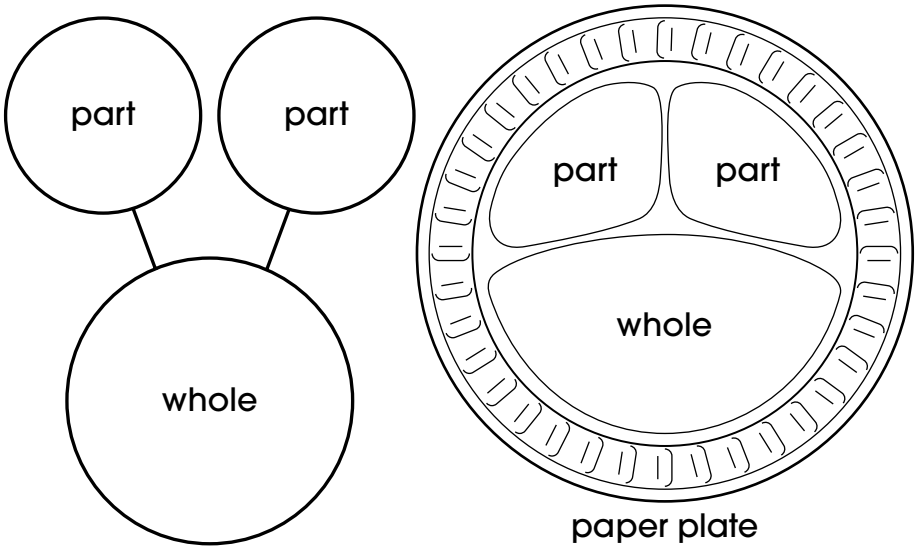




- Ask students to use a horizontal number line and one of the techniques demonstrated to solve for the difference in a subtraction equation, such as 5 – 3 = ? or 9 – 1 = ?.
- Ask students to use a horizontal number line and one of the techniques demonstrated to solve for a subtrahend in a subtraction equation, such as 5 – ? = 4 or 8 – ? = 5.

❑ **Use a part-part-whole method to solve single-digit addition equations.**

- Use a part-part-whole model to demonstrate how to find the missing number in an addition equation. For example, model 4 + 4 = ? by describing the process aloud. The process is to place 4 objects in one of the areas designated “part” and place another 4 objects in the other area designated “part.” Then, move all the objects from the areas designated “part” to the area designated “whole” and count all the objects to find the total.
- Model 6 + ? = 9 by describing the process aloud. The process is to place 9 objects in the area designated “whole.” Then, move 6 objects to one of the areas designated “part.” Move the remaining pieces from the area designated “whole” to the other area designated “part” while counting the number of objects.



- Ask students to use the part-part-whole model to solve for the sum in an addition equation, such as 6 + 2 = ? or 4 + 5 = ?.
- Ask students to use the part-part-whole model to solve for an addend in an addition equation, such as 6 + ? = 7 or ? + 1 = 2.

Prerequisite Extended Indicators

MAE 3.2.2.b—Solve a one-step equation for sums and differences 0–9.

MAE 3.1.2.a—Add and subtract, through 20 without regrouping.

Key Terms

add, equation, missing number, subtract

Additional Resources or Links

https://www.insidemathematics.org/sites/default/files/materials/digging%20dinosaurs.pdf

http://tasks.illustrativemathematics.org/content-standards/1/OA/D/8/tasks/4

MA 4.2.2 Algebraic Processes

MA 4.2.2.a

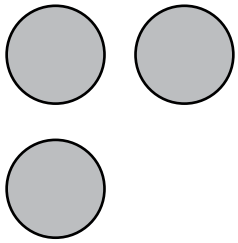
Solve one- and two-step problems that use any or all of the four basic operations and include the use of a letter to represent the unknown quantity.

Extended: Evaluate numerical expressions using order of operations using numbers 1 through 5.

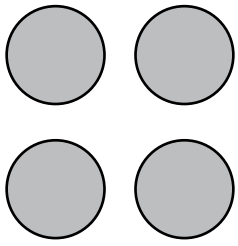
Scaffolding Activities for the Extended Indicator

❑ **Evaluate numerical expressions with addition and subtraction using numbers 1 through 5.**

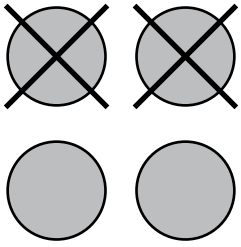
- Explain that a numerical expression (or math problem) can have more than one operation. The expression 3 + 1 – 2 has two operations, addition and subtraction. To solve this problem, first add and then subtract. Explain that when solving problems with more than one operation, there is a certain order to follow. When solving problems with addition and subtraction, solve left to right. If addition comes first left to right, add first. If subtraction comes first left to right, subtract first.
- Model evaluating 3 + 1 – 2 with manipulatives. Start with 3 tokens.



Add 1 more token.



Then, take 2 away and the answer is 2.



Count the number of tokens left, and the answer is 2.
Therefore, 3 + 1 – 2 = 2.

- Continue modeling how to evaluate numerical expressions using manipulatives, number lines, calculators, or any other familiar counting or computation strategy while emphasizing that the order of operations is from left to right.

5 + 4	1 + 5 – 3	5 – 2 + 4	4 + 4 – 5

- Ask students to use a strategy to evaluate numerical expressions with addition and subtraction.

❑ **Evaluate numerical expressions with addition or subtraction and multiplication using numbers 1 through 5.**

- Explain that when a numerical expression (or math problem) has multiplication and addition or multiplication and subtraction, the multiplication is done first regardless of its location in the problem.
- Demonstrate identifying the multiplication part of the problem by highlighting, underlining, circling, etc.

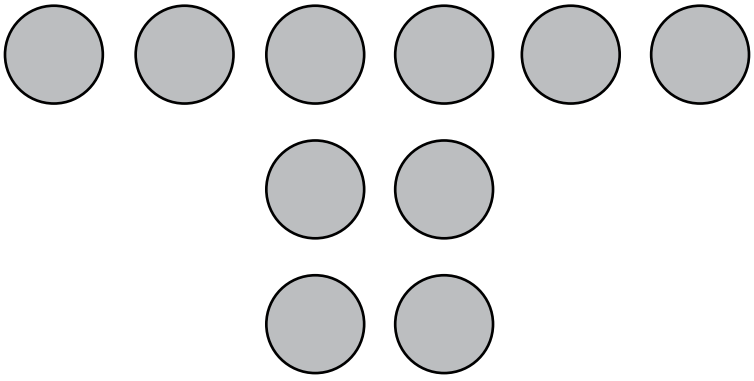
2 × 3 + 1	4 – 1 × 3	5 + 4 × 2	5 × 5 – 4

- Ask students to identify the multiplication part of the problem.

3 × 2 + 5	5 × 3 – 4	5 – 2 × 2	3 + 3 × 4

- Model evaluating 4 + 2 × 3 with manipulatives. Since multiplication is in the problem, it is the first step. Make two groups of three tokens (2 × 3).

Add 4 more tokens.



Count all the tokens, and the answer is 10.

Therefore, 4 + 2 × 3 = 10.

- Continue modeling how to evaluate numerical expressions using manipulatives, number lines, calculators, or any other familiar counting or computation strategy while emphasizing that the order of operations is multiplication first, then the addition or subtraction.

4 × 2 + 1	4 × 5 – 3	3 – 1 × 2	2 + 4 × 3

- Ask students to use a strategy to evaluate numerical expressions with addition or subtraction and multiplication.

Prerequisite Extended Indicators

MAE 3.1.2.c—Use a model to show multiplication as repeat addition with a product no greater than 20.

MAE 3.1.2.a—Add and subtract through 20 without regrouping.

Key Terms

add, multiply, numerical expression, operation, order of operations, subtract

Additional Resources or Links

https://curriculum.illustrativemathematics.org/k5/teachers/grade-3/unit-3/lesson-20/lesson.html

https://www.engageny.org/resource/grade-3-mathematics-module-1

MA 4.2.3 Applications

MA 4.2.3.a

Solve real-world problems involving multi-step equations comprised of whole numbers using the four operations, including interpreting remainders.

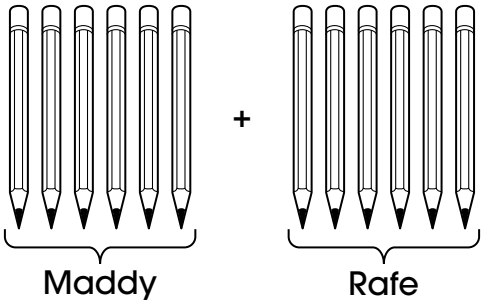
Extended: Solve addition and subtraction real-world problems with addition and subtraction up to 40 without regrouping.

Scaffolding Activities for the Extended Indicator

❑ **Solve one-step addition or subtraction problems using visual models.**

- Use manipulatives or drawings to demonstrate creating a visual model that represents a real-world addition or subtraction problem. Present the real-world scenario and figure shown below. Demonstrate counting or adding 6 + 6 to find the total number of 12 pencils.

Maddy has 6 pencils. Rafe has 6 pencils.
How many pencils do they have altogether?



Continue to demonstrate solving a variety of addition and subtraction problems using visual models that represent real-world scenarios and numbers up to 40.

- Ask students to identify the correct model for a one-step real-world addition problem when given two or more choices of models. Repeat for a subtraction problem.
- Ask students to solve a one-step real-world addition problem using a visual model. Repeat for a subtraction problem.

❑ **Solve one-step addition or subtraction problems using equations.**

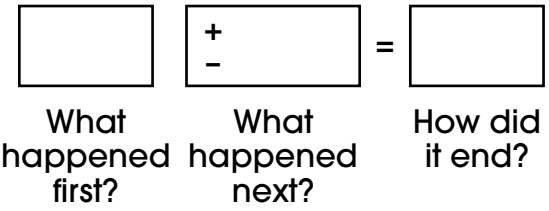
- Use a template to create equations that represent real-world addition or subtraction problems. Present the following scenario.

  Brett makes 36 muffins for a bake sale.

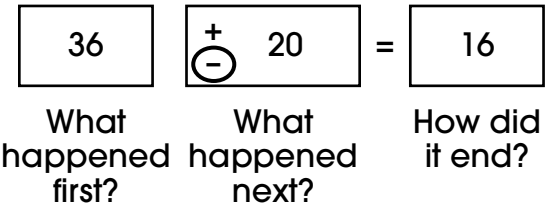
  He sells 20 muffins.

  How many muffins remain?

Present a template to demonstrate organizing the information in the real-world problem.



Demonstrate writing 36 in the first box to represent the 36 muffins Brett made. Emphasize that selling the muffins indicates that this is a subtraction problem. Circle subtraction on the template, and then write 20 for the number of muffins sold. Last, model calculating the answer using an appropriate computation method (e.g., standard algorithm, calculator, manipulatives).



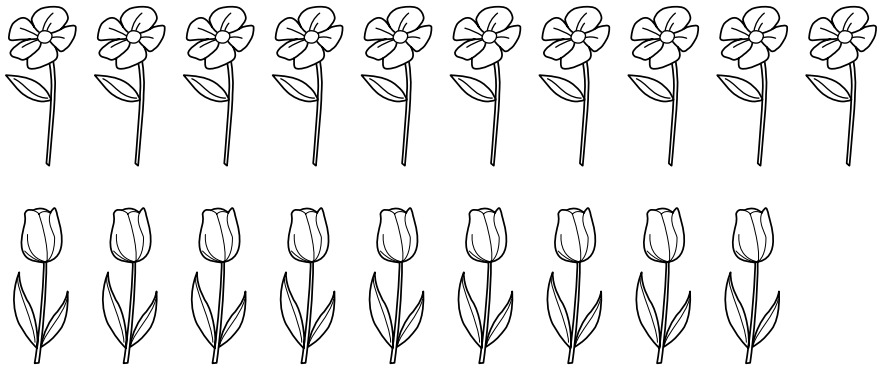
Continue to demonstrate solving a variety of addition and subtraction problems presented in real-world scenarios using equations and numbers up to 40.

- Ask students to identify the correct equation that represents a one-step addition problem when given a real-world scenario and a choice of two or more equations. Repeat for a one-step subtraction problem.
- Ask students to solve a one-step addition problem using an equation when given a real-world scenario. Repeat for a one-step subtraction problem.

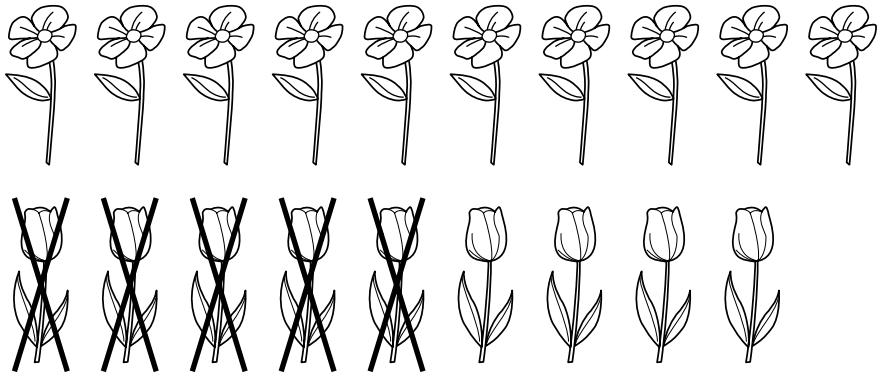
❑ **Solve two-step addition and subtraction problems using visual models.**

- Use visual models to demonstrate solving two-step real-world addition and subtraction problems. Present the following scenario: “Jonas makes a flower arrangement using 10 daises and 9 tulips. Jonas then removes 5 tulips from the flower arrangement. How many flowers remain in the flower arrangement?”

Demonstrate rereading the scenario one sentence at a time and then creating a drawing or using manipulatives to represent what is stated in each sentence. Start with a model of the ten flowers to represent the daises, and then add nine more flowers to the model to represent the tulips.



Next, cross off or remove five tulips.



Demonstrate counting the remaining flowers to find the answer of 14 flowers in the flower arrangement. This can be connected to the equation 10 + 9 – 5 = 14.

Continue to demonstrate solving a variety of two-step addition and subtraction problems using manipulatives, drawings, or other visual models and numbers up to 40.

- Ask students to identify the correct model for a two-step real-world addition and subtraction problem when given a choice of two or more models.
- Ask students to use a visual model to solve a two-step real-world addition and subtraction problem.

Prerequisite Extended Indicators

MAE 3.2.3.a—Solve a one-step real-world problem using addition or subtraction 0–9.

MAE 3.1.2.a—Add and subtract, through 20 without regrouping.

Key Terms

add, difference, subtract, sum

Additional Resources or Links

http://tasks.illustrativemathematics.org/content-standards/4/NF/B/3/tasks/968

https://www.engageny.org/resource/grade-4-mathematics-module-5-topic-d-overview/file/77296

MA 4.2.3.b

Solve real-world problems involving addition and subtraction of fractions and mixed numbers with like denominators.

Extended: Solve addition real-world problems with halves and fourths.

Scaffolding Activities for the Extended Indicator

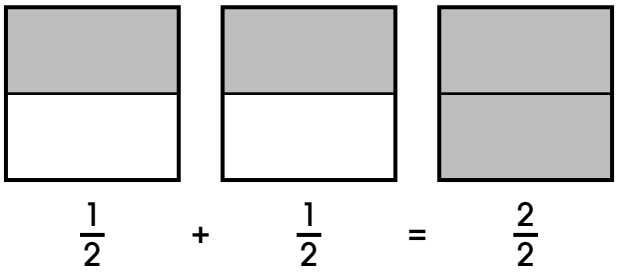
❑ **Solve addition real-world problems with halves.**

- Use models or manipulatives to demonstrate adding fractions from real-world problems with halves. Present the word problem and the model shown. Explain that the model shows a square to represent the whole garden, and the shaded parts are each $\frac{1}{2}$ of the whole garden. Two-halves, or $\frac{2}{2}$, is the same as one whole, so it can be written as the digit 1. Sammy's whole garden is planted because $\frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1$.

  Sammy plants $\frac{1}{2}$ of his garden with carrots.

  He also plants $\frac{1}{2}$ of his garden with onions.

  How much of Sammy's garden is planted?



  Continue to demonstrate how to solve a variety of real-world problems adding halves using models or manipulatives. When appropriate, progress to solving without models or manipulatives.

- Ask students to solve addition real-world problems with halves using models or manipulatives.
- Ask students to solve addition real-world problems with halves without using models or manipulatives.

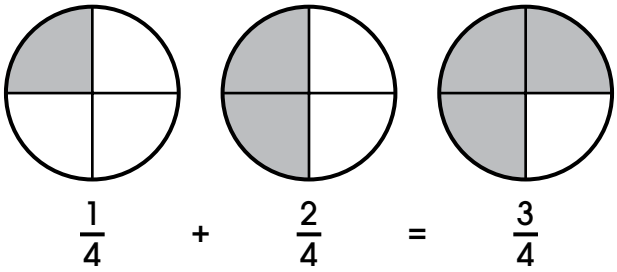
❑ **Solve addition real-world problems with fourths.**

- Use models or manipulatives to demonstrate adding fractions from real-world problems with fourths. Present the word problem and model shown. Explain that the model shows a circle to represent one whole inch of rain, and the shaded parts show how many fourths of an inch of rain fell. The total shows 3 fourths shaded, so the answer to the problem is $\frac{3}{4}$ inch.

Raisa is recording the amount of rain today.

It rained $\frac{1}{4}$ inch in the morning and $\frac{2}{4}$ inch in the afternoon.

How much rain fell today?



Continue to demonstrate solving a variety of real-world problems adding fourths using models and manipulatives. Be sure to include problems with a sum of $\frac{4}{4}$ to emphasize that $\frac{4}{4} = 1$. When appropriate, progress to solving without models or manipulatives.

- Ask students to solve addition real-world problems with fourths using models or manipulatives.
- Ask students to solve addition real-world problems with fourths without using models or manipulatives.

Prerequisite Extended Indicators

MAE 4.2.3.a—Solve addition and subtraction real-world problems with addition and subtraction up to 40 without regrouping.

MAE 4.1.2.f—Add and subtract halves to halves, thirds to thirds, fourths to fourths, and fifths to fifths . . . to a whole.

Key Terms

add, denominator, fourth, half, numerator, sum

Additional Resources or Links

http://tasks.illustrativemathematics.org/content-standards/4/NF/B/3/tasks/856

https://www.engageny.org/resource/grade-4-mathematics-module-5-topic-d-overview/file/77296

Mathematics—Grade 4
MA 4.3 Geometry

MA 4.3.1 Characteristics

MA 4.3.1.b

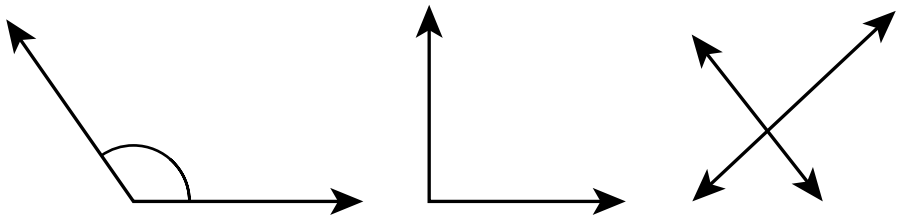
Classify an angle as acute, obtuse, or right.

Extended: Compare larger and smaller angles.

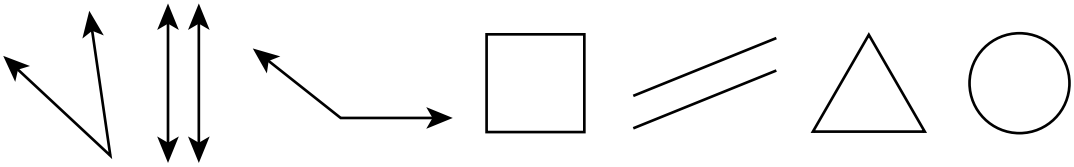
Scaffolding Activities for the Extended Indicator

❑ **Identify angles.**

- Explain that angles form where two rays share a common endpoint and where two lines or line segments intersect. Sometimes angles are marked with a symbol (indicate the arc symbol).



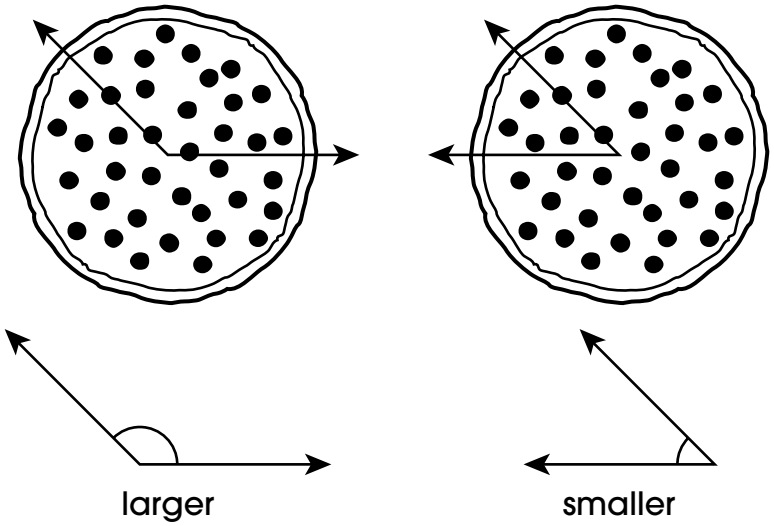
- Explain that angles can be found in real life. Model identifying various angles around the classroom. Most shapes have angles, so any shape found in the classroom can be used to demonstrate finding angles (e.g., corner of a book or door, where the floor meets the wall).
- Model identifying which figures have angles.



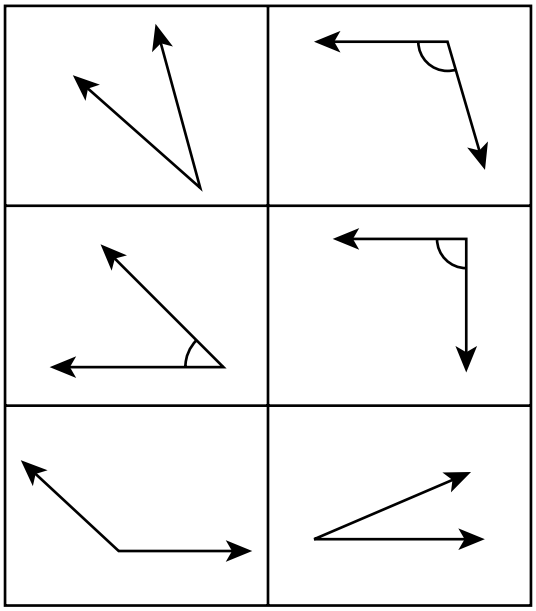
- Ask students to identify figures with angles.

❑ **Compare larger and smaller angles.**

- Explain that the size of angles can be compared by looking at the distance between the two rays. When the rays are close together, it is a small angle, and when the rays are farther apart, it is a large angle. This can also be demonstrated by putting the angle at the center of a circle and noting how much of the circle the angle takes up. Think of it like slices of pizza—the larger angle makes a bigger slice.



- Use manipulatives to compare angles. For example, use two strips of paper attached at the end of each piece with a brass paper fastener, bendable straws, or pipe cleaners to model comparing two angles to determine which angle is larger or smaller.



- Ask students to compare two angles and identify which angle is larger or smaller.

Prerequisite Extended Indicator

MAE 3.3.1.a—Identify the number of sides or angles in a regular polygon.

Key Terms

angle, larger, line, line segment, ray, smaller, vertex

Additional Resources or Links

https://www.engageny.org/resource/grade-4-mathematics-module-4-topic-lesson-1

https://www.engageny.org/resource/grade-4-mathematics-module-4-topic-lesson-2

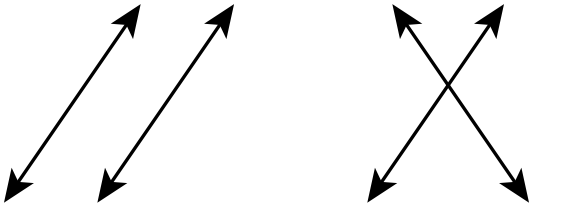
MA 4.3.1.c

Identify and draw points, lines, line segments, rays, angles, parallel lines, perpendicular lines, and intersecting lines, and recognize them in two-dimensional figures.

Extended: Identify parallel and intersecting lines.

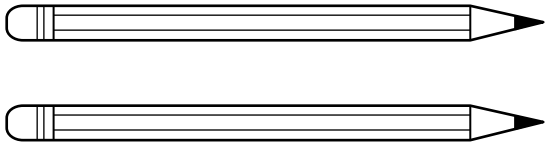
Scaffolding Activities for the Extended Indicator

- ❑ **Use manipulatives to identify parallel and intersecting lines. Parallel lines never touch and are always the same distance apart. Intersecting lines touch or cross each other.**

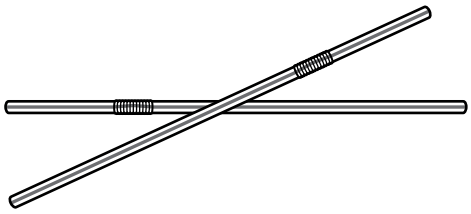


parallel lines intersecting lines

- Use manipulatives (pencils, pipe cleaners, spaghetti noodles, straws, etc.) to represent parallel lines and emphasize that parallel lines are always the same distance apart and never touch. (Note: Manipulatives resemble line segments more than lines, but they are used here and in the next bullet as models to represent lines.)



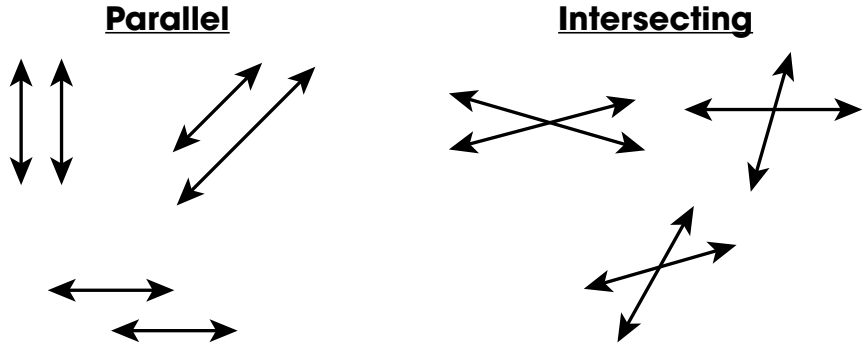
- Use manipulatives (pencils, pipe cleaners, spaghetti noodles, straws, etc.) to represent intersecting lines and emphasize that intersecting lines cross each other or touch.



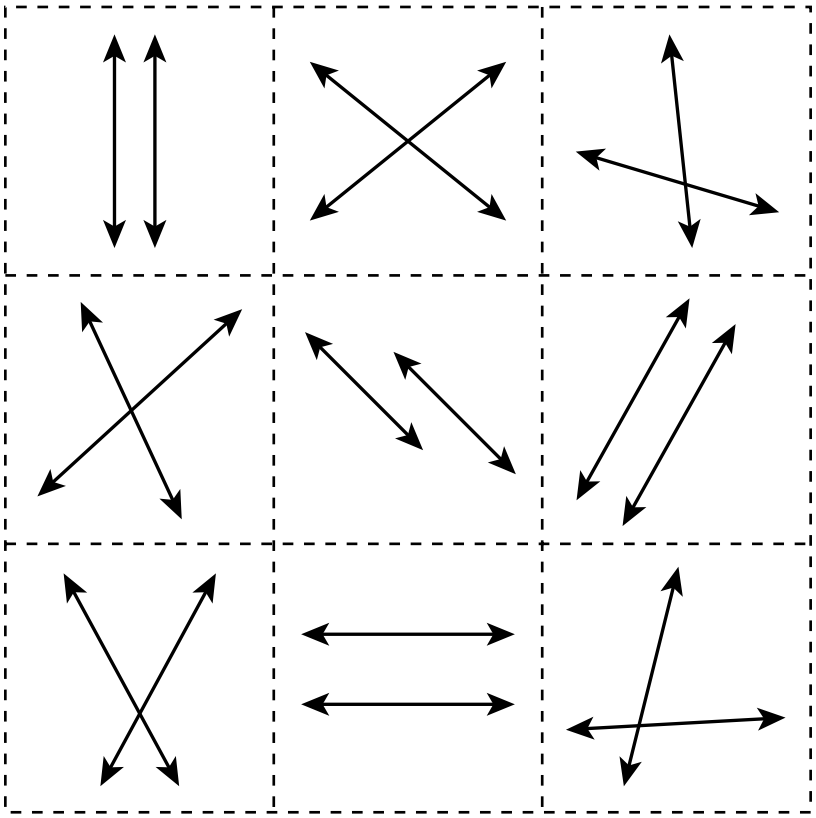
parallel lines intersecting lines

- Use manipulatives to represent a pair of parallel lines and a pair of intersecting lines. Ask students to identify which pair is parallel and which pair is intersecting.
- Use manipulatives to represent multiple pairs of parallel lines and multiple pairs of intersecting lines. Ask students to identify all pairs of parallel lines and all pairs of intersecting lines.

- ❑ **Use images to identify parallel and intersecting lines.**
  - Use images to demonstrate the difference between parallel and intersecting lines.



  - Ask students to sort pairs of parallel and intersecting lines in a two-column chart with one column labeled parallel and one column labeled intersecting.



Prerequisite Skills

Recognize lines and their different orientations in real-world objects.

Recognize lines drawn on two-dimensional shapes.

Key Terms

intersecting, line, parallel

Additional Resources or Links

http://tasks.illustrativemathematics.org/content-standards/4/G/A/1/tasks/1263

https://www.engageny.org/resource/grade-4-mathematics-module-4-topic-overview

MA 4.3.1.d

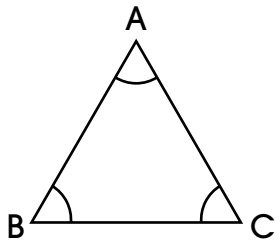
Classify two-dimensional shapes based on the presence or absence of parallel and perpendicular lines, or the presence or absence of specific angles.

Extended: Identify acute, right, and obtuse triangles.

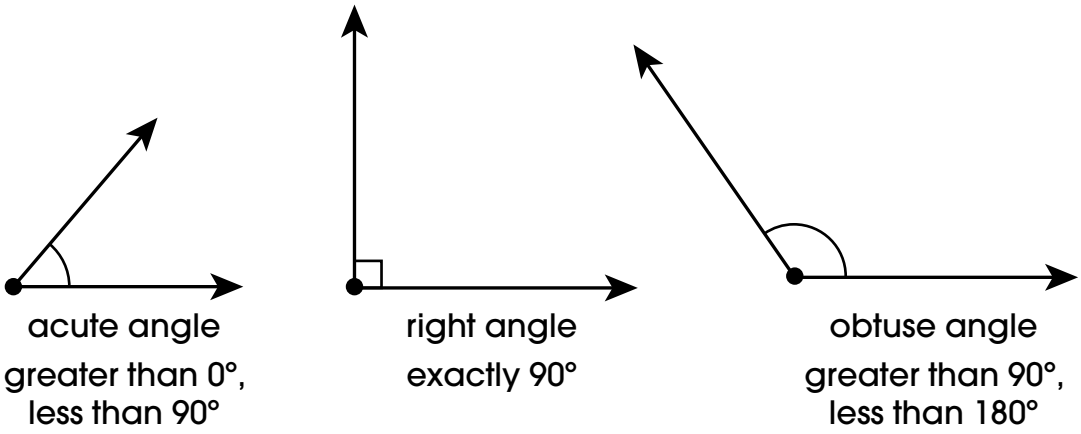
Scaffolding Activities for the Extended Indicator

❑ **Identify acute triangles.**

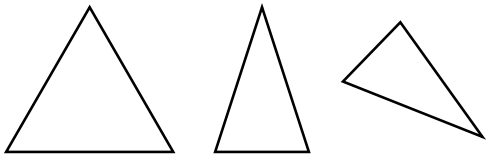
- Use manipulatives to show how to identify acute triangles. Use three pipe cleaners of the same length to demonstrate making a polygon with three sides. Identify the polygon as a triangle with three sides and three angles. Label the three angles.



Present a diagram showing an acute angle, a right angle, and an obtuse angle.

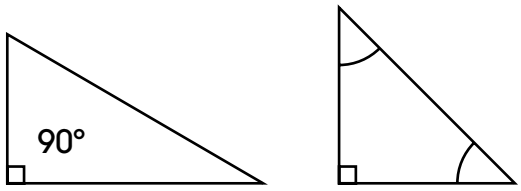


Identify the angles A, B, and C as being less than 90° and acute. Explain that a triangle that has three acute angles is called an acute triangle. Show different acute triangles.



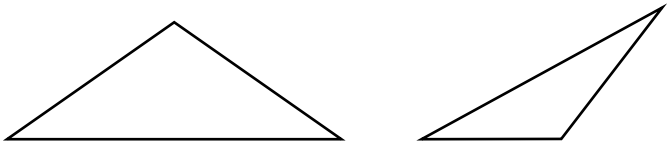
- Ask students to identify acute triangles.

- ❑ **Identify right triangles.**
  - Use manipulatives to draw right triangles. Start with an index card, a pipe cleaner, and a piece of paper. Wrap the pipe cleaner around one of the corners of the index card. Remove the index card, place the pipe cleaner on the piece of paper, and trace along the pipe cleaner to draw a 90° angle. Draw the third side of the triangle with a straightedge. Label the right angle with the right-angle symbol and 90°. Explain that a triangle with one right angle is a right triangle. Be sure to show or create examples of both isosceles and scalene right triangles.



  - Ask students to identify right triangles.

- ❑ **Identify obtuse triangles.**
  - Use manipulatives to draw obtuse triangles. Start with an index card, a pipe cleaner, and a piece of paper. Wrap the pipe cleaner around one of the corners of the index card. Indicate that to create an obtuse triangle, an angle greater than 90° is needed. Demonstrate creating an angle greater than 90° with the pipe cleaner to make an obtuse angle. Trace the obtuse angle on the piece of paper. Draw the third side of the triangle with a straightedge. Other examples of manipulatives that can be used to form angles include two pieces of paper attached with a brass tack, a pipe cleaner inserted in 2 straws, or a bendable straw. Explain that an obtuse triangle has one angle that is greater than 90°. Be sure to show or create examples of both isosceles and scalene obtuse triangles.



  - Ask students to identify obtuse triangles.

❑ **Identify acute, right, and obtuse triangles.**

- Use triangle manipulatives, cutouts, or drawings and a checklist to demonstrate how to identify a triangle as an acute, right, or obtuse triangle. Create a checklist that includes the following questions:

  ► Does the triangle have one right angle?
  ► Does the triangle have one obtuse angle?
  ► Does the triangle have three acute angles?

  Demonstrate comparing the angles of the triangle to diagrams of acute, right, and obtuse angles. Be sure to demonstrate with a variety of triangles for each category. Also, provide examples of right triangles in which the right angle is marked with the 90° symbol and examples in which the right angle is not identified.

- Ask students to identify a triangle as a right triangle, an obtuse triangle, or an acute triangle.

Prerequisite Extended Indicators

MAE 4.3.1.e—Identify right angles.

MAE 4.3.1.b—Compare larger and smaller angles.

MAE 3.3.1.a—Identify the number of sides or angles in a regular polygon.

Key Terms

acute angle, acute triangle, obtuse angle, obtuse triangle, right angle, right triangle, triangle

Additional Resources or Links

https://www.engageny.org/resource/grade-4-mathematics-module-4-topic-lesson-2

http://tasks.illustrativemathematics.org/content-standards/4/G/A/2/tasks/1273

MA 4.3.1.e

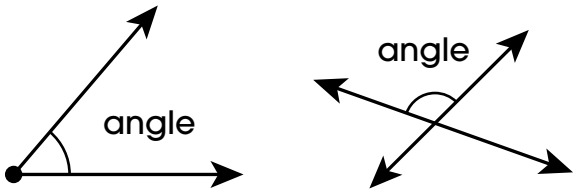
Identify right triangles.

Extended: Identify right angles.

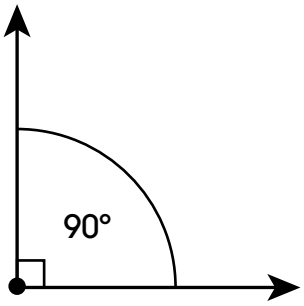
Scaffolding Activities for the Extended Indicator

❑ **Identify right angles throughout the classroom.**

- Explain that angles form where two rays share an endpoint and where two lines or line segments intersect.

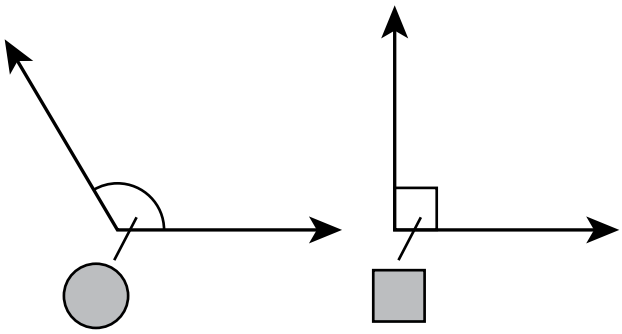


- Explain that right angles are special angles that measure exactly 90 degrees. Right angles look like the corners of a square, and therefore they are often marked with a square at the vertex instead of an arc.

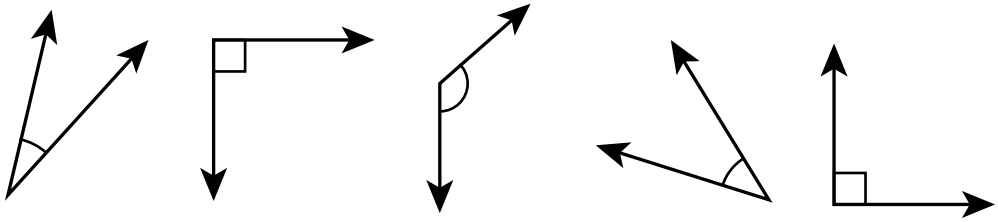


- Explain that right angles are found all around. Point out examples of right angles in the classroom, such as doorframes, ceiling tiles, floor tiles, bulletin boards, windows, etc.
- Ask students to identify several additional examples of right angles throughout the classroom.

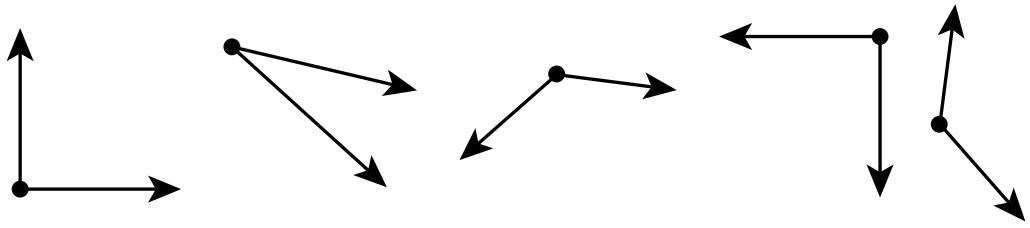
- ❑ **Differentiate between right angles and other angles.**
  - Use cutouts of a circle and a square to demonstrate the difference between the arc symbol used to indicate an acute or obtuse angle and the square symbol used to indicate a right angle by placing the circle cutout along the curve of the arc symbol and the square cutout on the edge of the square symbol.



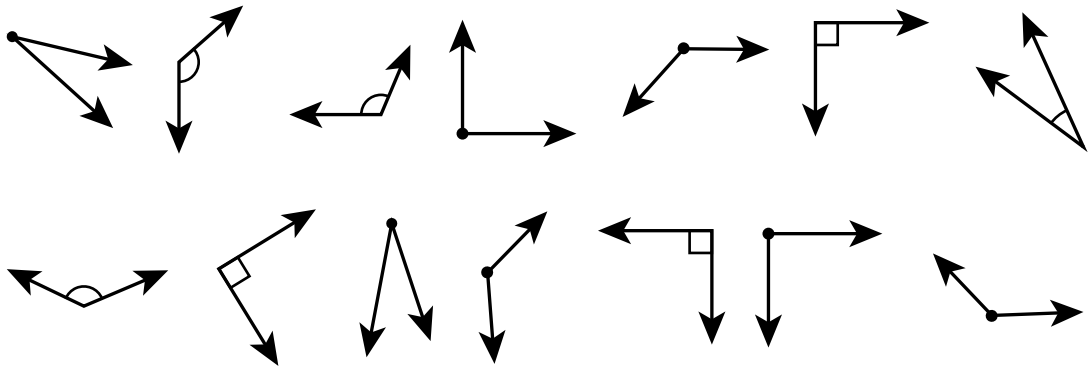
  - Model how to identify right angles by using a square cutout with a set of angles marked with symbols.



  - Ask students to identify all the right angles in a set of angles marked with a symbol.
  - Show examples of angles that are not marked with symbols and explain that symbols are not always used. Demonstrate how a right angle can be identified by placing a square in the angle or imagining whether a square would fit perfectly inside the angle.



- Ask students to identify all right angles in a set of angles in which some angles are marked with symbols and some angles are not marked with symbols.



Prerequisite Extended Indicators

MAE 4.3.1.b—Compare larger and smaller angles.

MAE 3.3.1.b—Identify two-dimensional shapes, circles, triangles, rectangles, or squares from a collection of circles, rectangles, and squares.

MAE 3.3.1.a—Identify the number of sides or angles in a regular polygon.

Key Terms

angle, arc, endpoint, ray, right angle, square, symbol, vertex

Additional Resources or Links

http://tasks.illustrativemathematics.org/content-standards/4/G/A/2/tasks/1273

https://www.engageny.org/resource/grade-4-mathematics-module-4-topic-lesson-2

https://www.engageny.org/resource/grade-4-mathematics-module-4-topic-lesson-3

MA 4.3.1.g

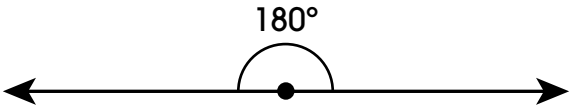
Sketch angles of a specified measure.

Extended: Identify 45°, 90°, and 180° angles without measuring.

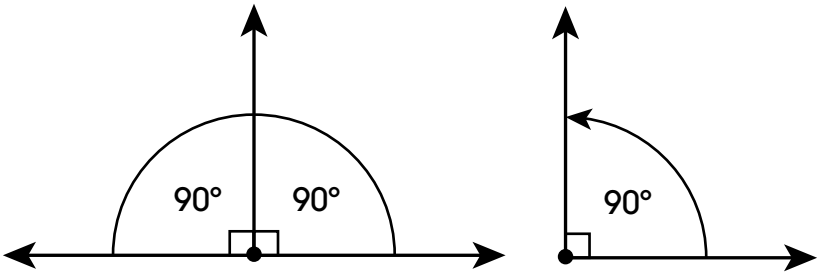
Scaffolding Activities for the Extended Indicator

❑ **Identify 45°, 90°, and 180° angles without measuring.**

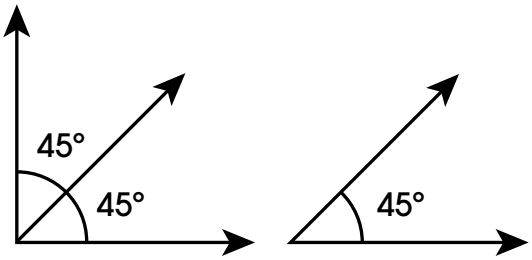
- Demonstrate that angles form when two rays share a common endpoint and when two lines or line segments intersect. When two rays join to create a line, the angle formed is 180°. Use manipulatives (straws, pipe cleaners, pencils, pens, crayons, spaghetti noodles, etc.) to model a 180° angle.



- Demonstrate that right angles are special angles that measure exactly 90 degrees. Right angles look like the corners of a square, and they are therefore often marked with a square at the vertex. Right angles are half of 180° (straight) angles. Use manipulatives (two straws with a pipe cleaner at the vertex or pencils, pens, crayons, spaghetti noodles, etc.) to model 180° and 90° angles.

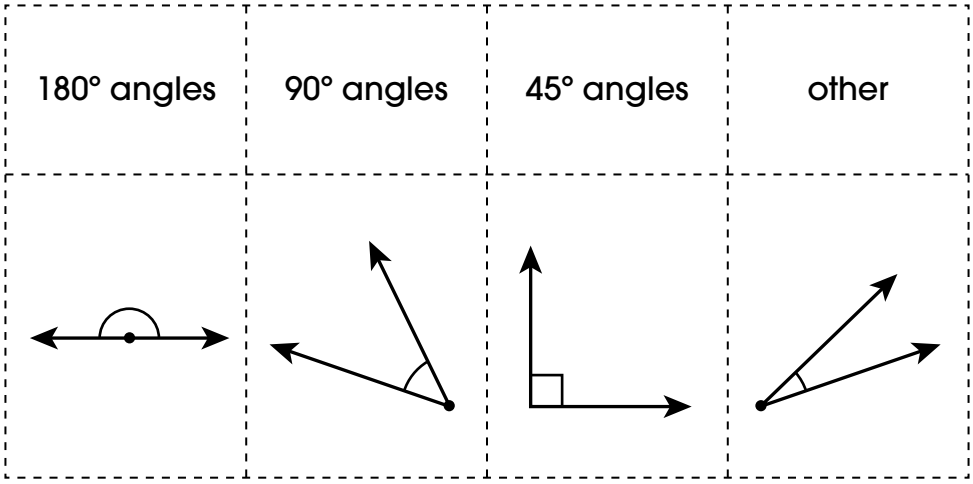


- Demonstrate that when a 90° angle is divided into two equal parts, each angle measures 45°. A 45° angle is half of a 90° angle. Use manipulatives (two straws with a pipe cleaner at the vertex or pencils, pens, crayons, spaghetti noodles, etc.) to model 90° and 45° angles.

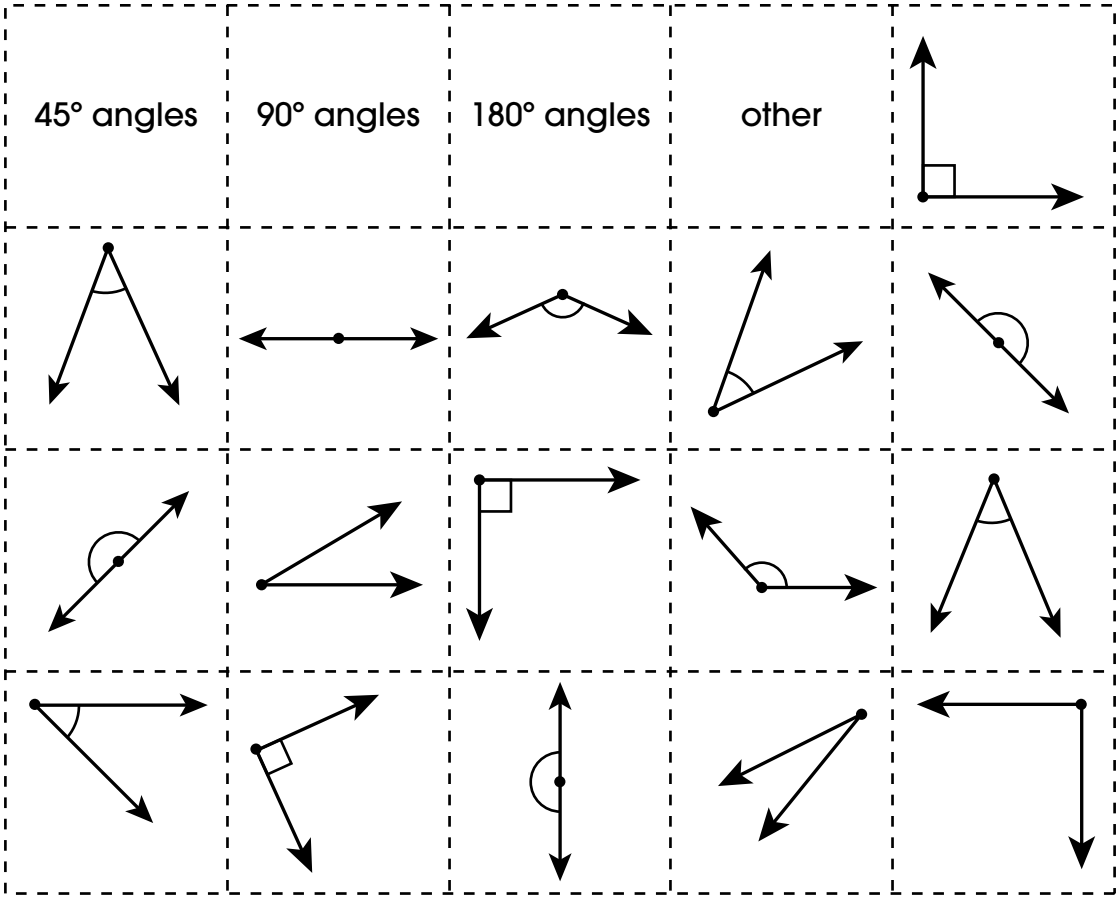


- Use manipulatives to represent multiple 45°, 90°, and 180° angles. Ask students to identify the 45° angles, the 90° angles, and the 180° angles.

- ❑ **Sort 45°, 90°, and 180° angles without measuring.**
  - Explain that a straight line is 180°, that half of 180° is 90° (right angle), and that half of 90° is 45°. Model identifying 180°, 90°, and 45° angles, and demonstrate sorting angles into four categories, including non-examples.



  - Ask students to sort angles into four categories: 180° angles, 90° angles, 45° angles, and other angles.



Prerequisite Extended Indicators

MAE 4.3.1.e—Identify right angles.

MAE 4.3.1.b—Compare larger and smaller angles.

Key Terms

45° angle, 90° angle, 180° angle, angle, arc, degrees, endpoint, half, ray, right angle, square, straight angle, vertex

Additional Resources or Links

https://www.engageny.org/resource/grade-4-mathematics-module-4-topic-lesson-3

https://www.engageny.org/resource/grade-4-mathematics-module-4-topic-lesson-2

MA 4.3.1.h

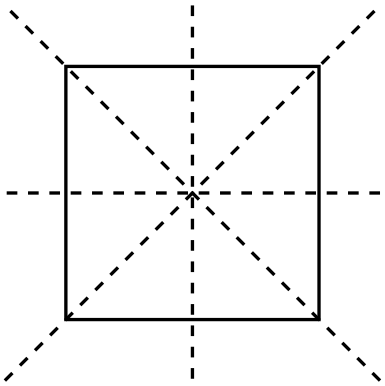
Recognize and draw lines of symmetry in two-dimensional shapes.

Extended: Identify a line of symmetry in a rectangle, square, or circle.

Scaffolding Activities for the Extended Indicator

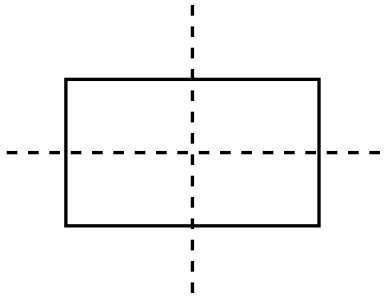
❑ **Identify lines of symmetry in folded paper rectangles, squares, and circles.**

- Fold a piece of square paper evenly in half. Explain that the fold line is a line of symmetry. A line of symmetry is a line that cuts a shape exactly in half. If folded along the line, both halves match exactly. Model the folding and matching of halves.
- Explain that squares have 4 lines of symmetry. Fold and identify each line of symmetry with 4 squares, each folded along a different line of symmetry. Demonstrate how the two halves match when folded together, thus representing a line of symmetry.



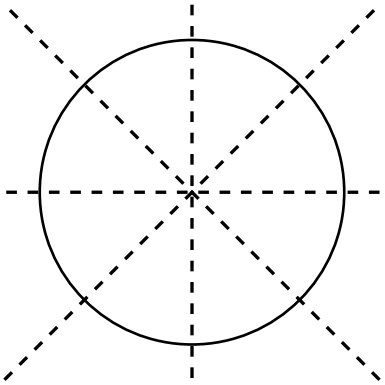
4 lines of symmetry

- Explain that rectangles have 2 lines of symmetry. Fold and identify each line of symmetry with 2 rectangles, each folded along a different line of symmetry. Demonstrate how the two halves match when folded together, thus representing a line of symmetry. Demonstrate a counterexample, by folding a rectangle diagonally. Show how the two halves do not match and explain that this is not a line of symmetry.



2 lines of symmetry

- Explain that circles have many lines of symmetry. Fold and identify several lines of symmetry with circles. Demonstrate how the two halves match when folded together, thus representing a line of symmetry.

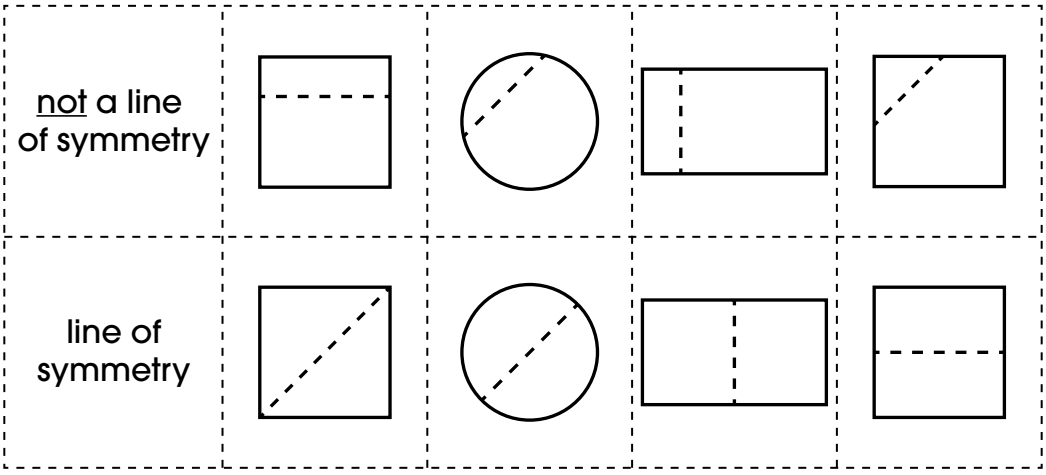


infinite lines of symmetry

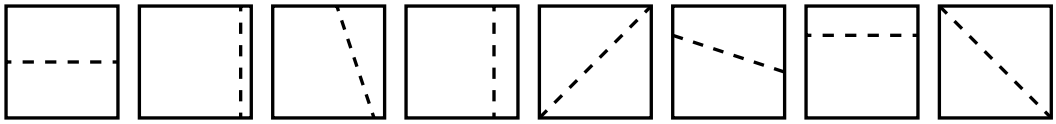
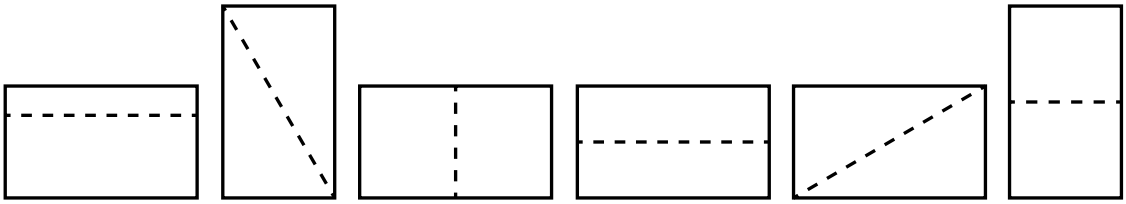
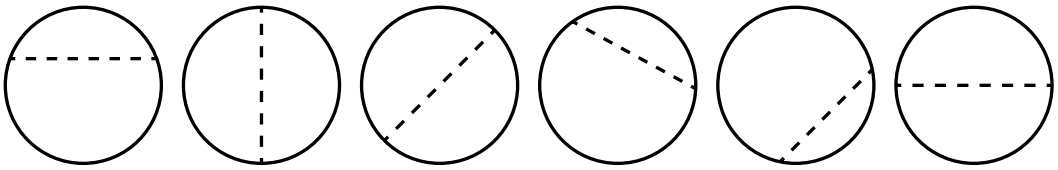
- Ask students to demonstrate their understanding by sorting folded paper squares, circles, and rectangles into two categories to identify folds along lines of symmetry and folds not along lines of symmetry.

❑ **Identify lines of symmetry drawn on rectangles, squares, and circles.**

- Explain how to identify whether a line drawn on a shape is a line of symmetry. Use a similar chart with shapes pre-sorted or ask students to help you sort similar shapes. Explain that the line drawn on the shapes is like the fold line. If the line divides the shape into two equal pieces (in half), then it is a line of symmetry. If the line does not divide the shape into halves, then it is not a line of symmetry.



- Ask students to identify all the shapes showing lines of symmetry in each row of the table as shown.

Squares	
Rectangles	
Circles	

Prerequisite Extended Indicators

MAE 3.3.1.c—Identify a line that separates a symmetric two-dimensional shape into halves.

MAE 3.3.1.b—Identify two-dimensional shapes, circles, triangles, rectangles, or squares from a collection of circles, rectangles, and squares.

Key Terms

circle, halves, line, rectangle, sort, square, symmetry

Additional Resources or Links

http://tasks.illustrativemathematics.org/content-standards/4/G/A/3

https://www.insidemathematics.org/sites/default/files/materials/quilt%20making.pdf

MA 4.3.3 Measurement

MA 4.3.3.a

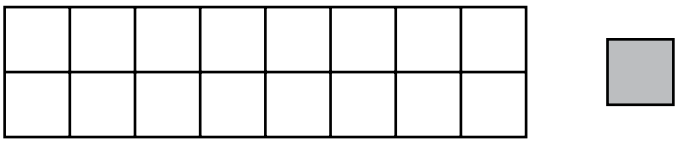
Apply perimeter and area formulas for rectangles.

Extended: Identify the area of a rectangle by counting unit squares.

Scaffolding Activities for the Extended Indicator

❑ **Identify the unit squares included in the area of a rectangle.**

- Use a rectangle marked with 1-unit grid lines to show area as the count of unit squares that cover the rectangle. For example, using the rectangle and tiles, show that tiles can be placed to cover the rectangle. Describe the tile as a unit square that measures 1 unit on each side.

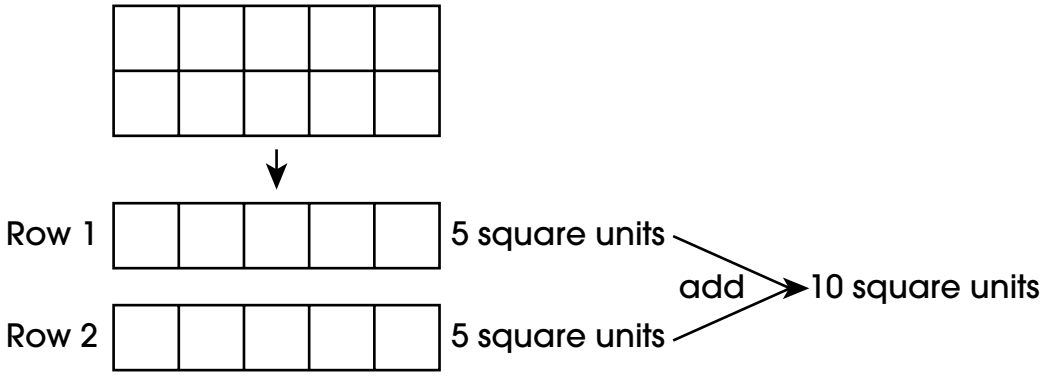


Demonstrate that 16 tiles cover the rectangle and that each tile corresponds to one of the unit squares marked on the rectangle. Reinforce the idea that the area of the rectangle is 16 square units.

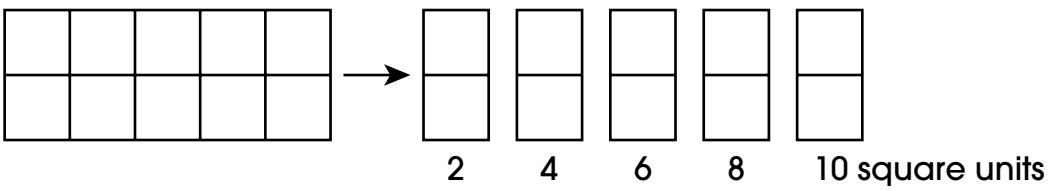
- Ask students to identify a unit square within a rectangle shown with unit squares inside.

❑ **Find the area of a rectangle by counting whole numbers of unit squares.**

- Use a rectangle set on a grid to teach counting strategies for calculating area, such as grouping row and column counts. For example, given a 2-by-5 rectangle marked with unit squares, group rows of unit squares to determine the area of the rectangle.



Alternately, use groupings of the 2 columns of unit squares to determine the area of the rectangle.



- Ask students to use grouping strategies to determine the area of a rectangle marked with unit squares.

Prerequisite Extended Indicators

MAE 3.3.3.g—Find the area of a square by counting whole number unit squares.

MAE 3.1.1.a—Read, write, and demonstrate whole numbers up to 20 that are equivalent representations including visual models, standard form, and word form.

Key Terms

area, column, grouping, rectangle, row, unit square

Additional Resources or Links

https://www.engageny.org/resource/grade-3-mathematics-module-4-topic-lesson-3

https://www.engageny.org/resource/grade-2-mathematics-module-6-topic-lesson-2

MA 4.3.3.c

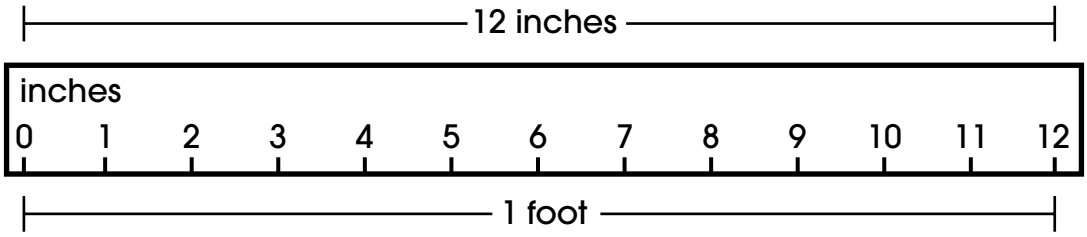
Generate simple conversions from a larger unit to a smaller unit within the customary and metric systems of measurement.

Extended: Identify the number of inches in one or two feet using a model of a ruler.

Scaffolding Activities for the Extended Indicator

❑ **Identify the number of inches in one foot using a model of a ruler.**

- Use a ruler to demonstrate counting each inch on the ruler to show that it is 12 inches long. Explain that this length is equivalent to 1 foot.

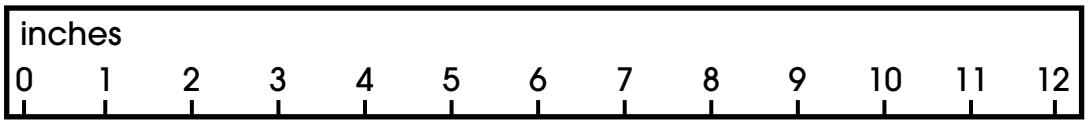


- Ask students to select the number of inches in 1 foot. For example, present three choices as shown and ask, “What is the length of 1 foot in inches?”

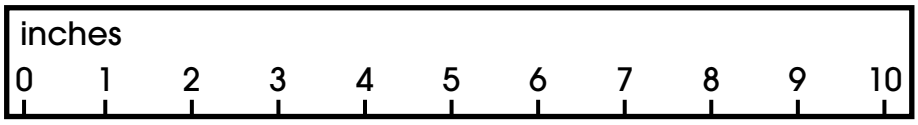
A. 9 inches B. 10 inches C. 12 inches

- Ask students to select a ruler that shows a length of 1 foot. For example, present the following figures and ask, “Which ruler shows a length of 1 foot?”

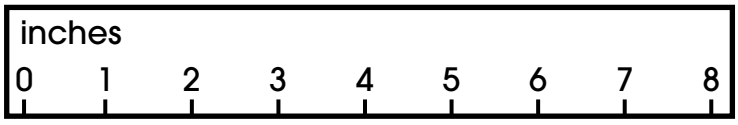
A.



B.

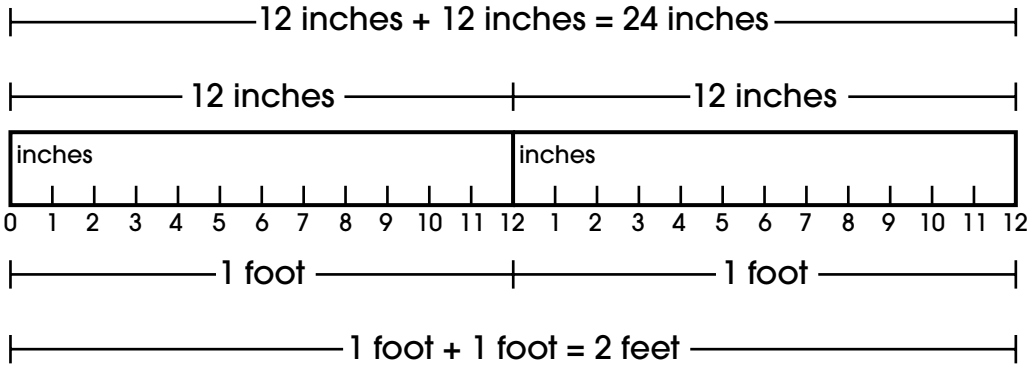


C.



❑ **Identify the number of inches in two feet using a model of a ruler.**

- Use a ruler to show that 1 foot is equivalent to 12 inches and that putting two 1-foot rulers together makes 24 inches. To demonstrate, count inches from 1 to 12 for the first foot and then continue counting from 13 to 24 for the second foot.



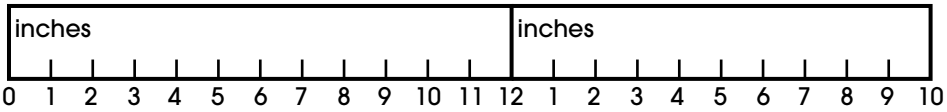
- Ask students to select the number of inches in 2 feet. For example, present three choices as shown and ask, “What is the length of 2 feet in inches?”

A. 24 inches B. 20 inches C. 12 inches

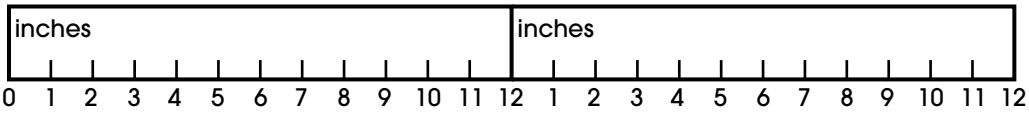
- Ask students to select a pair of rulers that show a length of 2 feet. For example, present the following figures and ask, “Which rulers show a length of 2 feet?”

A.

B.



C.



Prerequisite Extended Indicators

MAE 3.3.3.e—Measure length to the nearest inch using a model of an object.

MAE 3.1.1.a—Read, write, and demonstrate whole numbers up to 20 that are equivalent representations including visual models, standard form, and word form.

Key Terms

foot, inch, ruler

Additional Resources or Links

http://nlvm.usu.edu/en/nav/frames_asid_272_g_2_t_4.html?open=instructions&from=search.html?qt=ffeet

(Note: Java required for website. Most recent version recommended, but not needed.)

https://www.engageny.org/resource/grade-2-mathematics-module-7-topic-c-lesson-15

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Mathematics—Grade 4
MA 4.4 Data

MA 4.4.1 Representations

MA 4.4.1.a

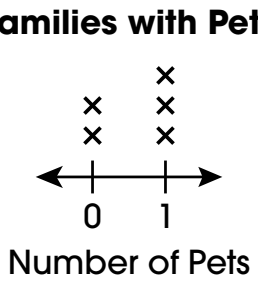
Represent data using line plots where the horizontal scale is marked off in appropriate units (e.g., whole numbers, halves, quarters, or eighths).

Extended: Interpret information in a line plot using two data points.

Scaffolding Activities for the Extended Indicator

❑ **Identify components of a line plot.**

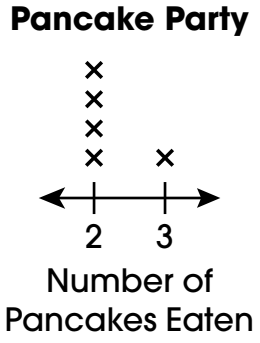
- Present a line plot as shown and explain that a line plot is a way to organize data using a number line. A line plot is a graph that shows how many (the frequency) by using dots or x's above the numbers on a number line. Identify the different components of the line plot, including the number line, the title, the x's showing frequency, and the label. Repeat this for a variety of line plots.



- Ask students to identify the components of a line plot (e.g., title, number line, label, frequency).

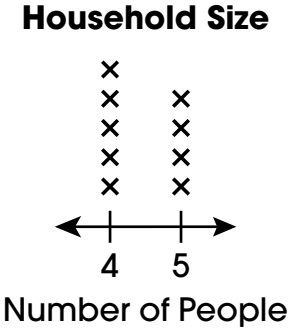
❑ **Interpret information in a line plot using two data points.**

- Present the line plot shown and explain that the line plot is about a pancake party. The numbers below the line plot show how many pancakes were eaten, and the x's represent how many people ate that number of pancakes. Model interpreting the x's on the line plot. This line plot shows that four people each ate two pancakes and one person ate three pancakes. More people ate two pancakes than ate three pancakes.

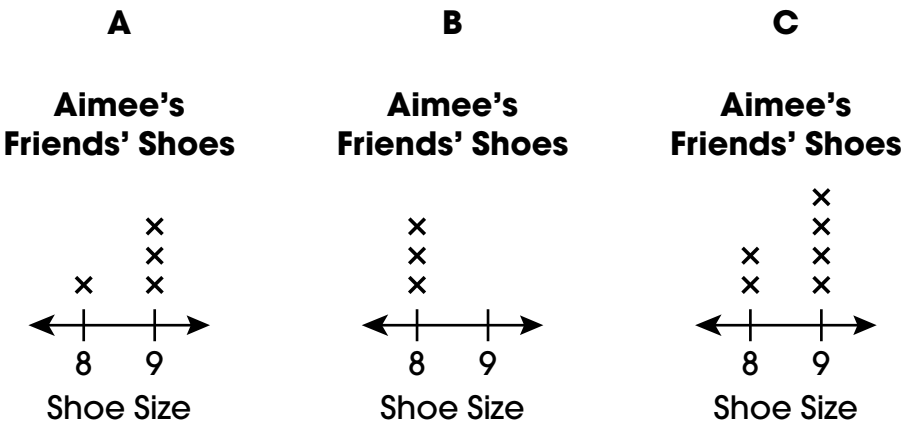


Continue to model interpreting information on a variety of line plots with a focus on identifying the frequency and comparing the two data points.

- Ask students to interpret information on a line plot. For example, present the line plot shown and ask questions such as "How many families have a household size of four?" or "Do more families have a household size of four or five?"



- Ask students to compare information on multiple line plots. For example, present the line plots shown and ask questions such as "Which line plot shows two people with a shoe size of eight?" or "Which line plot shows more people with a shoe size of eight?"



Prerequisite Extended Indicators

MAE 3.1.1.b—Compare and order whole numbers, 1–20.

MAE 3.1.1.d—Represent halves and wholes on a number line.

Key Terms

data, frequency, label, line plot, number line, title

Additional Resources or Links

https://www.mathlearningcenter.org/sites/default/files/pdfs/SecB2SUP-D2_MeasLengCust-201304.pdf

https://www.mathlearningcenter.org/apps/number-line

MA 4.4.2 Analysis and Applications

MA 4.4.2.a

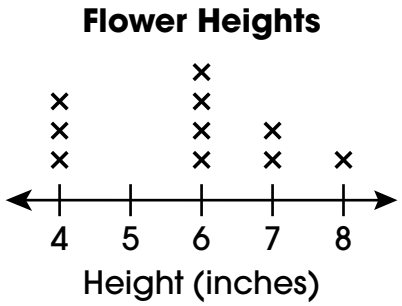
Solve problems involving addition or subtraction of fractions using information presented in line plots.

Extended: Solve a problem with addition or subtraction of whole numbers using information from a line plot.

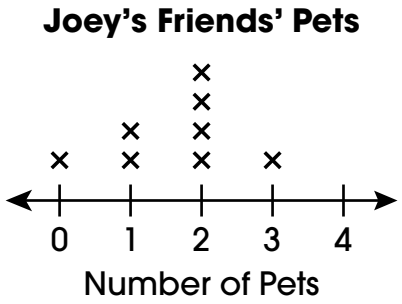
Scaffolding Activities for the Extended Indicator

❑ **Interpret information presented in a line plot.**

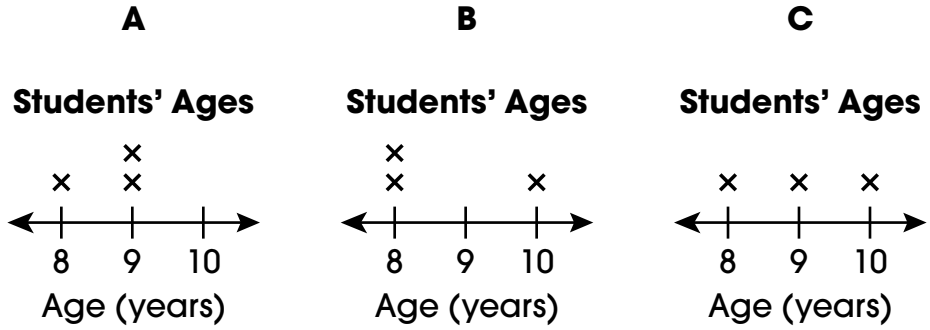
- Present a line plot as shown. Indicate the title, label, and values shown on the line plot. Explain that the x's represent the frequency of each value in the line plot. Provide explanations or descriptions to demonstrate how to interpret the information found on the line plot. Indicate that the three x's above the 4 mean that three flowers are four inches tall. Then indicate that the most common flower height is 6 inches and that the heights of ten flowers are recorded on this line plot.



- Ask students to interpret a line plot. For example, present the line plot shown and ask students to analyze the line plot in terms of how many friends have each number of pets, which number of pets is the most/least common, and how many of Joey's friends are represented in the line plot.

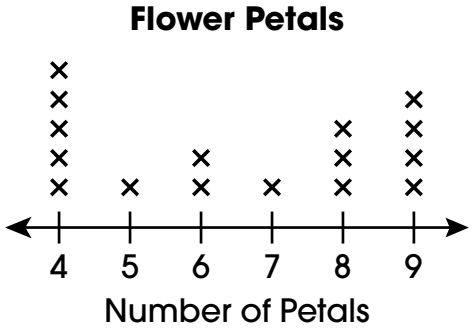


- Ask students to interpret information on multiple line plots. For example, present the line plots shown and ask questions such as “Which line plot shows more students that are 9 years old than 8 years old?” and “Which line plot shows one student of each age?”



❑ **Solve a problem with addition or subtraction of whole numbers using information from a line plot.**

- Present a line plot as shown. Indicate the title, label, and values shown on the line plot. Explain that a group of students counted the number of petals on flowers and recorded the results on the line plot. Demonstrate using information from the line plot to solve addition and subtraction problems. “How many more flowers have 4 petals than have 9 petals? How many total flowers have 8 petals or 9 petals?”



- Ask students to record information from the line plot and then interpret the information to solve a problem. Use the line plot referenced above and present a template as shown or workspace for students to record answers to a series of questions. “How many flowers have 4 petals? How many flowers have 5 petals? How many flowers have 4 or 5 petals?” Students need to complete the addition problem to answer the final question.

  _____ flowers with 4 petals

  _____ flowers with 5 petals

  How many flowers have 4 or 5 petals?

  Repeat this process for a subtraction problem. “How many flowers have 8 petals? How many flowers have 7 petals? How many more flowers have 8 petals than have 7 petals?”

- Ask students to solve a problem with addition or subtraction using information from a line plot.

Prerequisite Extended Indicators

MAE 4.4.1.a—Interpret information in a line plot using two data points.

MAE 3.1.2.a—Add and subtract, through 20 without regrouping.

Key Terms

data, frequency, label, line plot, number line, title

Additional Resources or Links

http://tasks.illustrativemathematics.org/content-standards/2/MD/D/10/tasks/506

https://www.mathlearningcenter.org/sites/default/files/pdfs/SecB2SUP-D2_MeasLengCust-201304.pdf

(line plots on pages 41 – 66)

https://www.engageny.org/resource/grade-2-mathematics-module-7-topic-f-lesson-25/file/73291

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Alternate Mathematics Instructional Supports for NSCAS Mathematics Extended Indicators Grade 4