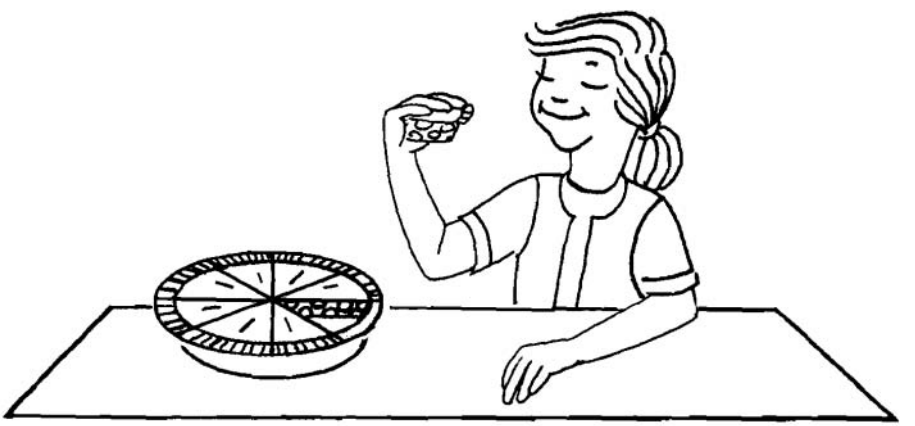
1

Fractions

Purpose To write fractions.

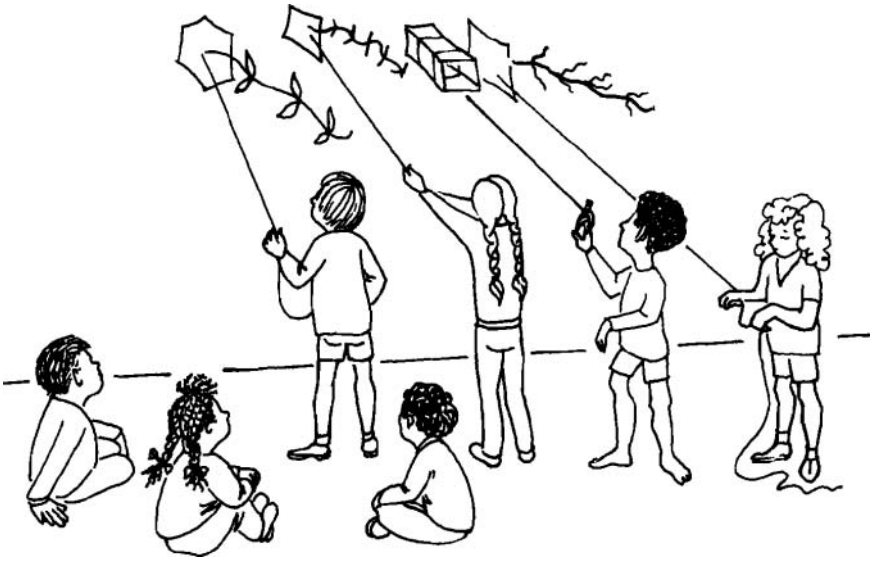
Facts A fraction tells how many parts are in the whole and refers to a part of the total.



The pie is divided into 8 equal parts. Sue is eating one of the pie pieces. 1/8 is the fraction that tells what part of the pie Sue is eating. When you read a fraction, say the top number first and then the bottom number. 1/8 is read as one-eighth.

The top number of a fraction is called the **numerator** and tells how many of the equal parts of the whole are being considered. The bottom number is called the **denominator** and tells the total number of equal parts in the whole.

$$\frac{1}{8} = \frac{\text{numerator}}{\text{denominator}} = \frac{\text{Pieces of pie being eaten}}{\text{Total number of pie pieces}}$$



2. a. What fraction of the children are flying kites?
   b. What fraction of the children are sitting?

Activity: HALF-LIFE

Purpose To demonstrate how radioactive materials change.

Materials

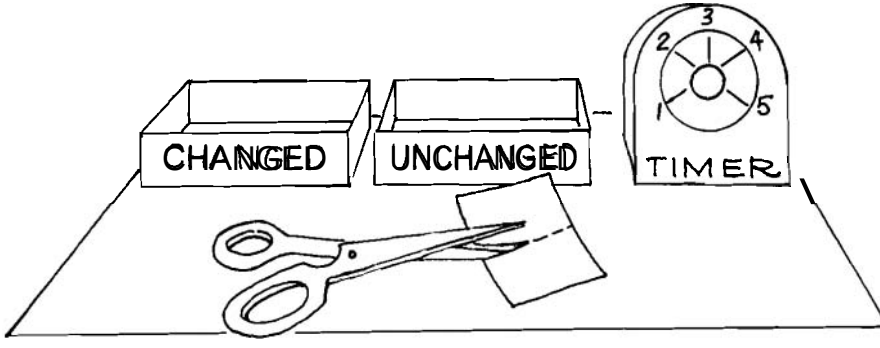
typing paper	marking pen
2 empty shoe boxes	scissors
timer	

Procedure

- Use the marking pen to label one shoe box Changed and the other box Unchanged.
- Use the scissors to cut the sheet of paper in half.

  Place one of the paper halves in the box marked Unchanged.

  Place the second half piece of paper in the Changed box. All papers placed in the Changed box are to be left there, undisturbed, throughout the experiment.



- Set the timer for 1 minute.
- At the end of 1 minute, remove the paper from the Unchanged box and cut it in half.
- Separate the resulting pieces as before, placing one in the Changed box and one in the Unchanged box.

  Again set the timer for 1 minute.
- Continue to cut the piece of paper in the Unchanged box in half at the end of each minute until the paper becomes too small to cut. Always place one of the halves in the Changed box and the other in the unchanged box.

Results At the end of 1 minute, 1/2 of the material was placed in the Changed box to demonstrate the changing that occurs in radioactive materials. The passing of another minute results in placing 1/2 of the remaining material in the Changed box, leaving only 1/4 of the original material unchanged. At the end of 3 minutes, 1/8 of the original material is left. The time it takes for half of a radioactive material to change is called its half-life. The half-life in this activity was thus 1 minute. It takes 10 to 12 minutes for the paper to become too small to cut. The paper pieces build up in the Changed box, but the pieces of paper in the Unchanged box get smaller as time passes. With enough time all radioactive materials will change, but for many of these materials it takes thousands of years for the change to occur.

We have created a simplified model to illustrate a complex topic—radioactivity.

Did You Know?

The half-life of plutonium-239, found in nuclear waste, is 24,000 years. At the end of 24,000 years, 1/2 of all the stored radioactive plutonium-239 changes, but 1/2 of the material remains unchanged. The used fuel rods from nuclear reactors containing plutonium-239 that are stored remain harmful for many thousands of years.

Solutions

1. a. *Think!* How many children are skating? 3
How many children are present? 5
3 of the 5 children are skating.

Answer 3/5 of the children are skating.

b. *Think!* How many children are playing marbles? 2
How many children are present? 5
2 of the 5 children are playing marbles.

Answer 2/5 of the children are playing marbles.

2. a. *Think!* How many of the children are flying kites? 4
How many children are present? 7
4 of the 7 children are flying kites.

Answer 4/7 of the children are flying kites.

b. *Think!* How many of the children are sitting? 3
How many children are present? 7
3 of the 7 children are sitting.

Answer 3/7 of the children are sitting.