79 The Kaleidoscope

Purpose

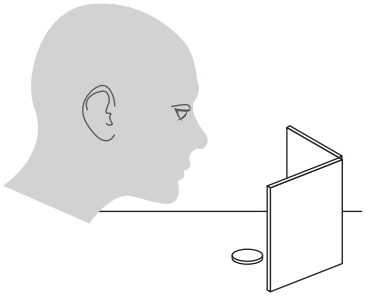
To apply the concept of reflection to a mirror system with multiple reflections

Required Equipment/Supplies

2 plane mirrors, 4 in. × 5 in.
transparent tape
clay
viewing object
protractor
toy kaleidoscope (optional)

Discussion

Have you ever held a mirror in front of you and another mirror in back of you in order to see the back of your head? Did what you saw surprise you?



Procedure

Step 1: Hinge the two mirrors together with transparent tape to allow them to open at various angles. Use clay and a protractor to hold the two mirrors at an angle of 72°. Place the object to be observed inside the angled mirrors. Count the number of images resulting from this system and record in Data Table A.

Step 2: Reduce the angle of the mirrors by 5 degrees at a time, and count the number of images at each angle. Record your findings in Data Table A.

Step 3: Study and observe the operation of a toy kaleidoscope, if one is available.

Angle	Number of Images
72°	
67°	
62°	
57°	
52°	
47°	
42°	
37°	
32°	
27°	

Data Table A

Analysis

1. Explain the reason for the multiple images you have observed.

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Activity

2. What effect does the angle between the mirrors have on the number of images?

3. Using the information you have gained, explain the construction and operation of a toy kaleidoscope.