Stat Support Activity: Rounding Rules

Notes

Place Values

To round, we need to review place values. For example, look at the number 3.12589

3	.	1	2	5	8	9
Ones		Tenths	Hundredths	Thousandths	Ten-Thousandths	Hundred-Thousandths

For example, tenths means out of 10. So 0.1 means 1 tenth or 1/10. 0.02 means 2 hundredths or 2/100, 0.005 means 5 thousandths or 5/1000 and so on.

Rounding Decimals

To correctly round a decimal, we need to decide to which place value we want to round to. We then look to the right of that place value. If the number to the right is 5 or above, we will round up by adding one to the place value. If the number to the right is 4 or below, we will round down by leaving the place value alone. The key to remember is that after rounding, we want to stop after the place value so that the number is simpler to use.

For example, round 0.03792 to the hundredths place. The hundredths place is the 3. Looking to the right of it we see a 7. Since 7 is large (5 or above) we round up by adding 1 to the place value. So the 3 becomes 4 and we cut off the rest of the numbers.

$$0.03792 \approx 0.04$$

Let's try another example. Round 1.83597 to the tenths place. The tenths place is the 8. Looking to the right of it we see a 3. Since 3 is small (4 or below) we round down by leaving the place value alone. So the 8 stays as it is and we cut off the rest of the numbers.

$$1.83597 \approx 1.8$$

Categorical Data: Rounding Rules for Proportions and Percentages

We usually round proportions to the thousandths place, that is the third number to the right of the decimal.

We usually round percentages to the tenths place, that is one number to the right of the decimal.

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Quantitative Data: Rounding Rule

For statistics calculated from quantitative data round the statistic to one more decimal place to the right than the original data has.

For example. The following column of data is rounded to the tenths place. (One number to the right of the decimal.) So any statistic we calculate from this data should have two numbers to the right of the decimal or the hundredths place.

Weight (Lbs)
114.8
149.3
107.8
160.1
127.1
123.1
111.7
156.3
218.8
110.2
188.3
105.4
136.1
182.4
238.4
108.8
119
161.9

145.5277778	Mean Average

The computer calculated the mean average weight, but where should we round it? Since the original data has one number to the right of the decimal, we will round the mean average to two numbers to the right of the decimal. In this case that is the "2". The number next to the "2" is a seven, so we will round up and make the "2" a "3".

Mean Average Weight ≈ 145.53 pounds

Problems

Try the following proportion rounding problems. Remember to round proportions to the third number to the right of the decimal (thousandths place).

1. Round the proportion 0.986114 to the thousandths place.
2. Round the proportion 0.043882 to the thousandths place.
3. Round the proportion 0.004219 to the thousandths place.

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4. Round the proportion 0.289551 to the thousandths place.

Try the following percentage rounding problems. Remember to round percentages to the first number to the right of the decimal (tenths place).

5. Round 62.83491% to the tenths place.

6. Round 3.68414% to the tenths place.

7. Round 0.71996% to the tenths place.

8. Round 38.977125% to the tenths place.

Round the following statistics to the correct place value.

9. Standard Deviation = 3.8147912 thousand people

(The original data set was rounded to the hundredths place and had two numbers to the right of the decimal.)

10. Mean = 157.3899917 milligrams

(The original data was rounded to the ones place and had no numbers to the right of the decimal)

11. Median = 68.42883 pounds

(The original data set was rounded to the tenths place and had one numbers to the right of the decimal.)

12. Interquartile Range = 7.8379216 centimeters

(The original data was rounded to the thousandths place and had three numbers to the right of the decimal)