



# Data Analysis and Probability

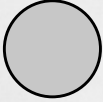
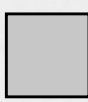


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# How to Use This Product

## Readability Chart

| Title of the Text           |  |  |  |  |
|-----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                             | Star                                                                              | Circle                                                                            | Square                                                                             | Triangle                                                                            |
| Collecting Data             | 2.2                                                                               | 3.5                                                                               | 5.0                                                                                | 6.6                                                                                 |
| Creating Pictographs        | 2.2                                                                               | 3.3                                                                               | 5.3                                                                                | 6.5                                                                                 |
| Analyzing Pictographs       | 2.1                                                                               | 3.4                                                                               | 5.2                                                                                | 6.8                                                                                 |
| Creating Bar Graphs         | 1.9                                                                               | 3.4                                                                               | 5.0                                                                                | 6.8                                                                                 |
| Analyzing Bar Graphs        | 2.2                                                                               | 3.5                                                                               | 5.3                                                                                | 6.6                                                                                 |
| Creating Line Graphs        | 2.2                                                                               | 3.5                                                                               | 5.0                                                                                | 6.6                                                                                 |
| Analyzing Line Graphs       | 2.2                                                                               | 3.5                                                                               | 5.2                                                                                | 6.5                                                                                 |
| Creating Circle Graphs      | 2.2                                                                               | 3.4                                                                               | 5.3                                                                                | 6.5                                                                                 |
| Analyzing Circle Graphs     | 2.2                                                                               | 3.1                                                                               | 5.0                                                                                | 6.5                                                                                 |
| Comparing Graphs            | 1.9                                                                               | 3.0                                                                               | 5.0                                                                                | 6.5                                                                                 |
| What Does <i>Mean</i> Mean? | 2.2                                                                               | 3.5                                                                               | 5.1                                                                                | 6.6                                                                                 |
| Median in the Middle        | 2.1                                                                               | 3.5                                                                               | 5.1                                                                                | 6.5                                                                                 |
| Mode and Range              | 2.2                                                                               | 3.0                                                                               | 5.1                                                                                | 6.5                                                                                 |
| Probability of Events       | 2.2                                                                               | 3.5                                                                               | 5.0                                                                                | 6.6                                                                                 |
| Probability Experiments     | 2.2                                                                               | 3.1                                                                               | 5.3                                                                                | 6.6                                                                                 |

## Components of the Product

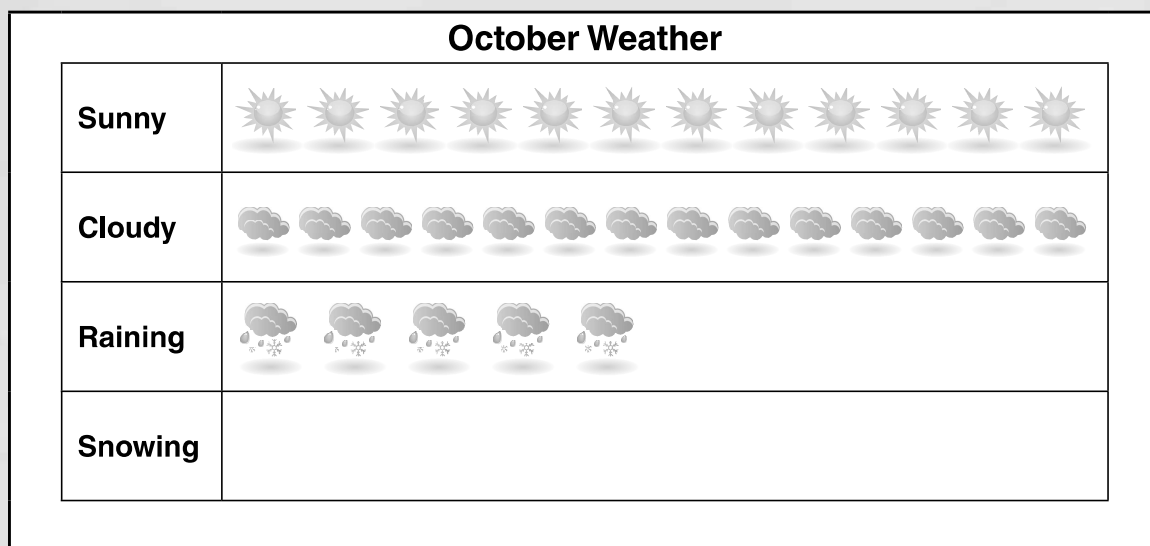
### Strong Image Support

- Each level of text includes multiple primary sources. These images, photographs, and illustrations add interest to the texts. The mathematical images also serve as visual support for second-language learners. They make the texts more context-rich and bring the examples to life.



# Creating Pictographs

Marvin and Zuna wanted to keep track of the weather. They did this for the month of October. Every morning they would check outside. Then they would draw a picture of the weather. The chart they made is below. Why do you think there are no pictures in the “snowing” row?



## Basic Facts

One way to show data is to use a **pictograph**. Pictographs are picture graphs. They use pictures to show data. They are also called *pictograms*. Or, they are called *picture graphs*. Each picture in the chart can stand for one piece of data. Or, it can stand for a whole group. In the chart above, they used a picture to show each day. There are no pictures in the “snowing” row. It did not snow that month.

## When a Picture Is Worth More Than a Piece of Data

Pictographs can be used to show a lot of data. It may not be a good idea to use one picture for each item. You might want each picture to show a group. Let us say that Mrs. Lundy’s class wants to make a pictograph. They want to show what lunches people choose. The school has 300 people. So that would be a lot of drawings! Each picture stands for 20 meals instead of one meal. The key on the graph tells us this. That lets the chart stay much smaller. And it is easier to read.

But, what if the total number does not equal a group of 20? Pictographs can use parts of pictures. These pictures show smaller amounts. For example, half a picture would be 10 lunches.

But, what if the partial picture is meant to show 9 lunches? Or 11 lunches? It is hard to divide a picture to show this. We might not know the right amounts for sure. The person who made the graph must tell us. That is one of the drawbacks of a pictograph.

## Creating a Pictograph

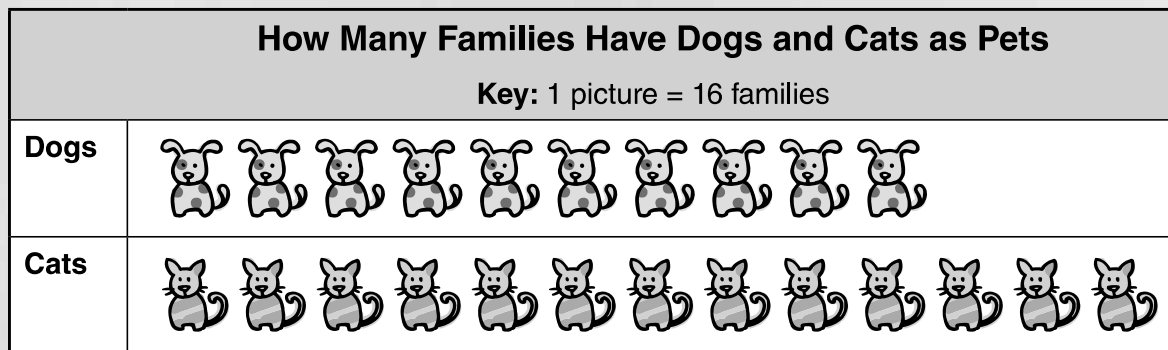
David wants to show how many families in his school have cats and dogs. He finds out that 208 families have cats. There are 160 families that have dogs. He wants to make a pictograph to show this data.

**Step 1: Decide how many items each picture will represent.** Often people choose factors of 10. But, different numbers make sense, too. A good choice might be to use a common factor. David notices that 208 and 160 are both divisible by 16.  $208 \div 16 = 13$  and  $160 \div 16 = 10$ . He chooses to make each picture equal to 16 families. He notes his choice in a key.

**Step 2: Decide on a picture.** It should be something that looks like your data. You will need to use it many times. You might want to draw your pictures by hand. If so, choose something simple. David chooses to use a dog and cat! He labels the rows to show what they stand for.

**Step 3: Create your graph.** Draw pictures to show all the data. Make sure the partial pictures show the right amount. Be neat and clear. Make sure your pictures are the same size. If they are not, it will be hard to see the contrast.

**Step 4: Give your graph a descriptive name and key.** The title should tell you what the graph shows. The key should show you how much data each picture stands for. You can choose to leave out the key. But you can only do this if each picture shows one piece of data.



## Pictographs in Our Daily Lives

Many newspapers use pictographs. And magazines use them, too. Pictographs are eye-catching. And they are easy to understand. They can be colorful. And they are a great way to show contrast. This makes them an ideal tool. They can help make data easy to understand.

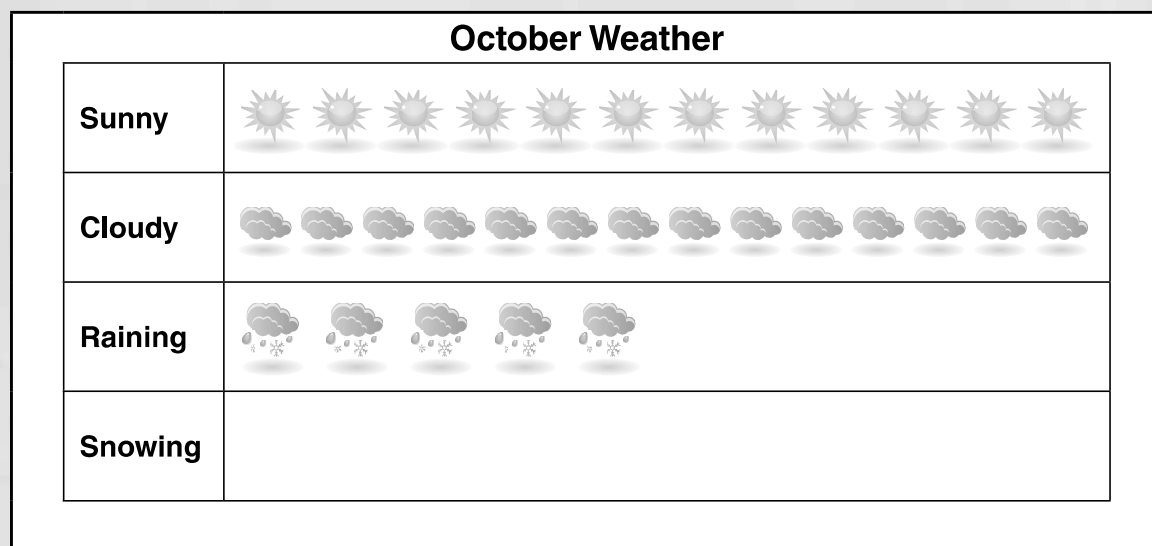


## You Try It

Create a pictograph. Show the favorite colors of the kids in your class.

# Creating Pictographs

Marvin and Zuna wanted to keep track of the weather in their area. They did this for the month of October. Every morning they would check outside. Then they would draw a picture of what the weather was like. The chart they made is below. Why do you think there are no pictures in the “snowing” row?



## Basic Facts

One way to show data is to use a **pictograph**. A pictograph is a graph that uses pictures to show the data. Sometimes they are called *pictograms* or *picture graphs*. Each picture in the chart can stand for one piece of data. Or, it can stand for a group of data points. In the example above, the children used a picture to show each day. There are no pictures in the “snowing” row. That is because it did not snow that month.

## When a Picture Is Worth More Than a Piece of Data

Pictographs can be used to show a lot of data. It may not be practical to use one picture for each piece of data. Instead, each picture shows a group. Let us say that Mrs. Lundy’s class wants to make a pictograph. They want to show how many people at school choose different lunches. The school has 300 people. So that would be a lot of drawings! Each picture on the graph stands for 20 meals instead of one meal. The key on the graph tells us this. That lets the chart stay much smaller. And it is easier to read.

But, what happens if the total number does not equal a group of 20? Pictographs can use parts of pictures to show smaller amounts. For example, half a picture would be 10 lunches.

But, what if the partial picture is meant to show 9 lunches? Or 11 lunches? It is hard to divide a picture to show this. We cannot be sure of the exact amounts. The person who made the graph must tell us. That is one of the drawbacks of a pictograph.

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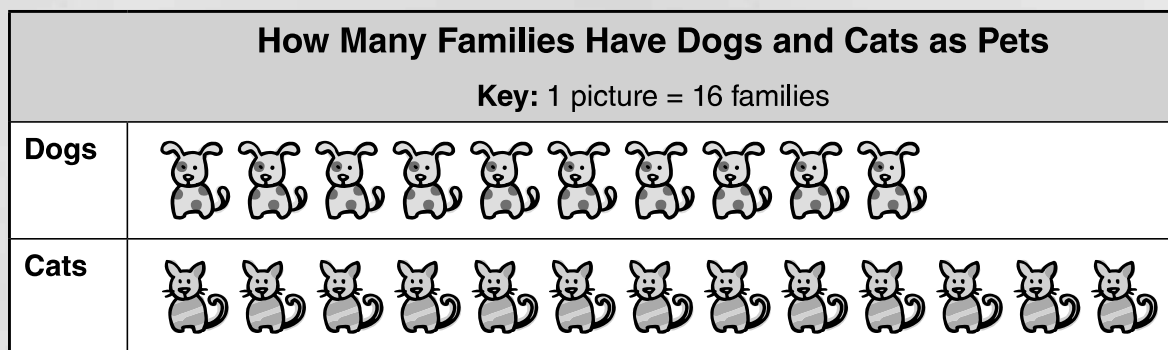
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**Step 3: Create your graph.** Draw pictures to show all the data. Make sure the partial pictures show the right amount. Be neat and clear. Make sure your pictures are the same size. If they are not, it will be hard to see the comparison.

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## Pictographs in Our Daily Lives

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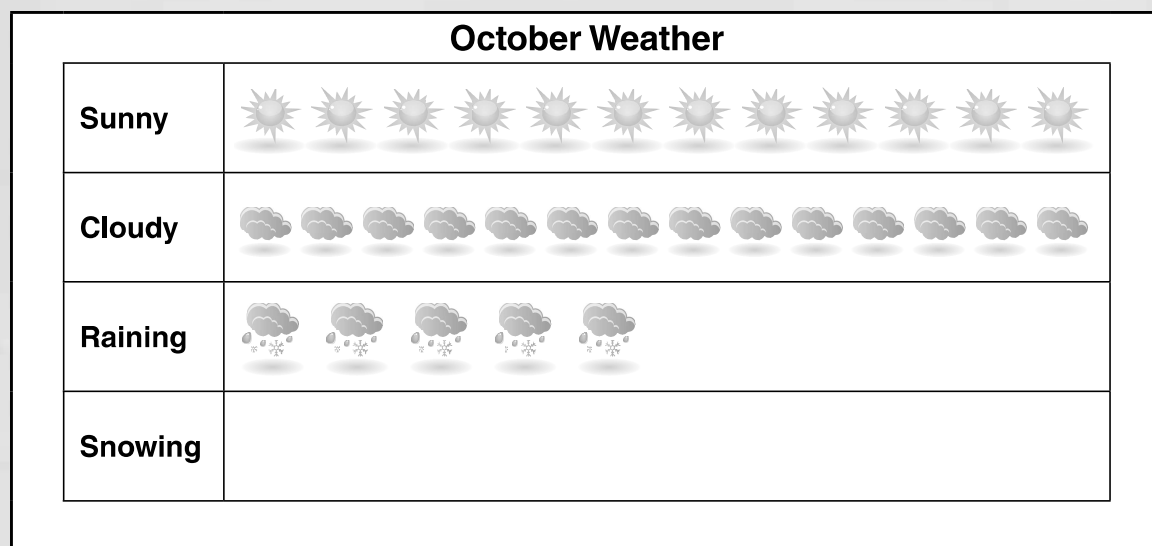


## You Try It

Create a pictograph. Show the favorite colors of the students in your class.

# Creating Pictographs

Marvin and Zuna wanted to keep track of the weather in their area for the month of October. Every morning they would get up and check outside. Then they would draw a picture of what the weather was like. The chart they made is below. Why do you think there are no pictures in the “snowing” category?



## Basic Facts

One way to display data is to use a **pictograph**. A pictograph is a graph that uses pictures to show the data. Sometimes they are called *pictograms* or *picture graphs*. Each picture in the chart can represent one piece of data or a group of data points. In the example above, the children used a picture to represent each day. There are no pictures in the “snowing” row because it did not snow in October.

## When a Picture Is Worth More Than a Piece of Data

Often pictographs are used to show large groups of information. It may not be practical to use one picture for each piece of data. Instead, each picture shows a group. For instance, let us say that Mrs. Lundy’s class wants to make a pictograph showing how many people at the school chose different lunches. The school has 300 people, so that would be a lot of drawings! Instead of each picture standing for one meal, the key on the graph tells us that each picture stands for 20 meals. That lets the chart stay much smaller and easier to read.

But, what happens if the total number does not equal a group of 20? Pictographs use partial pictures to show smaller amounts. For example, half a picture would equal 10 lunches.

But, what if the partial picture is meant to represent 9 or 11 lunches? It is hard to divide a picture accurately to show this. We cannot be sure of the exact amounts unless the person who made the graph tells us. That is one of the drawbacks to using a pictograph.



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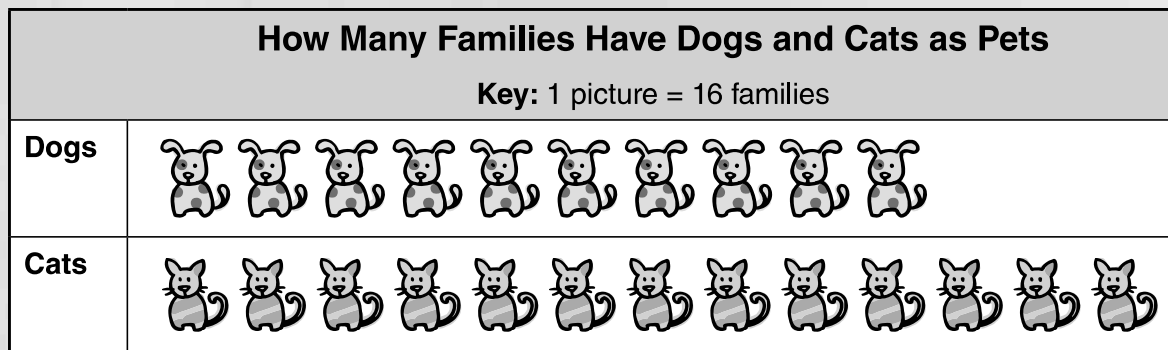
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## Pictographs in Our Daily Lives

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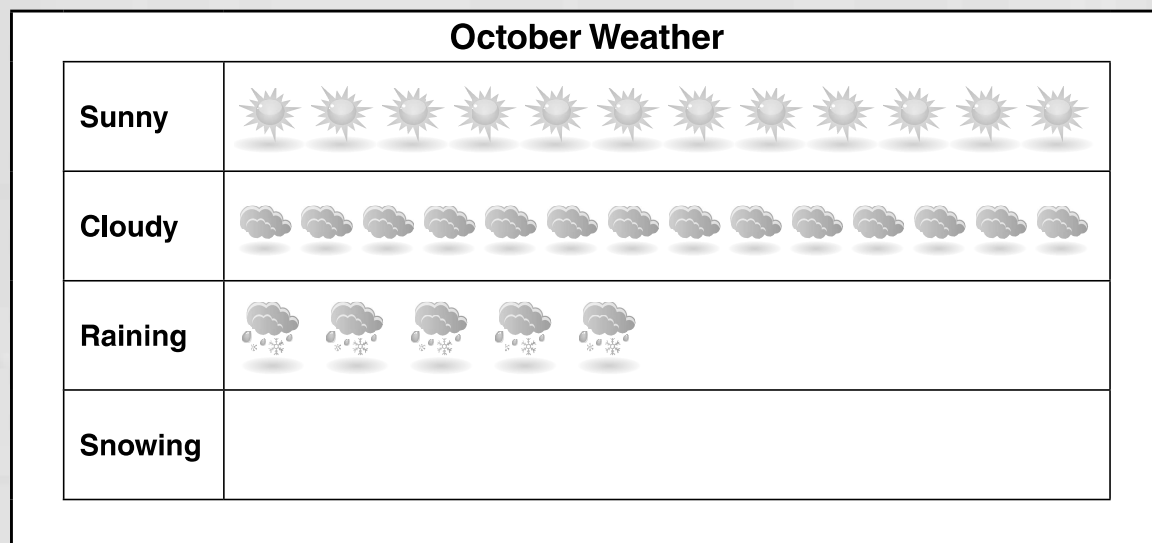
## You Try It

34

Create a pictograph showing the favorite colors of the students in your class.

# Creating Pictographs

Marvin and Zuna wanted to keep track of the weather in their area for the month of October. Every morning they would get up and check the weather outside. They would draw a picture of what the weather was like and then record their results on the chart below. Why do you think there are no pictures in the “snowing” category?



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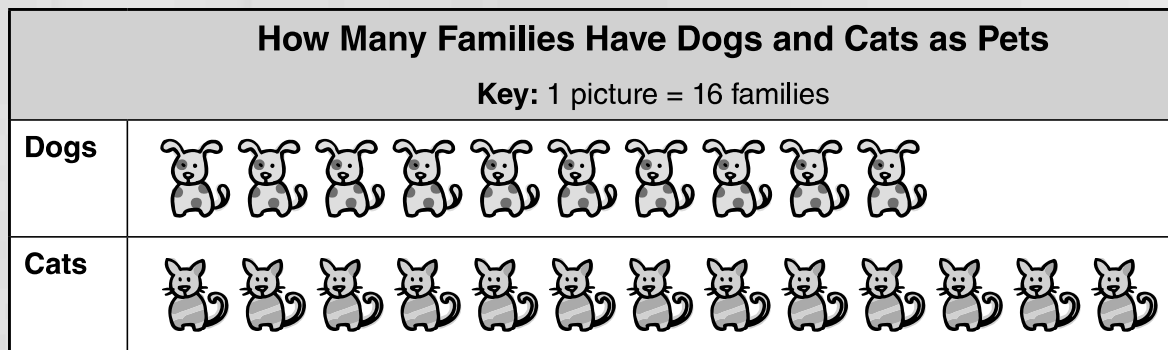
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