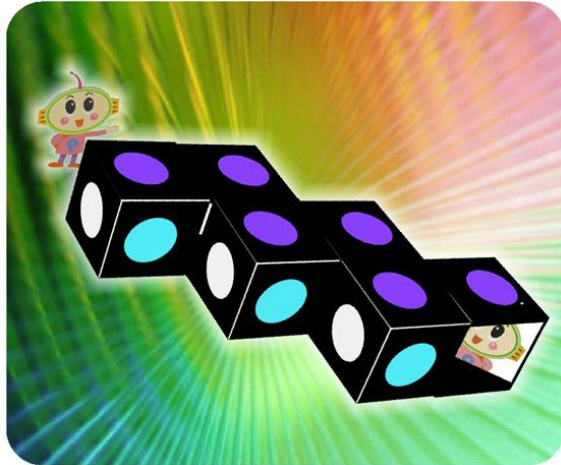


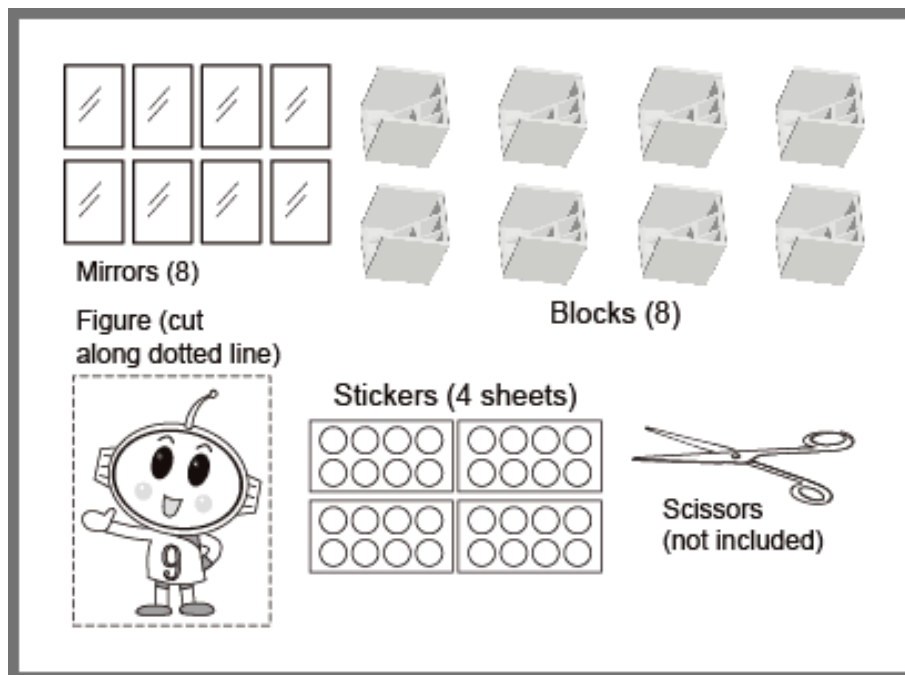
Assembly Instructions and Experiments

GOALS

- Understand that mirrors reflect light.
- Predict how an object is orientated in a combination of mirrors.



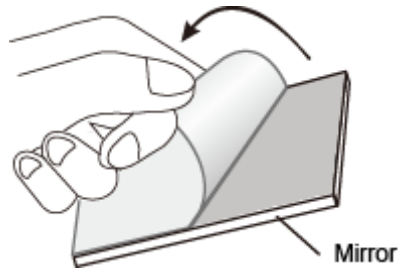
THINGS YOU WILL NEED



HOW TO ASSEMBLE

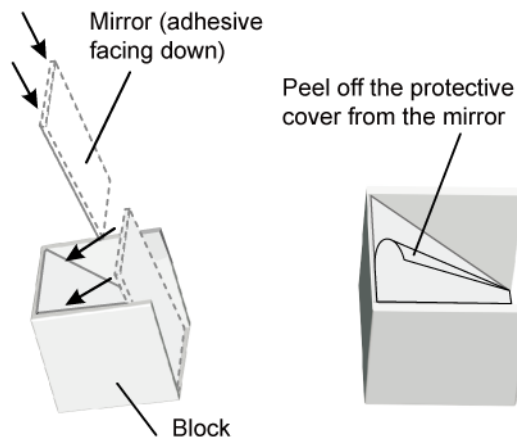
Step 1

Peel off the cover from the back of a mirror, exposing the adhesive backing.



Step 2

Insert the mirror fully into a block, with the adhesive facing down. Press the mirror firmly onto the slope. Peel off the cover from the front of the mirror.



Step 3

Repeat steps 1 and 2 for the remaining seven mirrors.

HOW TO OPERATE

Cut out the doll with scissors.



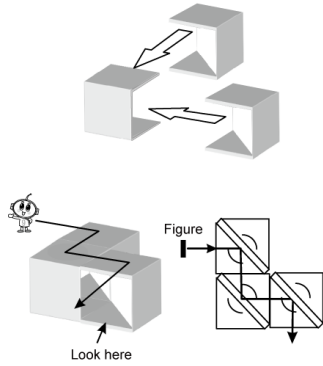
Before starting the experiments, we should understand a little about mirrors. Mirrors are objects with a surface smooth enough to reflect light in a way that forms a clear image. They are often made of polished glass with a reflective coating (such as mercury) applied to the back. The glass protects the coating from damage.

The angle that light hits the mirror, called the angle of incidence, and the angle that light reflects off the mirror, called the angle of reflection, are equal.

<p>1</p> <p>Position the figure to one side of the block as shown, facing the block. Look at the figure's reflection in the mirror.</p> <p>What does the image in the mirror look like?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(A)</p> </div> <div style="text-align: center;"> <p>(B)</p> </div> <div style="text-align: center;"> <p>(C)</p> </div> </div>	<p>2</p> <p>Combine two blocks and position the figure as shown. Look at the figure's reflection in the mirror.</p> <p>What does the image in the mirror look like?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(A)</p> </div> <div style="text-align: center;"> <p>(B)</p> </div> <div style="text-align: center;"> <p>(C)</p> </div> </div>
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3

Combine three blocks and position the figure as shown. Look at the figure's reflection in the mirror.

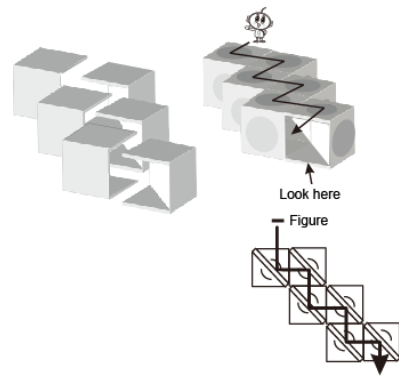


What does the image in the mirror look like?



4

Combine six blocks and position the figure as shown. Look at the figure's reflection in the mirror.

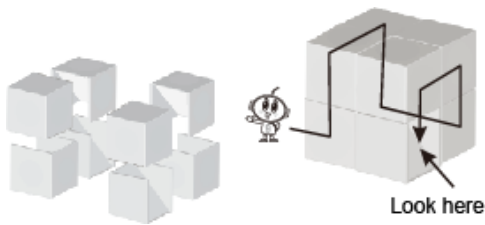


What does the image in the mirror look like?

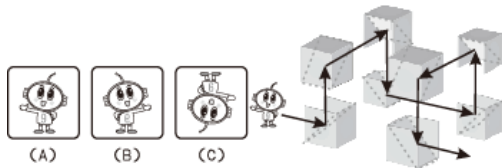


5

Combine eight blocks and position the figure as shown. Look at the figure's reflection in the mirror.



What does the image in the mirror look like?



6

Choose a sticker color and apply the stickers to the left and right sides of four blocks.



Assemble the four blocks as shown (note the way the mirrors slope). Look from above, and you will see an image of a sticker in each mirror.



Use other sticker colors and experiment with the blocks as you like. See if you can predict what the figure's image in the mirror will look like.

The answers to the experiments are: (1) A, (2) A, (3) B, (4) A, (5) A.

EXPLAINING THE CONCEPT

The image we see in a flat mirror is called a virtual image. It seems like the image is actually behind the mirror, so that the distance of an object to its perceived image is twice the distance of the object to the mirror. The object in the mirror still appears to be the same size as the original.

In the first experiment, with a single mirror, the image is flipped so that the figure reaches out with its left hand. In the second experiment, with two mirrors, the image is flipped twice so that the figure reaches out with its right hand. Can you guess what happens in the third experiment, with three mirrors? The image is flipped three times so that the figure reaches out with its left hand.

See if you can assemble complex puzzles where the image is not only flipped, but also rotated. Can you predict what the image will look like?

NOTES

1. Make sure the blocks are oriented correctly in the experiments.
2. Make sure the experiments are conducted in a well-lit area so you can see the reflection clearly.

CAUTION

1. To avoid the risk of choking, do not swallow any parts.
2. To prevent eye damage, do not reflect light from the mirror at anyone's face.
3. Mirrors break easily and the shards may cut. Handle them carefully.
4. Avoid touching the surface of the mirrors to keep them free of oil and dirt.