

## Hands-On Activity 1

In this Activity, you will make animation frames using index cards.

**Step 1** Arrange ten index cards in a pile. On the top card, draw a circle at the top right hand corner.



**Step 2** On the next card, draw the same circle slightly down and to the left.



**Step 3** Repeat this for three or four more cards until your circle is at the bottom of the card. Use the remainder of the cards to draw the circle up and to the left.



**Step 4** Place a rubber band around the stack, hold the stack at the rubber band, and flip the cards from front to back.



Describe what you see when you flip the cards from front to back.

**Sample answer: The circle moving is like a ball bouncing on the ground.**

Look at the circles on the first and second cards and then the second and third cards. How would you describe the change in the position of the circle from one card to the next?

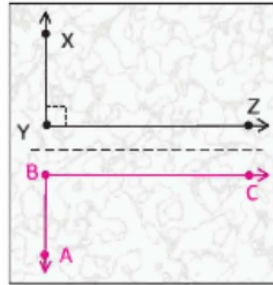
**Sample answer: The circle moved  $\frac{1}{4}$  inch down and  $\frac{1}{4}$  inch to the left.**

Did the shape or size of the circle change when you moved it? If yes, describe the change. **no**



## Hands-On Activity 2

- Step 1** Draw right angle  $XYZ$  on a piece of tracing paper. Place a dashed line on the paper as shown.



- Step 2** Fold the paper along the dashed line. Trace the angle onto the folded portion of the paper. Unfold and label the angle  $ABC$  so that  $A$  matches up with  $X$ ,  $B$  matches up with  $Y$ , and  $C$  matches up with  $Z$ . Tape the paper to your book.

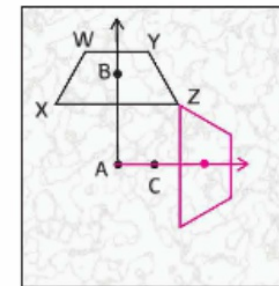
Use a protractor to find the measure of  $\angle XYZ$  and  $\angle ABC$ . Did the measure of the angle change after the flip? **90°; 90°; no**

Use a centimeter ruler to measure the shortest distance from  $X$  and  $A$  to the dashed line. Repeat for  $Y$  and  $B$  and for  $Z$  and  $C$ . What do you notice?

**See students' work; Sample answer: The distance from the original image to the dotted line is the same as the distance from the image to the dotted line.**

## Hands-On Activity 3

- Step 1** Place a piece of tracing paper over the trapezoid shown. Copy the trapezoid. Draw points  $A$ ,  $B$ , and  $C$ . Draw  $\overrightarrow{AB}$ .



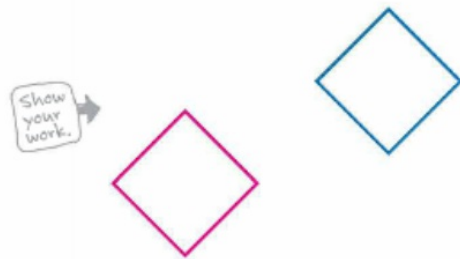
- Step 2** Place the eraser end of your pencil on  $A$ . Turn the tracing paper until  $\overrightarrow{AB}$  passes through  $C$ . Tape the paper to your book.

Did the shape of the trapezoid change when you moved it? If yes, describe the change. **no**

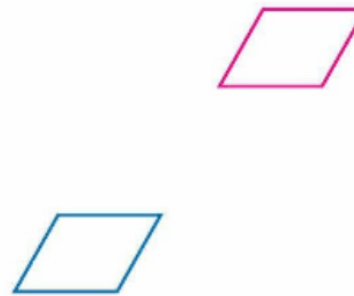
Did the size of the trapezoid change when you moved it? If yes, describe the change. **no**

**Work with a partner. Use a ruler to draw the image when each figure is moved as directed.**

1.  $\frac{1}{2}$  inch down and 1 inch to the left.



2. 1 inch up and 1 inch to the right.

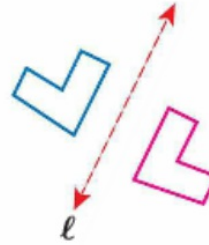


**Draw the image when each figure is flipped over line  $\ell$ .**

3.

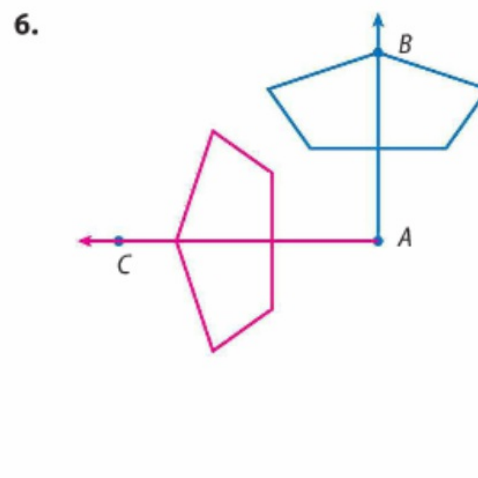
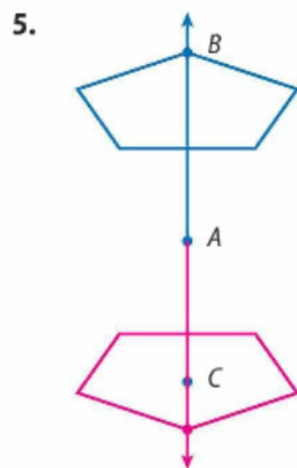


4.



**Draw the image when each pentagon is turned until  $\overrightarrow{AB}$  passes through C.**

Draw the image when each pentagon is turned until  $\overrightarrow{AB}$  passes through C.



7. Refer to Exercises 1–6.

a. For which exercises, if any, did the size of the original figure change?

**none**

b. For which exercises, if any, did the shape of the original figure change?

**none**

c. For which exercises, if any, did the orientation of the original figure change?

**Exercises 3, 4, 5, and 6**