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Table of Contents with Standards

Number Sense and Operations (NSO) 10

Rewrite numbers in equivalent forms

MA.7.NSO.1.111

Know and apply the Laws of Exponents to evaluate numerical expressions and generate equivalent numerical expression, limited to whole-number exponents and rational number bases

MA.7.NSO.1.217

Rewrite rational numbers in different by equivalent forms including fractions, mixed numbers, repeating decimals and percentages to solve mathematical and real-world problems.

Add, subtract, multiply and divide rational numbers

MA.7.NSO.2.121

Solve mathematical problems using multi-step order of operations with rational numbers including grouping symbols, whole number exponents and absolute value.

MA.7.NSO.2.226

Add, subtract, multiply and divide rational numbers with procedural fluency

MA.7.NSO.2.331

Solve real world problems involving any of the four operations with rational numbers

Algebraic Reasoning (AR) 38

Rewrite algebraic expressions in equivalent forms.

MA.7.AR.1.139

Apply properties of operations to add and subtract linear expressions with rational coefficients.



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MA.7.AR.1.247

Determine whether two linear expressions are equivalent.

Write and solve equations and inequalities in one variable

MA.7.AR.2.153

Write and solve one-step inequalities in one variable within a mathematical context and represent solutions algebraically or graphically.

MA.7.AR.2.259

Write and solve two-step equations in one variable within a mathematical or real-world context, where all terms are rational numbers.

Use percentages and proportional reasoning to solve problems.

MA.7.AR.3.166

Apply previous understandings of percentages and ratios to solve multi-step real-world percent problems.

MA.7.AR.3.275

Apply previous understanding of ratios to solve real-world problems involving proportions.

MA.7.AR.3.380

Solve mathematical and real-world problems involving the conversation of units across different measurement systems

Analyze and represent two-variable proportional relationships

MA.7.AR.4.185

Determine whether two quantities have a proportional relationship by examining a table, graph or written description.

MA.7.AR.4.291

Determine the constant of proportionality within a mathematical or real-world context given a table, graph or written description of a proportional relationship



MA.7.AR.4.396

Given a mathematical or real-world context, graph proportional relationships from a table, equation or a written description.

MA.7.AR.4.4 102

Given any representation of a proportional relationship, translate the representation to a written description, table or equation.

MA.7.AR.4.5 107

Solve real-world problems involving proportional relationships.

Geometric Reasoning (GR) 113

Solve problems involving two-dimensional figures, including circles

MA.7.GR.1.1 114

Apply formulas to find the areas of trapezoids, parallelograms and rhombi.

MA.7.GR.1.2 121

Solve mathematical or real-world problems involving the area of polygons or composite figures by decomposing them into triangles or quadrilaterals.

MA.7.GR.1.3 127

Explore the proportional relationship between circumferences and diameters of circles. Apply a formula for the circumference of a circle to solve mathematical and real-world problems.

MA.7.GR.1.4 132

Explore and apply a formula to find the area of a circle to solve mathematical and real-world problems

MA.7.GR.1.5 137

Solve mathematical and real-world problems involving dimensions and areas of geometric figures, including scale drawings and scale factors.



Solve problems involving three-dimensional figures, including right circular cylinders

MA.7.GR.2.1 143

Given a mathematical or real-world context, find the surface area of a right circular cylinder using the figure’s net.

MA.7.GR.2.2 149

Solve real-world problems involving surface area of right circular cylinders.

MA.7.GR.2.3 154

Solve mathematical and real-world problems involving volume of right circular cylinders

Data Analysis and Probability (DP) 160

Represent and interpret numerical and categorical data

MA.7.DP.1.1 161

Determine an appropriate measure of center or measure of variation to summarize numerical data, represented numerically or graphically, taking into consideration the context and any outliers.

MA.7.DP.1.2 169

Given two numerical or graphical representations of data, use the measure(s) of center and measure(s) of variability to make comparisons, interpret results and draw conclusions about the two populations.

MA.7.DP.1.3 176

Given categorical data from a random sample, use proportional relationships to make predictions about a population.

MA.7.DP.1.4 182

Use proportional reasoning to construct, display and interpret data in circle graphs.



MA.7.DP.1.5 191

Given a real-world numerical or categorical data set, choose and create an appropriate graphical representation.

Develop an understanding of probability. Find and compare experimental and theoretical probabilities

MA.7.DP.2.1 201

Determine the sample space for a simple event.

MA.7.DP.2.2 205

Given the probability of a chance event, interpret the likelihood of it occurring. Compare the probabilities of chance events.

MA.7.DP.2.3 209

Find the theoretical probability of an event related to a simple experiment.

MA.7.DP.2.4 211

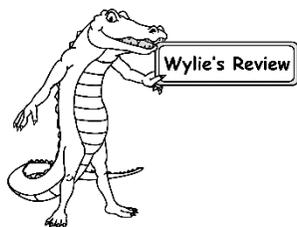
Use a simulation of a simple experiment to find experimental probabilities and compare them to theoretical probabilities.



Rewrite Rational Numbers

Rewrite numbers in equivalent forms.

Rewrite rational numbers in different but equivalent forms including fractions, mixed numbers, repeating decimals and percentages to solve mathematical and real-world problems.



Numbers are given in various ways depending on the context. We can use our knowledge of equivalent forms of numbers to help us compare these different forms. Remember that decimals, fractions, and percentages are related forms.

For example, $30\% = \frac{30}{100}$ since percentages are ratios comparing a quantity to 100.

We can simplify this fraction and create another equivalent form: $\frac{30}{100} \div \frac{10}{10} = \frac{3}{10}$

If we use our understanding of place value, we can rewrite this fraction as a decimal: $\frac{3}{10} = 0.3$

So, we are able to write 30% as $\frac{30}{100}$, $\frac{3}{10}$, and 0.3.

We could write many more forms of the fraction, but the above forms are those that you would work with most often.

Example 1: Write three equivalent forms for -0.25 .

Solution:

We can rewrite the decimal first as a fraction by using place value: $-0.25 = -\frac{25}{100}$

We can rewrite this initial fraction as a percentage: $-\frac{25}{100} = -25\%$

We can simplify this initial fraction $-\frac{25}{100} \div \frac{25}{25} = -\frac{1}{4}$

Three equivalent forms of -0.25 are -25% , $-\frac{25}{100}$, and $-\frac{1}{4}$

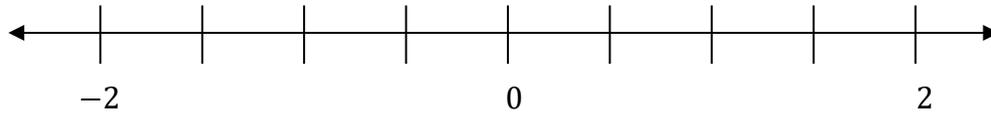
Note: while we gave 3 equivalent forms in the above example, there are other equivalent forms of -0.25 that could be given. When you are asked for equivalent forms, you can give any that are mathematically equivalent.



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Number Sense and Operations – MA.7.NSO.1.2

Example 2: Order the following set of numbers on the given number line.

$$-1, -0.\bar{6}, \frac{1}{3}, -\frac{2}{5}, 12\%, -2.25, 1.5, 150\%, 2$$

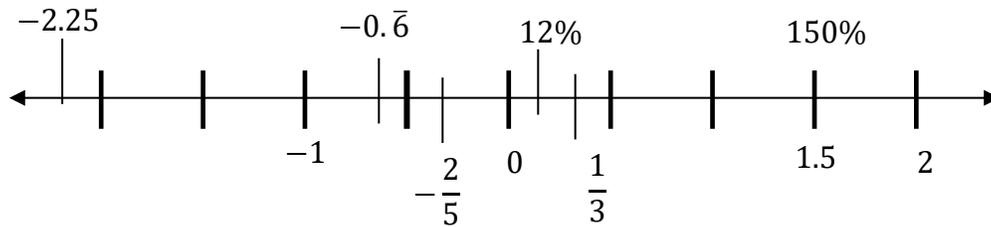


Solution:

Convert any numbers to an equivalent form when necessary.

Here, we will convert any fractions and percentages to decimals:

$$\frac{1}{3} = 0.\bar{3}, -\frac{2}{5} = -0.4, 12\% = 0.12, 150\% = 1.5$$



So, the numbers in order are:

$$-1, -0.\bar{6}, -\frac{2}{5}, 12\%, \frac{1}{3}, 1.5, 150\%, 2$$

Note: You can rewrite the numbers in any equivalent form to order them.

You also might not need to rewrite all numbers to compare them.

Example 3: Josh said he finished $\frac{5}{7}$ of the book he is reading for English class. Ned said he has read more than Josh has because he has completed 65% of the book. Is Ned correct?

Solution:

First, rewrite the numbers to be in the same form so you can compare the amount of the book each boy has read.

$$\frac{5}{7} \approx 0.714 \text{ and } 65\% = 0.65$$

$0.714 > 0.65$, so Ned is not correct. Josh has read more of the book than Ned.

Note that the approximately equal to symbol is used because $\frac{5}{7}$ has a decimal equivalence that continues past the thousandths place. However, we only needed through the hundredths place to compare it to 65%.



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Number Sense and Operations – MA.7.NSO.1.2

Now Try These:

For 1-6, Equation Editor

1. Write an equivalent form for $-1\frac{3}{8}$.
2. Write an equivalent form for 21%.
3. Write an equivalent form for $\frac{16}{40}$.
4. Write an equivalent form for -0.3 .
5. Write an equivalent form for 2.25.
6. Write an equivalent form for $3\frac{1}{2}\%$.

For 7-9, Open Response

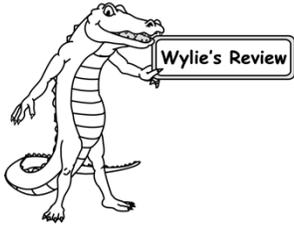
7. Suzie and Mark ran at track practice. Suzie recorded that she ran $\frac{6}{7}$ of a mile. Mark recorded that he ran 85% of a mile. Who ran further?
8. Janelle and Monique are helping create a human number line in math class. Janelle has the number 33% and Monique has the number $\frac{1}{3}$. Janelle says that the girls should stand in the same place since $\frac{1}{3} = 0.33$. Monique disagrees and thinks $\frac{1}{3}$ should be to the right of 33%. Who is correct? Why?
9. Gene can fill 45% of a box with fliers in 5 minutes. Sheila can fill the same size box $\frac{5}{9}$ of the way in the same time. Who fills the box full of fliers at a faster rate?



Circle Graphs

Represent and interpret numerical and categorical data.

Use proportional reasoning to construct, display and interpret data in circle graphs.



We can display data in various ways. A common display is a **circle graph** which is also referred to as a pie chart.

This type of display can be helpful for a quick view of categorical data. The entire sample is represented by the circle and each “slice” represents the amount for a single category.

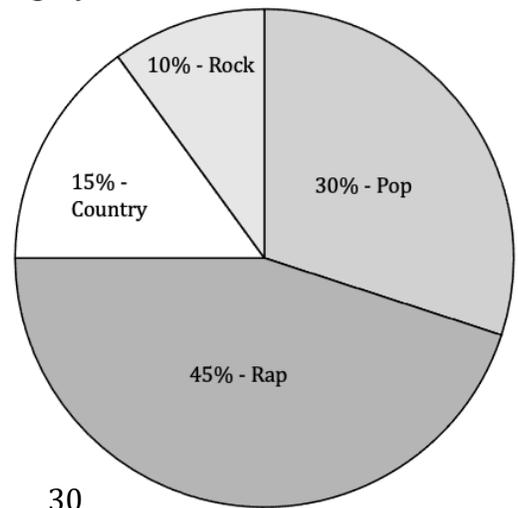
Notice the circle graph to the right:

100 students at a middle school were surveyed about their favorite music genre.

Each piece of the circle graph is labeled with the percentage associated with each genre described by the students.

We can use this data to determine the number of students who liked each genre.

$$15\% = \frac{15}{100} \quad 10\% = \frac{10}{100} \quad 45\% = \frac{45}{100} \quad 30\% = \frac{30}{100}$$



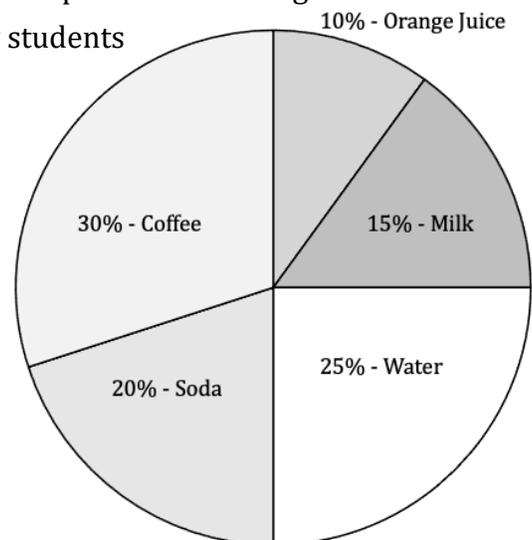
So, we know that 15 students prefer country music, 10 students prefer rock music, 30 students prefer pop music and 45 students prefer rap music.

Example 1: 100 college students were surveyed about their preferred beverage with breakfast. Their responses are shown below. How many students prefer to drink water with breakfast?

Solution:

$$30\% = \frac{30}{100}$$

30 students prefer to drink water with their breakfast.



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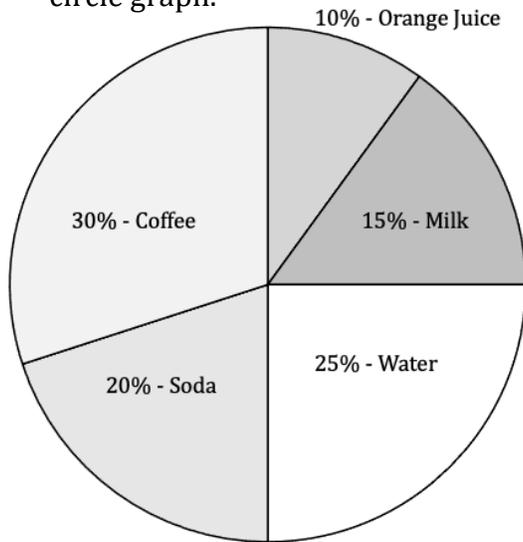
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Data Analysis and Probability – MA.7.DP.1.4

The percentages in a circle graph correspond to more than the number of participants who responded for a certain category.

The percentages also determine the size of the “slices” in the circle graph.

Remember that there are 360° in a circle. We can set up and solve proportions to determine what angles match the percentages from a survey.

We can then use a protractor to measure central angles in the circle and correctly create a circle graph.



Let us use the circle graph to the left to practice determining the angle measures for the different percentage pieces.

We know $30\% = \frac{30}{100}$ and that each circle is 360°

so, $\frac{30}{100} = \frac{x}{360}$.

Create equivalent fractions to solve: $\frac{30}{100} \cdot \frac{3.6}{3.6} = \frac{108}{360}$

A response of 30% for a category will require a piece with a central angle measure of 108° .

Example 2: A local radio host surveyed their listeners one Friday and found that 14% of their listeners listened from the beach, 38% of their listeners listened from work, 46% of their listeners listened from the car, and the rest could be put into a category called other. Determine the measures of the central angles that would be needed to construct a circle graph for this data.

Solution:

Listened from Beach	Listened from Work	Listened from Car	Other
$14\% = \frac{14}{100} \cdot \frac{3.6}{3.6}$ $= \frac{50.4}{360}$	$38\% = \frac{38}{100} \cdot \frac{3.6}{3.6}$ $= \frac{136.8}{360}$	$46\% = \frac{46}{100} \cdot \frac{3.6}{3.6}$ $= \frac{165.6}{360}$	$2\% = \frac{2}{100} \cdot \frac{3.6}{3.6}$ $= \frac{7.2}{360}$
50.4°	136.8°	165.6°	7.2°

Notice that if we add up each of the degree measures, we get to the total circle measure of 360° .



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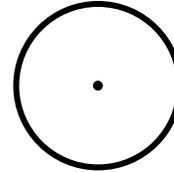
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Data Analysis and Probability – MA.7.DP.1.4

Once we know the measures of the central angles for the categories, we can create a circle graph.

Let's use the information below about how students get home from school to create a circle graph.

Walkers	Public Transportation	Car Rider	School Bus
17%	8%	25%	50%

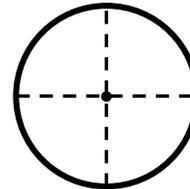
First, we will draw a circle with the center marked.



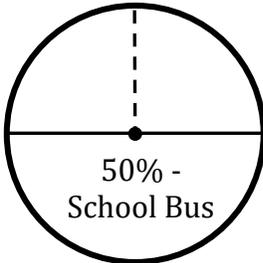
Next, we can draw two diameters to break the circle into four parts, all measuring 90° (since $360 \div 4 = 90$)

Start with the category with the greatest amount.

$$\text{School Bus: } 50\% = \frac{50}{100} \cdot \frac{3.6}{3.6} = \frac{180}{360}$$



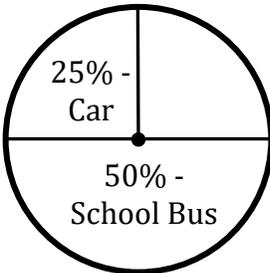
This is equivalent to half of the circle, so we can use one half for students leaving school by school bus.



Now look at the category with the next greatest amount.

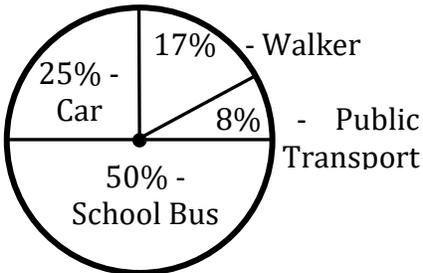
$$\text{Car Rider: } 25\% = \frac{25}{100} \cdot \frac{3.6}{3.6} = \frac{90}{360}$$

This is equivalent to one quarter of the circle, so we can use one of the two sections left for students leaving school by car.



Now we have our final two categories

$$\text{Walker: } 17\% = \frac{17}{100} \cdot \frac{3.6}{3.6} = \frac{61.2}{360}$$



$$\text{Public Transportation: } 8\% = \frac{8}{100} \cdot \frac{3.6}{3.6} = \frac{28.8}{360}$$

The last two categories are approximately 60° and 30°. If we break the last section into thirds, we can create the last two category sections.

*If you have access to a **protractor**, that will be the most accurate way to draw these. Place the protractor over the center of the circle and use the measures to draw the sections.*



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Data Analysis and Probability – MA.7.DP.1.4**

Example 3: A pet store conducted a random survey of 900 elementary school students across the panhandle of Florida to determine the most common family pet. The results are in the table below.

Dog	Cat	Fish	Bird	Lizard	Other
300	225	113	150	75	37

Create and label a circle graph to display the pet store's findings.

Solution:

Determine the percentage for each category based on the 900 students surveyed.

Dog	Cat	Fish	Bird	Lizard	Other
300	225	113	150	75	37
$\frac{300}{900} = 33\frac{1}{3}\%$	$\frac{225}{900} = 25\%$	$\frac{113}{900} = 12\frac{5}{9}\%$	$\frac{150}{900} = 16\frac{2}{3}\%$	$\frac{75}{900} = 8\frac{1}{3}\%$	$\frac{37}{900} = 4\frac{1}{9}\%$

Determine the central angle measures for each category.

Since the percentages are not whole numbers, we can set up proportions using the original fractions in the table.

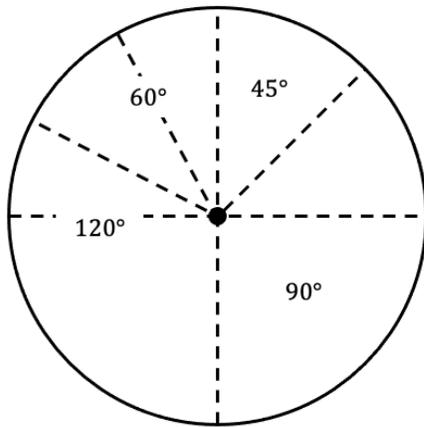
Category	Proportion	Solve for the Angle Measure	Central Angle Measure
Dog	$\frac{300}{900} = \frac{x}{360}$	$\frac{300 \div 2.5}{900 \div 2.5} = \frac{120}{360}$	120°
Cat	$\frac{225}{900} = \frac{x}{360}$	$\frac{225 \div 2.5}{900 \div 2.5} = \frac{90}{360}$	90°
Fish	$\frac{113}{900} = \frac{x}{360}$	$\frac{113 \div 2.5}{900 \div 2.5} = \frac{45.2}{360}$	45.2°
Bird	$\frac{150}{360} = \frac{x}{360}$	$\frac{150 \div 2.5}{360 \div 2.5} = \frac{60}{360}$	60°
Lizard	$\frac{75}{900} = \frac{x}{360}$	$\frac{75 \div 2.5}{900 \div 2.5} = \frac{30}{360}$	30°
Other	$\frac{37}{900} = \frac{x}{360}$	$\frac{37 \div 2.5}{900 \div 2.5} = \frac{14.8}{360}$	14.8°



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Data Analysis and Probability – MA.7.DP.1.4**

Use a protractor to measure out each angle in the circle or split up the circle into known sections and combine to create your circle graph.



Split the circle into four 90° sections.

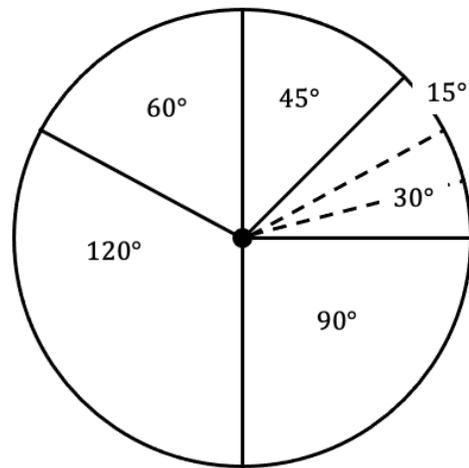
Split one 90° section into three 30° sections.

Split one 90° section into two 45° sections.

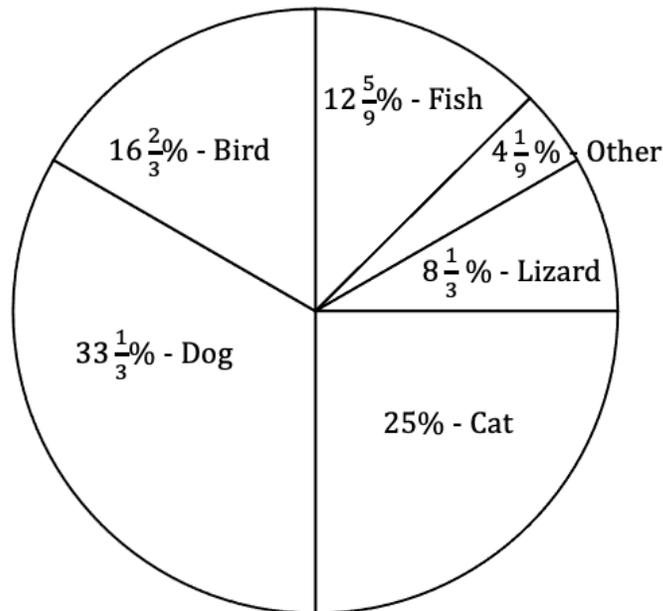
At this point we can see four out of the six sections we need.

Split the remaining 45° section into three 15° sections.

45.2° is very close to 45° and 14.8° is very close to 15° so we can modify the segment between these two measures slightly to make the graph accurate.



Label each section with its corresponding category and percentage:



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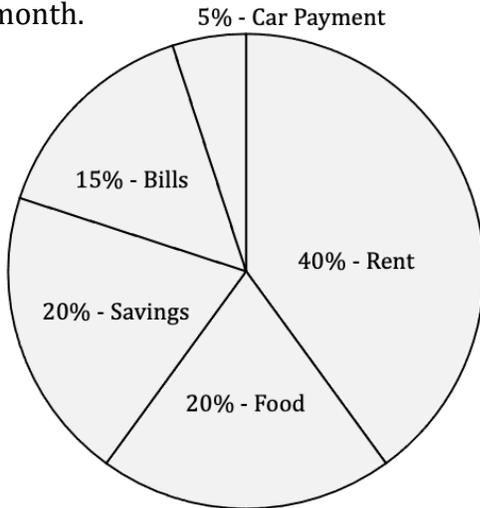
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Data Analysis and Probability – MA.7.DP.1.4

Now Try These:

For 1-2, Equation Editor

For 1-2, Use the information below.

The following shows the way a local retail employee spent their \$1800 pay last month.



1. How much did they spend on their car payment?
2. How much did they spend on their rent and bills last month?
3. The employee is moving and will now only spend 35% of their budget on rent. They want to save the rest. How much more will they save?

4. GRID

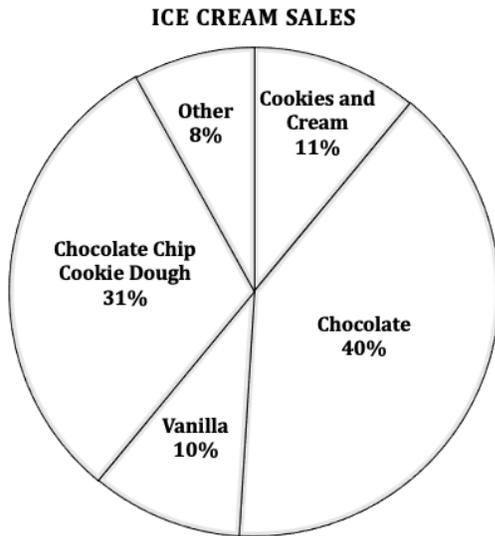
A group has \$500 for their school dance. They know they need to spend 40% of their budget on food, \$150 on decorations, 20% on giveaways, and the rest on a photobooth. Create and label a circle graph to show how the group is planning to spend their budget for the dance.



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Data Analysis and Probability – MA.7.DP.1.4

5. Multiselect

Iggy's Ice Cream had 1,200 customers this weekend. The selection of ice cream purchased by customers can be seen in the circle graph.



Select all of the following which are true based on the information given.

- A. The most popular flavor of ice cream was purchased by 372 customers.
- B. 132 customers purchased vanilla ice cream.
- C. The number of customers who purchased ice cream flavors not listed is 96.
- D. Half of customers purchased vanilla or chocolate ice cream.
- E. The number of customers who purchased chocolate ice cream is 4 times the number of customers who purchased vanilla ice cream.
- F. 120 customers purchased vanilla ice cream.

For 6-9, Use the information given below.

A school principal took notes on the color of uniform shirt students were wearing on Monday. The results are shown below.

Navy	White	Grey	Yellow
50	150	75	25

For 6-8, Equation Editor

- 6. How many students did the principal see on Monday?
- 7. What percentage of students wore yellow shirts on Monday?
- 8. When creating a circle graph, what will be the central angle measure of the piece of the graph for those wearing grey shirts?

9. GRID

Create and label a circle graph for the data in the table.



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Data Analysis and Probability – MA.7.DP.1.5

Choose and Create Appropriate Displays for Data

Represent and interpret numerical and categorical data.

Given a real-world numerical or categorical data set, choose and create an appropriate graphical representation.



There are various ways we can display data. Common displays for data include stem-and-leaf plots, circle graphs, bar charts, line (or dot) plots, histograms, and box plots (or box-and-whisker plots)

Each of these data displays comes with advantages and disadvantages. Let's look at each display and some data that works well. Sometimes, you may find more than one data display will be appropriate for a situation.

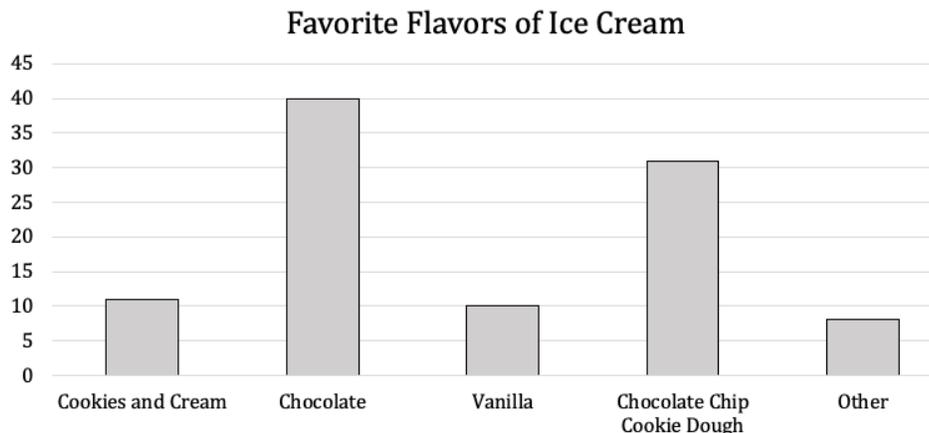
There are two types of data you may see – numerical and categorical. There are fewer data displays for categorical data than there are for numerical data.

A group of 100 people were surveyed about their favorite flavor of ice cream. The table below lists the results

Cookies and Cream	Chocolate	Vanilla	Chocolate Chip Cookie Dough	Other
11	40	10	31	8

This is categorical data since we have values assigned to different categories. We have two displays that are appropriate for categorical data: **Bar Charts** and **Circle Graphs**.

To create a **bar chart**, we will need to set up two axes: one labeling the categories and one to list the amounts for the categories. Be sure to scale your axis so all amounts will fit onto your bar graph. Then create bars that match the amount in each category.



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Data Analysis and Probability – MA.7.DP.1.5**

To create a **circle graph**, we will need to determine the percentages for each of the categories and the accompanying central angle measures for the circle.

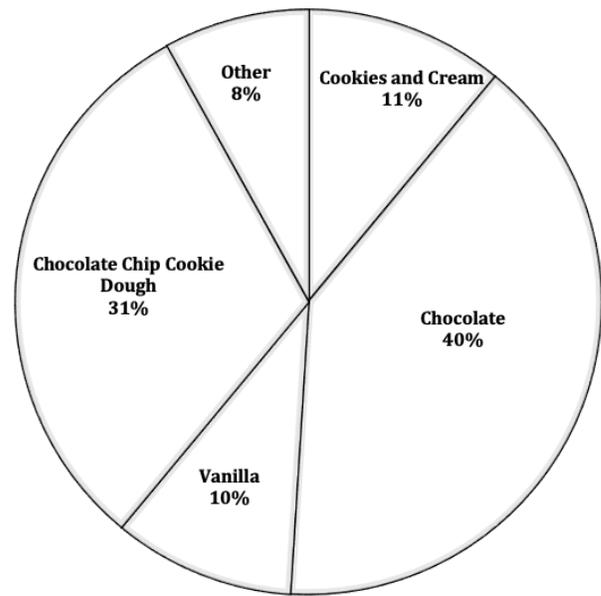
Category	Cookies and Cream	Chocolate	Vanilla	Chocolate Chip Cookie Dough	Other
Frequency	11	40	10	31	8
Percentage	11%	40%	10%	31%	8%
Central Angle	39.6°	144°	36°	111.6°	28.8°

Use a protractor or split the circle up into manageable pieces to construct the circle graph.

Notice in both graphs we are able to see how the category amounts compare to each other.

In the circle graph, we can see how the categories compare to the entire situation.

In the bar chart, we are able to read the amounts in each category without calculating any totals. In the circle graph, we would have to be told the total population surveyed and then calculate category totals using the percentages.



Bar charts may have two advantages over circle graphs:

- comparisons between the categories are more easily seen
- circle graphs become less useful for data sets with more than 6 categories

Note that in bar charts, the bars may also be horizontal with the numbered axis across the bottom of the chart.



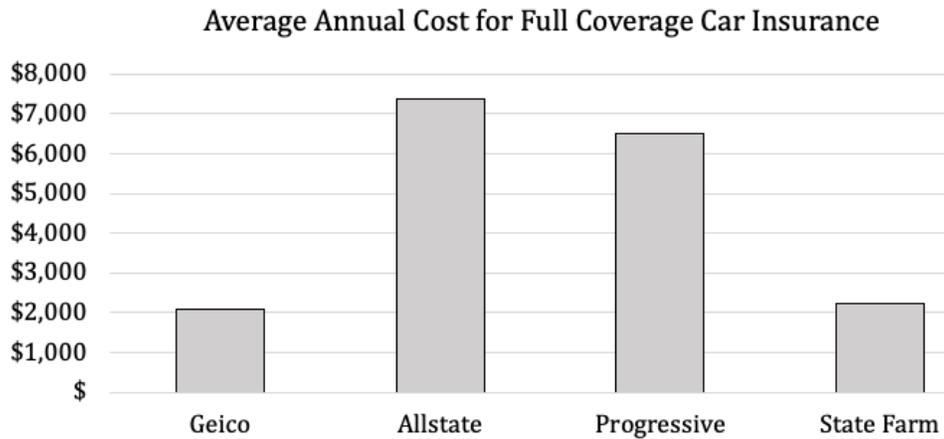
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Example 1: Choose and create a display for the data shown in the table below.

Average Annual Cost for Full Coverage Car Insurance in Florida			
Geico	Allstate	Progressive	State Farm
\$2,097	\$7,372	\$6,498	\$2,229

Solution:

This type of data would not be easily comparable in a circle graph, so we would want to create a bar chart.



Let's look at some other types of displays for *numerical* data:

There are several display types that are good for numerical data. Three types are based on a number line: line plots, box plots, and histograms.

A **line plot** is a simple graph that uses marks (often dots or X) to stack data vertically on top of the numerical value it represents. This type of graph tells us the **frequency** of the data. It is similar to the bar chart we created for categorical data.

Line plots are very simple to read and make generalizations about the data since it is visually stacked. However, line plots are not good for large quantities of data, since they require individual marks for each data point.

Example 2: Create a line plot for the temperatures during the first 14 days of February.

Temperatures for February 1st through February 14th, in degrees Fahrenheit, were:

23, 30, 27, 32, 28, 27, 20, 23, 22, 25, 28, 27, 26, 22



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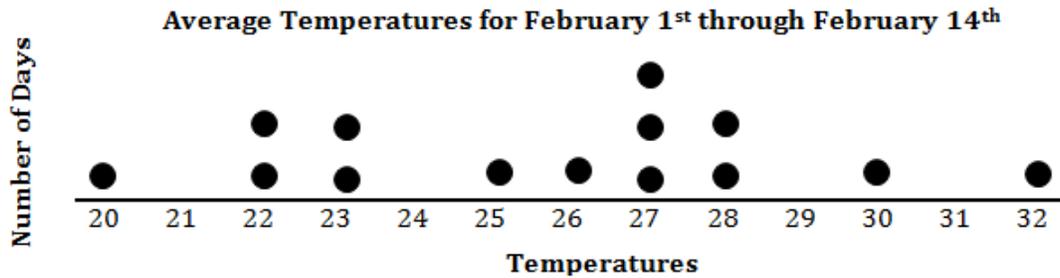
Solution:

To create a **line plot**, we will use the following steps:

Step 1: Draw a number line and mark the values. In this case, the number line starts at 20 and ends with 32. The line will have a scale of one.

Step 2: Plot dots on the number line above the corresponding number on the graph.

Step 3: Title and label the graph.



Histograms use a horizontal number line for a base; however, the number line uses an interval range of numbers for each group of data. Vertical bars corresponding to a vertical number line are used to denote the frequency for each interval

Histograms are easy to read due to their vertical bars. Histograms are very good for large quantities of data that can be compiled into intervals.

Example 3: Create a histogram to display the temperatures for the month of February.

Temperatures for February in degrees Fahrenheit:

23°, 30°, 27°, 32°, 28°, 27°, 20°, 23°, 22°, 25°, 28°, 27°, 26°, 22°, 19°, 24°, 26°, 27°, 31°, 33°, 30°, 22°, 32°, 25°, 28°, 29°, 30°, 35°, 32°

Solution:

To create a **histogram**, use the following steps:

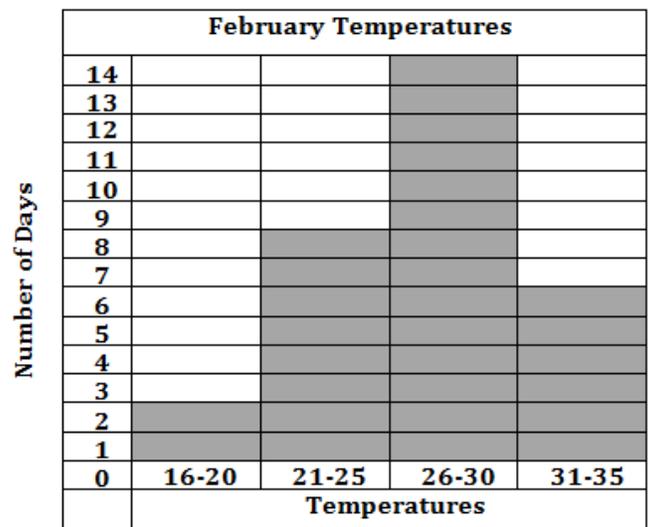
Step 1: draw a horizontal number line and create a scale using intervals.

- we can determine the intervals to use by setting up a frequency table.

Step 2: Draw a vertical number line and create a scale using the frequency of the data.

Step 3: Draw bars above the horizontal number line, making sure the bars are touching.

Step 4: Title the graph and label the number lines



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The **box plot** uses a number line but places a box over the number line showing the lower quartile, median, and upper quartile for the data. There are arms (or whiskers) that extend out of each side of the box to the minimum and maximum values.

Similar to a histogram, a box plot does not have reflect individual data points. Unlike the line plot or histogram a box plot does not reflect frequency at all. Instead, it is a visual display of the variation within a data set.

Box plots make it very easy to see a set of data's median, minimum, and maximum values. It also shows how data is clustered within the set.

Example 4: Plot the temperatures for the month of February in a box plot.

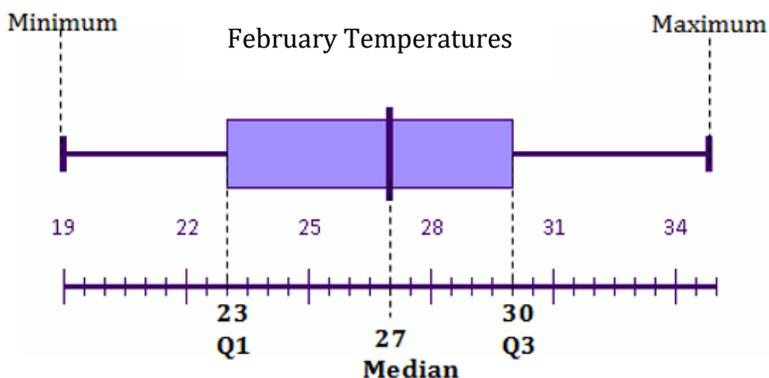
Temperatures for February in degrees Fahrenheit:

23, 30, 27, 32, 28, 27, 20, 23, 22, 25, 28, 27, 26, 22, 19, 24, 26, 27, 31, 33, 30, 22, 32, 25, 28,
29, 30, 35

Solution:

Step 1: Order the data and find the five-number summary:

- minimum – least value in the data set
- maximum – greatest value in the data set
- median – center of the data set when ordered from least to greatest.
- lower quartile (Q1) – median of the lower half of data
- upper quartile (Q3) – median of the upper half of data



Step 2: Draw a horizontal number line with a scale that matches the data in the set.

Step 3: Mark the minimum, maximum, median, lower quartile, and upper quartile on the number line using small, vertical segments.

Step 4: Connect the lower quartile to the upper quartile to create a box.

Step 5: Extend horizontal line segments out of each side of the box to connect the box to the minimum and maximum.

Notice that we cannot see the individual values from the data set we started with. Instead, we can see key values such as the minimum and maximum as well as the median. This type of display shows us the data broken into four segments where 25% of the data is in each quartile. This helps us see how the data varies and if it is clustered.



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Note that in our line plots example, we did not use an entire month of data. Line plots can be time consuming to create, and so are generally most useful for smaller data sets.

It is important to remember:

- **Line plots** include individual data points and are used to measure frequency
- **Histograms** include intervals of data points and are used to measure frequency
- **Box plots** are used to measure variation and see the cluster of a data set

The last data display we will look at is the **stem-and-leaf plot**. The stem-and-leaf plot is a table display based on place value that displays the frequency of numerical data. Like a line plot, the stem-and-leaf plot shows all values in a data set and can be time consuming to create for large data sets.

Example 5: Create a stem-and-leaf plot for the temperatures during the first 14 days of February.

Temperatures for February in degrees Fahrenheit:

23, 30, 27, 32, 28, 27, 20, 23, 22, 25, 28, 27, 26, 22, 19, 24, 26, 27, 31, 33, 30, 22, 32, 25, 28,
29, 30, 35

Solution:

Step 1: Order the data from least to greatest

Step 2: Set up a two-column table where the tens place and greater is listed in the left column and the ones place is listed in the right column.

Step 3: List all of the ones place values with their corresponding tens.

Step 4: Give a key for the data if necessary

Temperatures in February, in degrees Fahrenheit

0	
1	9
2	0, 2, 2, 2, 3, 3, 4, 5, 5, 6, 6, 7, 7, 7, 7, 8, 8, 8, 9
3	0, 0, 0, 1, 2, 2, 3, 5
4	

$1|9 = 19$



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Now Try These:

For 1-5, Open Response

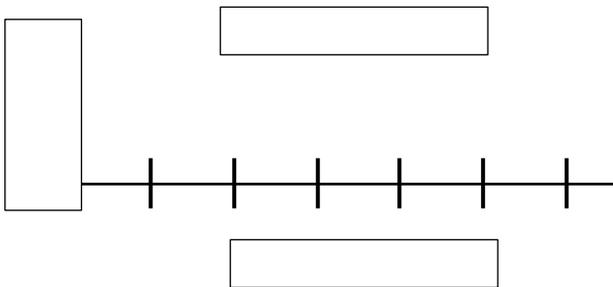
For 1-5, Select an appropriate type of display for the given situation

1. The math final exam scores for an entire 8th grade.
2. The hourly pay rate for the employees at a local grocery store.
3. The number of pets each student in an elementary school has.
4. The number of minutes all 75 members of a large gym spend exercising.
5. The number of minutes each student in a class of 20 spends on their phone each day.

For 6-9, GRID

6. Sally surveyed 15 people in the New Blue jean store to learn how many pairs of jeans they were buying. Use the number line to create a line plot to show the data.

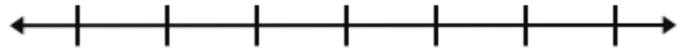
4, 5, 3, 2, 1, 1, 3, 2, 1, 4, 3, 4, 2, 3, 1



7. Mr. Herald would like to see how many of his students fell into each quartile.

Use the number line to create a box plot using the test score data.

<p>Test Scores: 52, 45, 67, 82, 31, 66, 43, 55, 48, 89, 82, 55, 91, 37, 85, 66, 85, 76, 87, 52, 73</p>

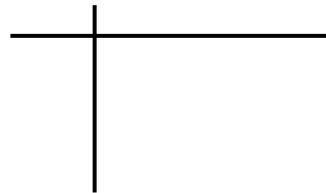


- For 8-10,** Use the following information.

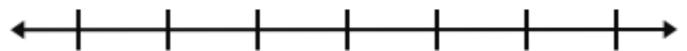
The following lists the number of grams of sugar in various snacks in a vending machine.

{10, 24, 13, 1, 48, 11, 16, 12, 18, 37, 10, 1, 20, 18, 36}

8. Create a stem and leaf plot for the data.



9. Create a box plot for the data.



Determine Sample Space

Develop an understanding of probability. Find and compare experimental and theoretical probabilities.

Determine the sample space for a simple experiment.

Probability is the chance that an event will occur. Probability experiments are those that have more than one possible outcome. All of the possible outcomes are part of the **sample space** of an

Flipping a coin is considered an event. There are two possible outcomes when flipping a coin: Heads and Tails.

The **sample space** of this event is heads and tails. We can list the sample space in some of the following ways:

Heads, Tails

{heads, tails}

{h, t} where h is heads and t is tails

Example 1: Determine the sample space of rolling a fair, 6-sided die.

Solution:

A 6-sided die is numbered 1-6. So the sample space is {1, 2, 3, 4, 5, 6}

In the two events described above, there was only one of each possibility listed. The sample space contains all of the possible outcomes.

Pablo is picking a piece of candy from a jar in math class. The jar contains 4 fruit-flavored candies, 3 chocolate candies, and 2 mints.

The sample space for this event is: {f, f, f, f, c, c, c, m, m} where f is fruit-flavored, c is chocolate, and m is mint

We list everything we could possibly select from the jar as the sample space.

Example 2: Johanna is choosing a marble from a bag containing 2 yellow marbles and 3 blue marbles. Determine the sample space for this event.

Solution:

There are two possible outcomes: choosing yellow and choosing blue.

The same space is {yellow, yellow, blue, blue, blue}



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Now Try These:

For 1-5, Open Response

For 1-5, List the sample space for the experiment described.

1. Selecting a flower from a bouquet with 4 white flowers, 10 yellow flowers, and 1 blue flower.

2. Choosing a candy from a bag containing chocolates, peppermints, caramels, and lollipops.

3. Landing on a section of a spinner with 6 equal sections of red, orange, yellow, green, blue, and purple.

4. Selecting an envelope from a group of 4 containing cash, coupons, gift cards, or tickets.

5. Choosing a card from a set of cards with 2 brown, 2 black, 2 orange, 2 red, and 2 blue cards.

6. Multiple Choice

Xiomara is selecting a marble from a jar containing 3 tie-dye marbles, 4 solid green marbles, and 3 clear marbles. Which of the following statements is true about the sample space of this event?

- A. There are 3 possibilities listed in the sample space.
- B. The sample space is {tie-dye, green, clear}
- C. The same space is tie-dye, tie-dye, tie-dye, green, green, green, green, clear, clear, clear.
- D. The sample space does not contain the tie-dye marbles.

7. Multiple Choice

Cindy cut up the letters for the word ORLANDO and put them in a bag. Which of the following describes the number of items in the sample space?

- A. 7
- B. 6
- C. 5
- D. 2

