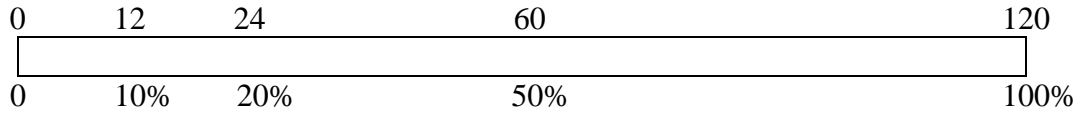


## Percent Bars – Instructor Information

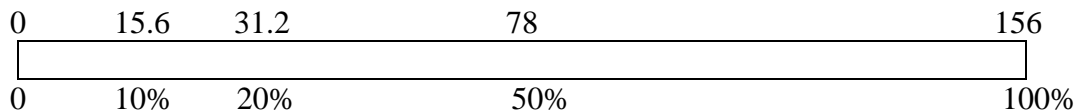
Percent may be found in a formulaic manner, but the percent bar is a more visual way to help students understand and determine percents. For instance,  $10\%$  of  $120 = 0.10 \times 120 = 12$  square feet. You may want to introduce the percent graph as shown below.



In this instance, students can measure the 50% mark and fold or subdivide the remaining portions. It is not easily possible to fold to 10%.

Window area to floor area is often called for in building codes. For instance, in one municipality the window area is expressed as a percentage of floor area. If the window area should be 20% of the floor area, the area of a 12 by 13 foot room is  $12 \times 13 = 156$  square feet.

The window area is 20% of floor area, or  $0.20 \times 156 = 31.2$  square feet



You might ask students what the dimensions of a square window with an area of 31.2 square feet would be. Let the side length be  $L$ , thus

$$31.2 = L \times L = L^2$$

Take the square root of both sides (using a calculator)

$$5.58 = L \quad \text{or the length of one side is 5.58 feet}$$

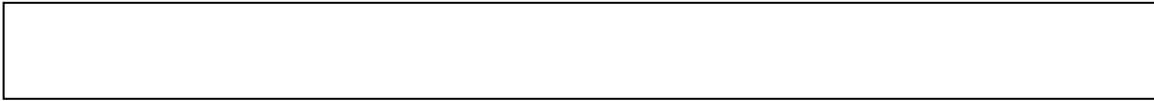
If students have something more physical to deal with in learning percents, it is possible to use a strip of paper as the percent bar and fold it into one-half, 50%, etc. The following discussion uses this technique and then moves to regular math problems.

## Getting Comfortable with Percents

The Mathematics in Context Curriculum<sup>\*</sup>, developed at the University of Wisconsin-Madison and funded by the National Science Foundation, uses **percent bars** to solve percent problems.

0%

100%



Things to know about a percent bar:

- (1) A full shaded bar is 100%.

For students, it may be difficult to understand what 100% means.

Try some of these discussion questions:

1. ***I ate 100% of my candy bar.***  
***How much of the candy was eaten?***
2. ***I invited 100% of the class to my birthday party.***  
***How many people received invitations?***
3. ***I went to the mall and 100% of the parking spots were taken.***  
***How many spots were taken?***

By this time, the students should be using words like ***all, full***, etc.

- (2) An unshaded bar is 0%

It may also be difficult to understand what 0% means.

Try some of these discussion questions:

1. ***I did 0% of my homework.***  
***How much of the homework was completed?***
2. ***My Aunt gave me 0% of money needed to buy that IPOD.***  
***How much money did you get from your aunt?***
3. ***My cousin scored 0% of the points scored on our team.***  
***How many points did my cousin score?***

By this time, the students should be using works like ***none, zero***, etc.

- (3) You can fold the bar into:

- a. Half (50%)
- b. Quarters (25%, 75%)
- c. Tenths (10%)

These are considered ***benchmark*** percents.

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\* Homepage: <http://mic.britannica.com/mic/common/home.asp>

*Using the Percent Bar to Answer Questions*

1. Jasmine got 15 out of 20 on her quiz. What percent of the questions did she get correct?

Number on the fold \_\_\_\_\_ Percent \_\_\_\_\_

Full Bar \_\_\_\_\_

2. Andrew was given an allowance of 20. 40% of this allowance was used to go to the movies. How much money was spent on the movies?

Number on the fold \_\_\_\_\_ Percent \_\_\_\_\_

Full Bar \_\_\_\_\_

3. Lin is saving money to buy a computer. She has saved \$150. This is only 60% of the amount that she needs. How much money does she need to buy the computer?

Number on the fold \_\_\_\_\_ Percent \_\_\_\_\_

Full Bar \_\_\_\_\_

If you look at the completed bars, you can see the ratios!

Now, move the students from the manipulative to the algebra.

4. There were 1,984 people at the Long Island Ducks Game at 6:00pm. The stadium holds 6,200 people. What percent of the seats were taken at 6:00pm?
5. Frankie is traveling across country with his family. They have already traveled 286 miles which means they have only completed 26 % of their trip so far. How long is their trip?
6. Marcello went to dinner with his whole family. They had a very large group, so the tip for the waiter was 18% of the bill. The bill was \$520. How much was the tip?