



Percentage of Recyclers The Day of Rapid Transit Lesson III



Objective:

Students will create their own statistics about recycling in their classroom.

Grade Levels: 6 – 8 (middle school); 9 – 12 (high school)

Subjects:

- 6th grade – (Earth Science) Resources, Investigation & Experimentation, Number Sense, Statistics, Data Analysis, & Probability, and Mathematical Reasoning
- 7th grade – Investigation & Experimentation, Number Sense, and Mathematical Reasoning
- High School – Ecology, Investigation & Experimentation, and Algebra

California Science Standards:

6th Grade:

- Resources 6b
- Investigation & Experimentation 7b

7th Grade:

- Investigation & Experimentation 7a

High School:

- Ecology 6b
- Investigation & Experimentation 1a & 1m

California Math Standards:

6th Grade:

- Number Sense 1.4
- Statistics, Data Analysis, & Probability 2.1
- Mathematical Reasoning 2.7 & 3.3

7th Grade:

- Number Sense 1.3 & 1.6
- Mathematical Reasoning 1.0 & 2.8

High School:

- Algebra 12.0 & 15.0

Materials:

- Pencil and photocopies of this sheet.



Procedure:

1. Students should count up the number of students attending their class today.
2. The teacher should ask students how many of their families recycle plastic bottles, aluminum cans, and/or newspapers (paper) at home. The teacher can manipulate the question so that less than all or more than zero of the students raise their hand in answer to the question.
3. Students should count the number of hands raised who say their families recycle at home.
4. Students should follow the steps below to express that information in terms of a percent.

Step 1:

Write the number of students in class today _____

Step 2:

Write the number of students whose families recycle _____

Step 3:

Express this data as a fraction (with a numerator above the divide sign and a denominator below the divide sign):

Number of students whose families recycle
_____ = _____
Number of students in class today

Step 4:

Using a calculator or long division, divide the numerator by the denominator. Be sure and divide the top of the fraction by the bottom of the fraction. Your answer should be a number less than 1.0 if you do this correctly. The decimal number that is equal to this fraction is _____. (You can drop numbers after three places to the right of the decimal as a close enough approximation.)

Step 5:

Multiply this answer by 100 to express it as a percent (which is the same thing as moving the decimal two places to the right).

_____ % of all students' families in our class recycle.

Remember the number percent in your answer is defined as the number of students' families out of every one hundred students' families who recycle, using your class as an indicator.



Step 6:

Convert this percent back to a decimal. To do this, drop the percent sign and multiply this number by 0.01. This is the same thing as moving the decimal two places to the left. _____ is the decimal value of the percent of our class whose families recycle. (This should be same decimal value you got in Step 4.)

Step 7:

What do percentages tell us? How are percentages used? Knowing what percent of the students' families in your class recycle, you can compute how many students' families recycle even if you did not know the number of students who raised their hand in Step 2.

Multiply the number of students in class today by the decimal value of the percent of students in the class whose families recycle to find the number of students whose families recycle:

$\text{Number of Students in the Class} \times \text{Decimal Value of Percent Who Recycle} = \text{Number of Students Who Recycle}$

Try it using a calculator!

$$\text{_____} \times \text{_____} = \text{_____}$$

Place answer to Step 1 here Place Answer to Step 6 here

Your answer should be the number of students in your class who said their families recycle or the answer to Step 2.

Note: Working with percents allows you to do computations with the data about recycling in your class and express that data to the larger world in a meaningful way!

