Write the numeral below in **standard** form and **expanded** form.

three hundred six thousand, two hundred forty-five.

✔ 4NS.1 Read and write whole numbers up to 1,000,000. Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to 1,000,000.

http://www.ixl.com/math/grade-4/word-names-for-numbers

Compare: 304,625 _____ 340,652

✔ 4NS.2 Compare two whole numbers up to 1,000,000 using >, =, and < symbols.

http://www.ixl.com/math/grade-4/compare-numbers-up-to-billions
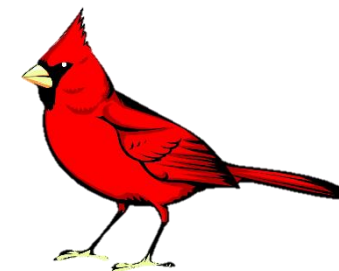
a)   Write 8 as a fraction such that the numerator is 8.

b) Which numbers below are equivalent to 8?

$$\frac{16}{2} \qquad \frac{24}{8} \qquad \frac{8}{8} \qquad \frac{24}{3} \qquad \frac{40}{5}$$

c) Draw a picture to represent 3 ¾. Then write it as an improper fraction.

✔ 4NS.3 Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. Name and write mixed numbers using objects or pictures. Name and write mixed numbers as improper fractions using objects or pictures.
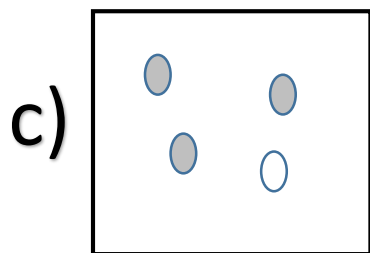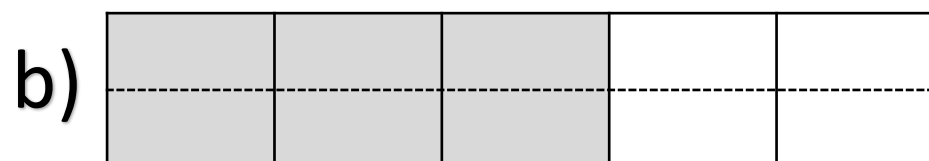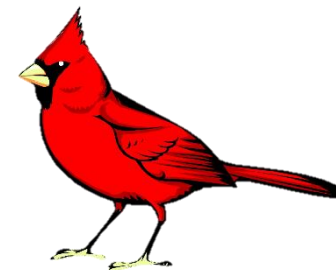
a) Which model shows that 3/4 is equivalent to 6/8?

a)

b)

c)

b) Name four fractions that are equivalent to 2/5.

4NS.4 Explain why a fraction, a/b, is equivalent to a fraction, (n × a)/(n × b), by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use the principle to recognize and generate equivalent fractions. [In grade 4, limit denominators of fractions to 2, 3, 4, 5, 6, 8, 10, 25, 100.

https://www.illustrativemathematics.org/illustrations/743

Use <, >, = to compare each pair of fractions.
Explain how you determined your answers.

3/4 _____ 5/8

2/5 _____ 4/10

2/3 _____ 12/25

4NS.5 Compare two fractions with different numerators and different denominators (e.g., by creating common denominators or numerators, or by comparing to a benchmark, such as 0, 1/2, and 1). Recognize comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions (e.g., by using a visual fraction model.)

https://www.illustrati vemathematics.org/illustrations/812

Complete the table to show each number as a fraction and decimal.

Number	Fraction	Decimal
Six tenths		
Five hundredths		
Thirty-two hundredths		

✔4NS.6 Write tenths and hundredths in decimal and fraction notations. Use words, models, standard form and expanded form to represent decimal numbers to hundredths. Know the fraction and decimal equivalents for halves and fourths (e.g., 1/2 = 0.5 = 0.50, 7/4 = 1 3/4 = 1.75).

http://www.ixl.com/math/grade-4/convert-decimals-to-fractions-and-mixed-numbers
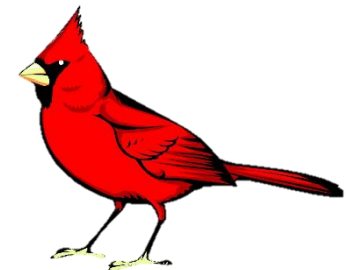
Use <, =, > to compare each pair of decimals.
Explain how you determined your answers.

0.1 _____ 0.7

0.1 _____ 0.07

0.3 _____ 0.30

0.5 _____ 0.05

0.25 _____ 0.31

1.2 _____ 2.1

2.2 _____2.1

4NS.7 Compare two decimals to hundredths by reasoning about their size based on the same whole. Record the results of comparisons with the symbols >, =, or <.
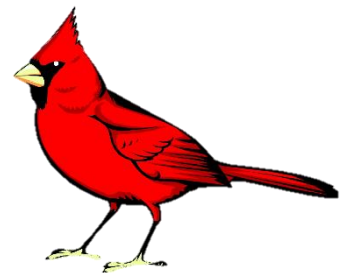
http://www.ixl.com/math/grade-4/comparedecimal-numbers
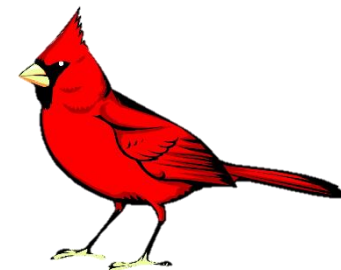
a) List all of the factor pairs of 72.

b) Is 42 a multiple of 3?

c) Explain how you know.

4NS.8 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number.

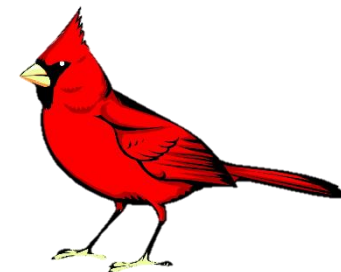http://www.ixl.com/math/grade-4/choose-the-multiples-of-a-given-number-up-to-12

a) Round 457,208 to each place value below.

- hundred-thousand
- ten-thousand
- thousand
- hundred
- ten

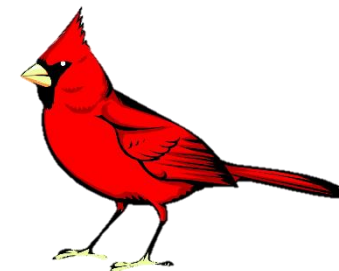4NS.9 Use place value understanding to round multi-digit whole numbers to any given place value.

a) Evaluate each expression.

- **3,685 + 45,079**

- **4,006 – 1,248**

- **85,137 + 9,009**

- **705,492 - 36,185**

4C.1 Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.

http://www.ixl.com/math/grade-4/subtract-numbers-up-to-millions

a) Evaluate each expression.

- **2,368 x 8**
- **36 x 24**

4C.2 Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning.

http://www.ixl.com/math/grade-4/properties-of-multiplication
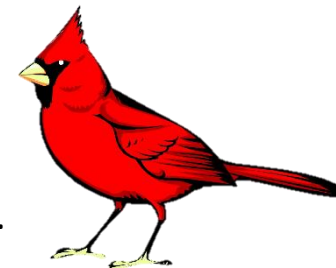
a) Evaluate each expression.

- **4,319 ÷ 7**
- **2,772 ÷ 8**

4C.3 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning.

http://www.ixl.com/math/grade-4/properties-of-division
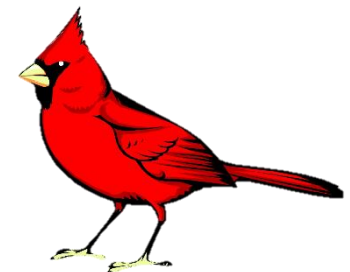
a) Evaluate each expression.

- **16 x 6**
- **23 x 4**
- **5 x 13**
- **39 x 2**
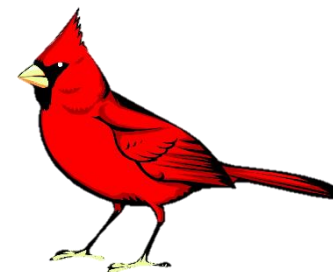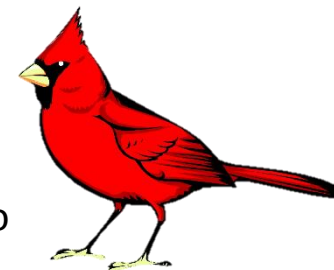
a) The fraction 5/6 can be written as 1/6 + 4/6. Write 5/6 as a sum of two or more fractions in three different ways.

b) 5/8 + 2/8 =

c) 4/10 - 3/10 =

4C.5 Add and subtract fractions with common denominators. Decompose a fraction into a sum of fractions with common denominators. Understand addition and subtraction of fractions as combining and separating parts referring to the same whole.

http://www.ixl.com/math/grade-4/add-and-subtract-fractions-with-like-denominators

a)   5 ¾ + 2 ¾ =

b)   6 ⅔ - 4 ⅓ =

4C.6 Add and subtract mixed numbers with common denominators (e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction).

https://www.illustrativemathematics.org/illustrations/874
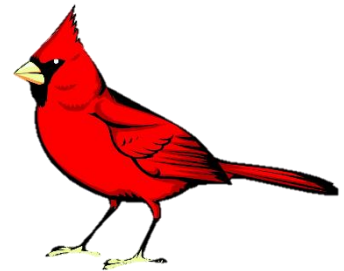
a)   One way to multiply 6 x 2 x 5 is to first multiply 6 and 2, then multiply that value by 5. Describe another way to multiply these three numbers. What is ?

b) Evaluate: 7(3+2)

c) Evaluate: 5(8-6)

4C.7 Show how the order in which two numbers are multiplied (**commutative property**) and how numbers are grouped in multiplication (**associative property**) will not change the product. Use these properties to show that numbers can by multiplied in any order. Understand and use the distributive property.
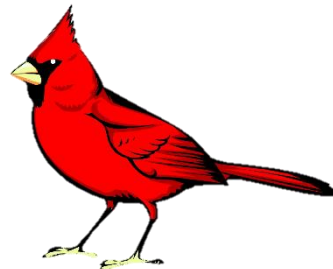
a)   Milagro has 52,500 baseball cards. Julie has 109,078 baseball cards. Carl has 1,048 baseball cards. How many more cards does Julie have than Milagro and Carl combined?

b)   Barry and Tina participated in a reading contest last year. They read a combined total of 12,082 pages. Barry read 5,916 pages. How many pages did Tina read?

4AT.1 Solve real-world problems involving addition and subtraction of multi-digit whole numbers (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).
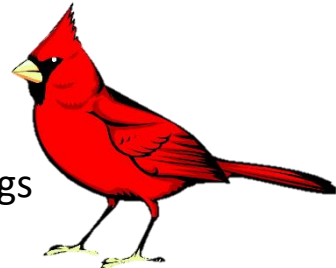
a) Jasmine has 7 bags with 6 marbles in each bag. She says that the only way to determine the total number of marbles is to do 6+6+6+6+6+6+6. Is Jasmine correct or can you describe another way without using addition to determine the total number of marbles? What is the total number of marbles?

4AT.2 Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve real-world and other mathematical problems

http://www.ixl.com/math/grade-4/properties-of-division
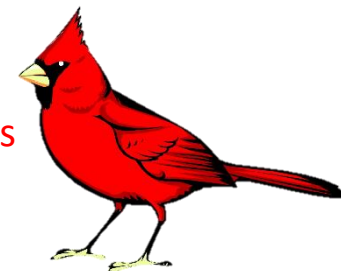
a) Write an equation that describes 4 times as many as 8.

✔ **4AT.3** Interpret a multiplication equation as a comparison (e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7, and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.

a) Sam has $7. Amy has 4 times as much as Sam. How much money does Amy have?

b) Teah has $72 and that is 8 times as much as Ray. How much money does Ray have?

c) Madison has $88 and Tyler has $22. How many times more does Madison have as compared to Tyler?

4AT.4 Solve real-world problems with whole numbers involving multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem), distinguishing multiplicative comparison from additive comparison. [In grade 4, division problems should not include a remainder.]

https://www.illustrativemathematics.org/illustrations/263
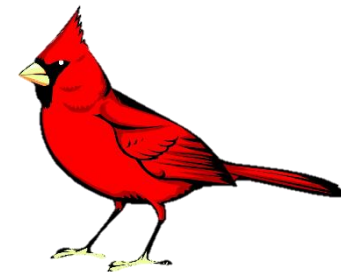
a) Josie and Sabrina shared a pizza. Josie ate 3/6 of the pizza and Sabrina ate 2/6 of the pizza. How much of the pizza did they eat altogether?

b) Kim has 3 3/8 pies left over from a party. After giving some to her dad, she has 1 1/8 pies left. How much pie did Kim give to her dad?

4AT.5 Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem).

http://www.ixl.com/math/grade-4/add-and-subtract-fractions-with-like-denominators-word-problems
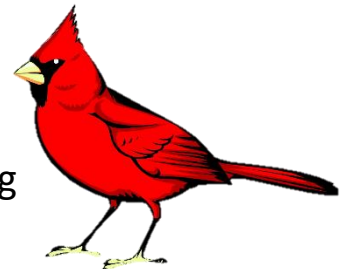
a) Erin makes a picture in art class. For every square she uses in her picture, she uses 5 triangles. The equation **T = 5s** represents this relationship where T represents the number of triangles and s represents the number of squares. **How many triangles does Erin use if she uses 9 squares, 10 squares, 11 squares?**

b) Use the equation **y = 3x - 2** to determine the values of y for the given values of x.

x	y
1	
2	
3	
4	
5	

4AT.6 Understand that an equation, such as y = 3x + 5, is a rule to describe a relationship between two variables and can be used to find a second number when a first number is given. Generate a number pattern that follows a given rule.
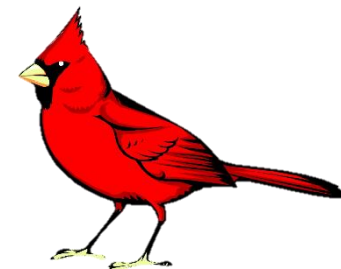
http://www.ixl.com/math/grade-4/function-tables
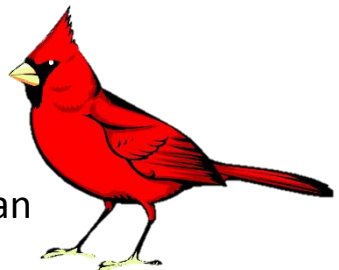
Draw a parallelogram, rhombus, and trapezoid and describe how they are similar and different.

✔ 4G.1 Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).
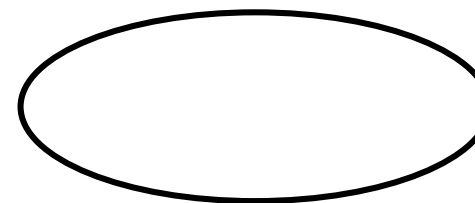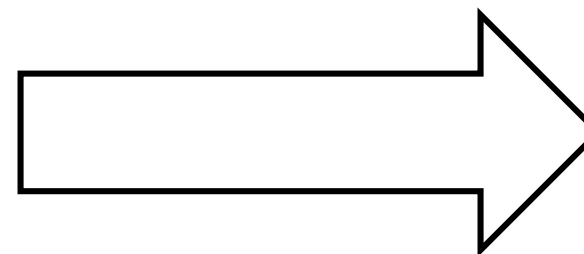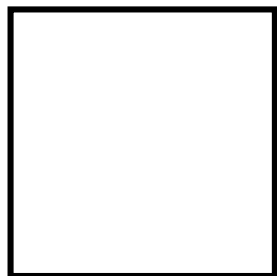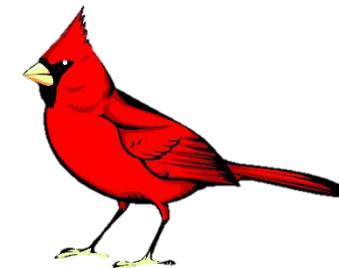
http://www.ixl.com/math/grade-4/identify-planar-and-solid-figures

Draw as many lines of symmetry as possible for each of the given figures.

✔ 4G.2 Recognize and draw lines of symmetry in two-dimensional figures. Identify figures that have lines of symmetry.
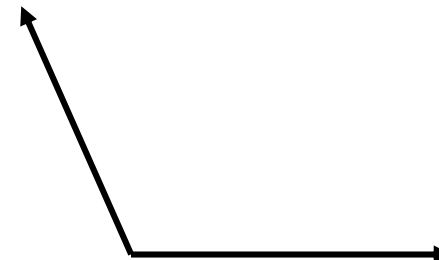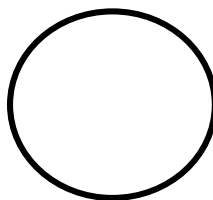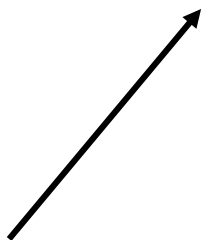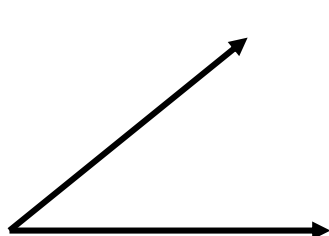
https://www.illustrativemathematics.org/illustrations/676

Circle each picture that represents an angle.

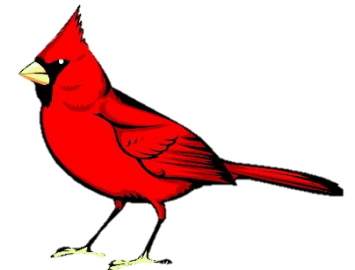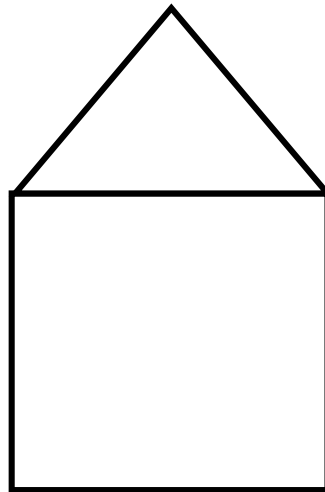4G.3 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint.

http://www.ixl.com/math/grade-4/estimate-angle-measurements

In the picture below, identify all of the pairs of parallel and perpendicular lines, and all of the right and acute angles.

4G.4 Identify, describe, and draw rays, angles (right, acute, obtuse), and perpendicular and parallel lines using appropriate tools (e.g., ruler, straightedge and technology). Identify these in two-dimensional figures.
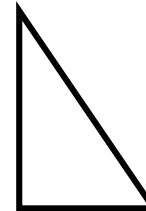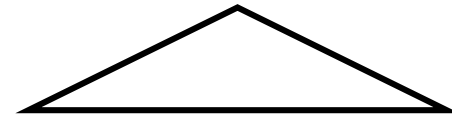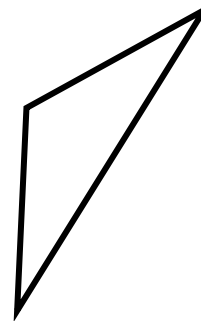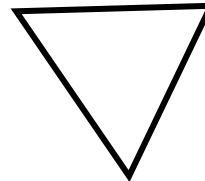
Classify the triangles into 3 groups; triangles with a right angle, triangles with an obtuse angle, and triangles with only acute angles.
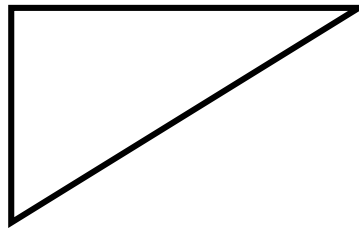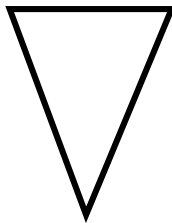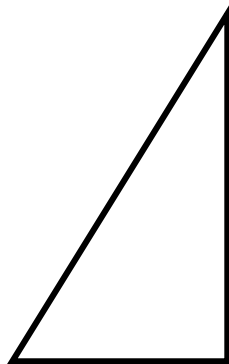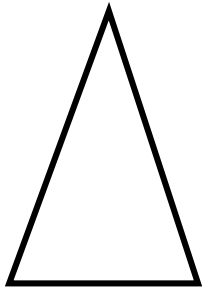
4G.5 Classify triangles and quadrilaterals based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles (right, acute, obtuse).

http://www.ixl.com/math/grade-4/which-2-dimensional-shape-is-being-described

Classify the quadrilaterals into 2 groups:
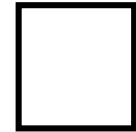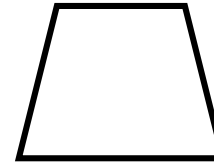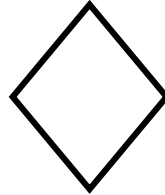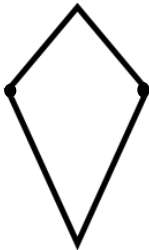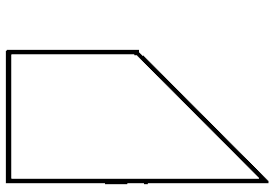
Parallelograms | Not Parallelograms

4G.5 Classify triangles and quadrilaterals based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles (right, acute, obtuse).

http://www.ixl.com/math/grade-4/which-2-dimensional-shape-is-being-described

Use a ruler to measure the line segment to the nearest quarter-inch, eighth-inch, and millimeter.

_____

✔ 4M.1 Measure length to the nearest quarter-inch, eighth-inch, and millimeter.

http://www.ck12.org/measurement/Length-Measurements-to-a-Fraction-of-an-Inch

Use a ruler to measure the line segment to the nearest quarter-inch, eighth-inch, and millimeter.

✔ 4M.1 Measure length to the nearest quarter-inch, eighth-inch, and millimeter.

http://www.ck12.org/measurement/Length-Measurements-to-a-Fraction-of-an-Inch

Complete the tables to show the relationship between the units.

hours	minutes
1	
2	
3	
4	
5	

meters	centimeters
1	
2	
3	
4	
5	

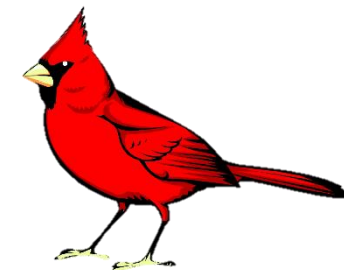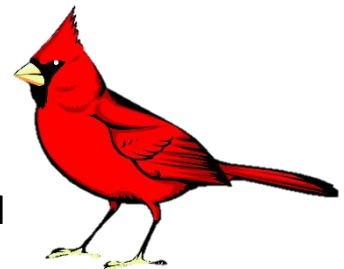✔**4M.2** Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table.

http://www.ixl.com/math/grade-4/compare-and-convert-customary-units
http://www.ixl.com/math/grade-4/compare-and-convert-metric-units

Indiana Academic Standards for Mathematics
Fourth Grade

Complete the tables to show the relationship between the units.

feet	inches
1	
2	
3	
4	
5	

kilogram	grams
1	
2	
3	
4	
5	

✔ **4M.2** Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table.

http://www.ixl.com/math/grade-4/compare-and-convert-customary-units
http://www.ixl.com/math/grade-4/compare-and-convert-metric-units

Indiana Academic Standards for Mathematics
Fourth Grade

Complete the tables to show the relationship between the units.

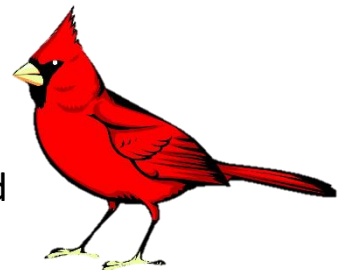| pounds (lb)	ounces (oz)
1	
2	
3	
4	
5	

minutes	seconds
1	
2	
3	
4	
5	

4M.2 Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table.

http://www.ixl.com/math/grade-4/compare-and-convert-customary-units
http://www.ixl.com/math/grade-4/compare-and-convert-metric-units

Complete the tables to show the relationship between the units.

gallons	quarts
1	
2	
3	
4	
5	

liters	milliliters
1	
2	
3	
4	
5	

✔ **4M.2** Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table.

http://www.ixl.com/math/grade-4/compare-and-convert-customary-units
http://www.ixl.com/math/grade-4/compare-and-convert-metric-units
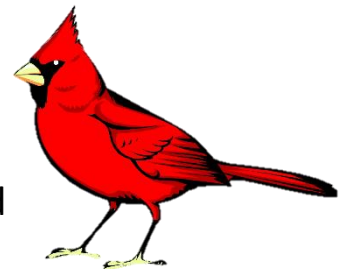
Ted played outside for 3 ½ hours. Kelly played outside for 1 ½ hours.

- How many hours did they play outside altogether?

- How many more minutes did Ted play outside than Kelly?

4M.3 Use the four operations (addition, subtraction, multiplication and division) to solve real-world problems involving distances, intervals of time, volumes, masses of objects, and money. Include addition and subtraction problems involving simple fractions and problems that require expressing measurements given in a larger unit in terms of a smaller unit.

http://www.ixl.com/math/grade-4/add-and-subtract-mixed-time-units

http://www.ixl.com/math/grade-4/price-lists-with-multiplication

Tim had $20.52 to spend. Kelly saved $15.95 to purchase a new game.

- How much money do they have altogether?

- How much more money did Tim have than Kelly?

http://www.ixl.com/math/grade-4/add-and-subtract-mixed-time-units

http://www.ixl.com/math/grade-4/price-lists-with-multiplication

What is the **area** and **perimeter** of the figure below?

22 ft.

7 ft.

16 ft.

12 ft.

http://www.ixl.com/math/grade-4/area-of-complex-figures-with-all-right-angles

What is the **area** and **perimeter** of the figure below?

6 cm

7 cm

3 cm

12 cm
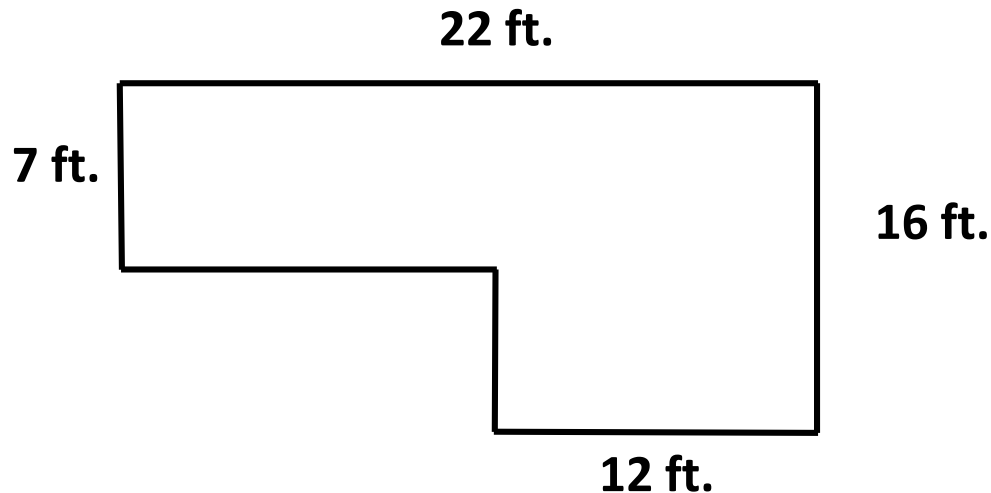
4M.4 Apply the area and perimeter formulas for rectangles to solve real-world problems and other mathematical problems. Recognize area as additive and find the area of complex shapes composed of rectangles by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts; apply this technique to solve real-world problems and other mathematical problems involving shapes.
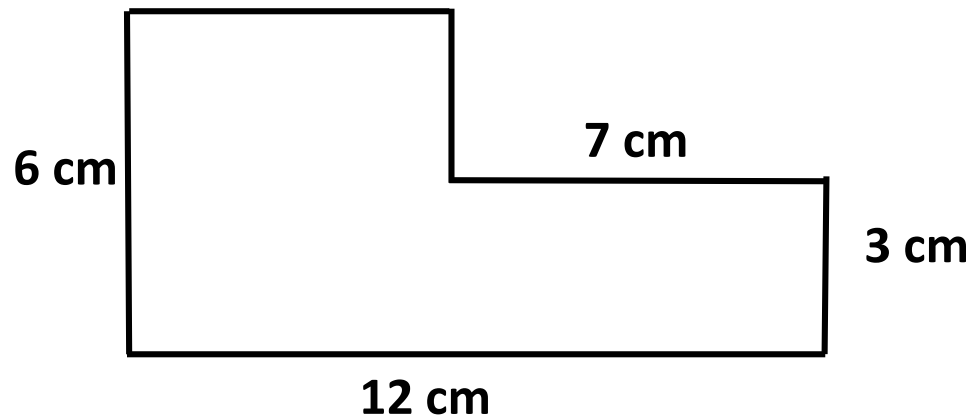
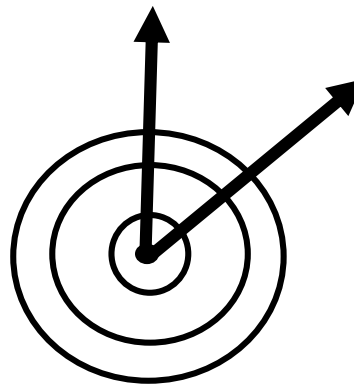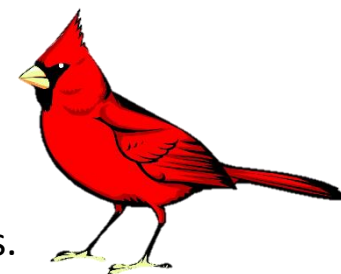http://www.ixl.com/math/grade-4/area-of-complex-figures-with-all-right-angles

The diagram below may help students understand that an angle measurement is not related to area since the area between the 2 rays is different for the 3 circles yet the angle measure is the same.

Before students begin measuring angles with protractors, they need to have some experiences with benchmark angles. They transfer their understanding that a 360º rotation about a point makes a complete circle to recognize and sketch angles that measure approximately 90º and 180º. They extend this understanding and recognize and sketch angles that measure approximately 45º and 30º. They use appropriate terminology (**acute, right, and obtuse**) to describe angles and rays (perpendicular).

a) Use a protractor to determine the measure of angles.
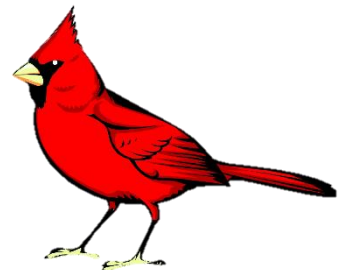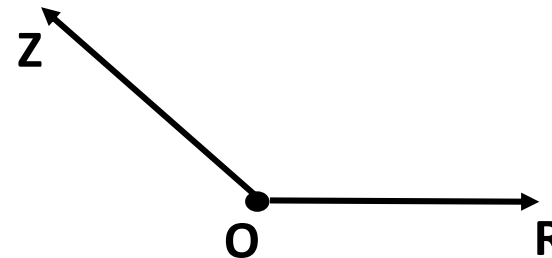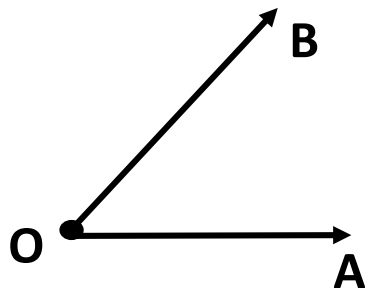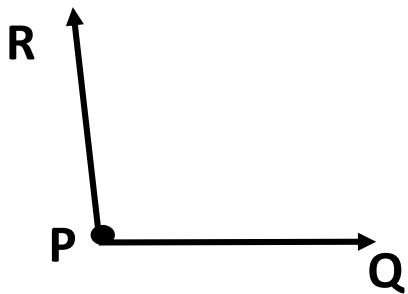
4M.6 Measure angles in whole-number degrees using appropriate tools. Sketch angles of specified measure.

Activity: Students can formulate a statistical question of interest and conduct an observation, survey, or experiment. They can collect, organize, and display their data, and make observations based on their data display.

(**Examples**: Conduct a survey in class about favorite color, food, etc.; observe and tally the different colors of shirts classmates wear to school on a given day.) Make a frequency table, line plot, or bar graph to display data.

4DA.1 Formulate questions that can be addressed with data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, and bar graphs.

http://www.ixl.com/math/grade-4/make-predictions
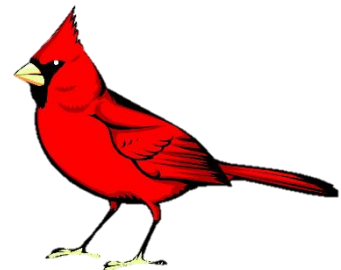
a) Activity: Students can measure the length of their right hand (in a standardized manner) to the nearest quarter-inch. Then, compile the data and make a line plot to display and analyze the data.

_____

✔**4DA.2** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using data displayed in line plots.
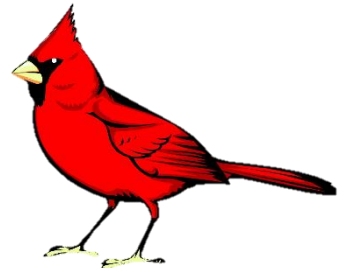
a) **Ten students measured their pencils to the nearest eighth-inch. They recorded their results as shown in the line plot below.**

```
                    X                   X
                    X                   X           X
         X          X          X        X           X
    _____
      3 4/8        4        4 2/8     5 1/8      5 5/8
```

- What is the difference in length between the longest and shortest pencil?

- If you were to line up all 10 pencils, what would the total length be?

✔**4DA.2** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using data displayed in line plots.
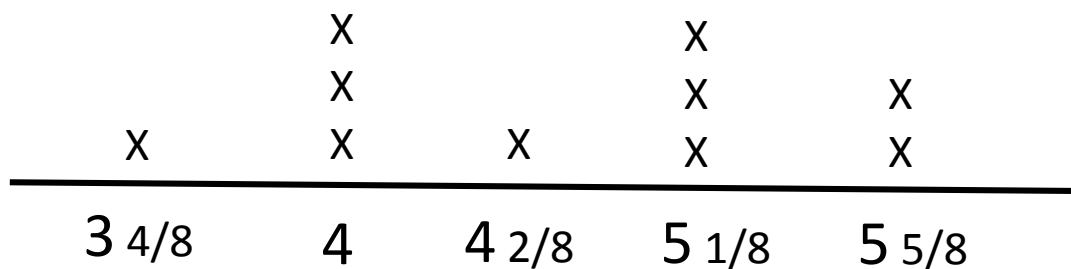
http://www.ixl.com/math/grade-4/create-line-plots

a) Ten students measured their plants height to the nearest quarter-inch. They recorded their results as shown in the line plot below.

```
                               X
                    X          X
                    X          X
          X         X          X          X
          X         X     X    X          X
         ────────────────────────────────────
          7 ¼      8 ½    9    9 ¾       10 ¼
```

- What is the difference in length between the tallest and shortest plant?

- What size plant was grown most frequently?

✔ **4DA.2** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using data displayed in line plots.
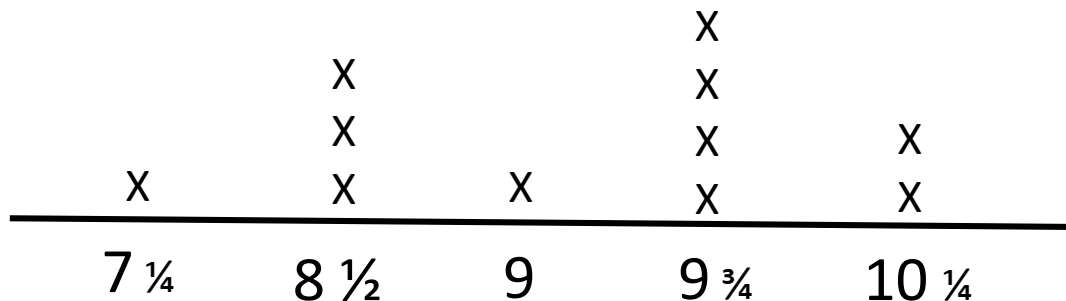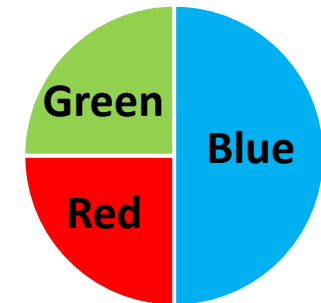
http://www.ixl.com/math/grade-4/create-line-plots

Jim asked the students in his class to choose their favorite color out of blue, red, and green. He represented this data in a circle graph as shown below.

Favorite Color

Based on the graph, which statements are **true**?

- About ¼ of the class chose blue as their favorite color.
- About ½ of the class chose blue as their favorite color.
- About ½ of the class chose green or red as their favorite color.
- The color chosen most was blue.
- Red and green were chosen the same amount.

4DA.3 Interpret data displayed in a circle graph.

http://www.ck12.org/statistics/Interpretation-of-Circle-Graphs/lesson/Interpretation-of-Circle-Graphs-Grade-7/r9/