

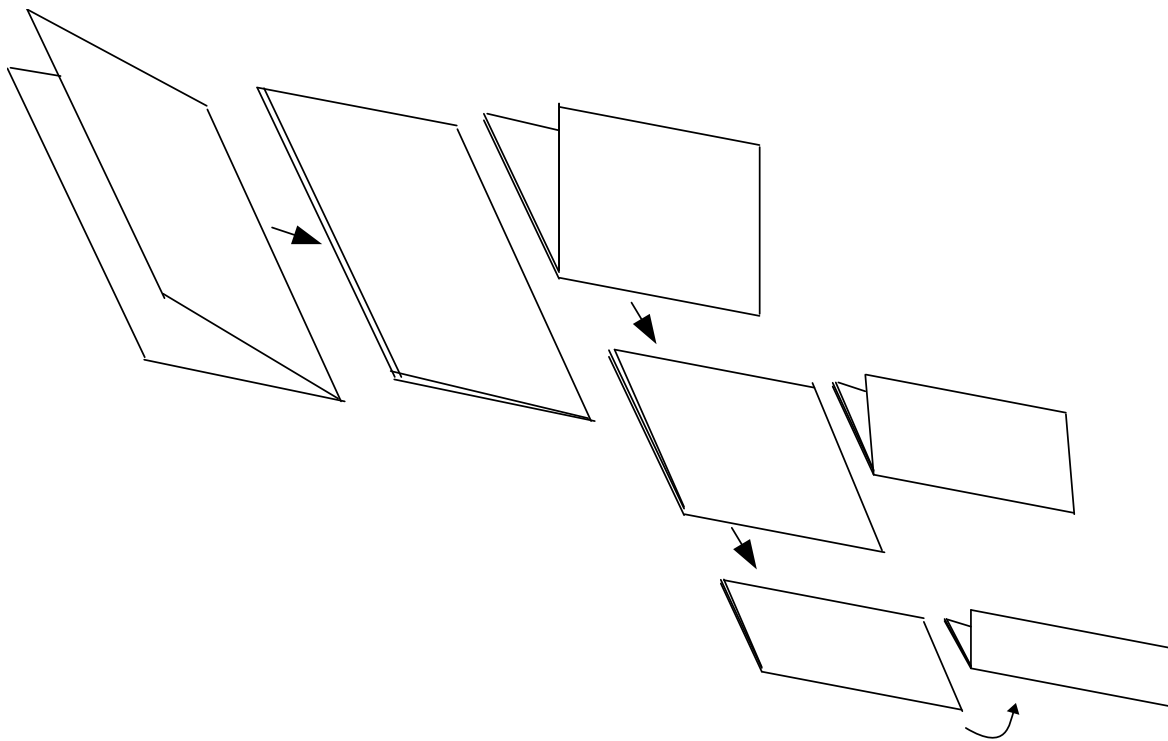
# Stepping Through Paper

**Overview:** Did you know that you can step through a sheet of paper using only a pair of scissors to help? Does this sound impossible? Great – let’s get started.

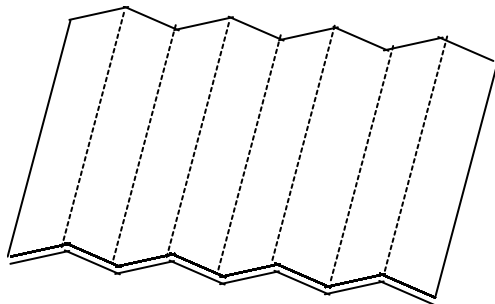
## Materials

- A sheet of paper
- A pair of scissors

**Activity:** The first thing you need to do is fold your sheet of paper into two equal parts in a “hot dog” fold so it’s 11” x 4.25”. Now fold it again in half to have a quarter of the sheet of paper. Continue to fold to the smallest size as possible as shown in the figure below. (You’ll probably want to watch the video for this part.)

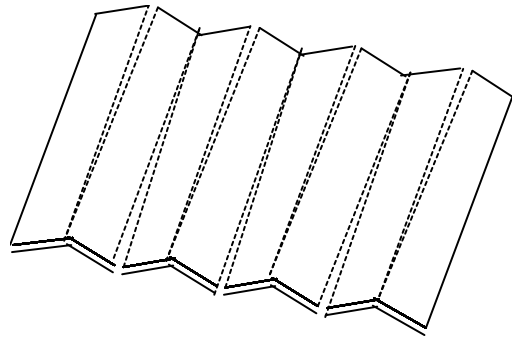


Unfold the paper to get this shape:

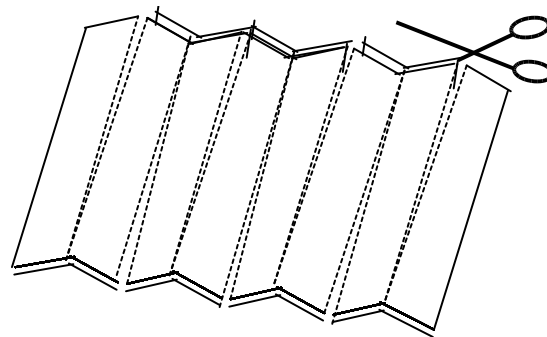


Next, use the pair of scissors to cut the folded side of the paper along the folds. **IMPORTANT!** Cut every other fold as shown in the video. Be careful not to cut all the way through! Leave the ends uncut as shown below:

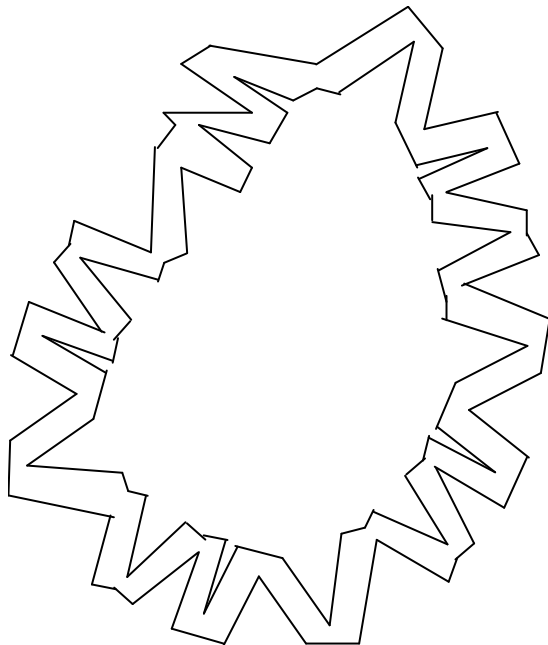
Next we cut the skipped folds from the opposite side as shown in the figure below. Again, don't cut all the way through!



Now cut the folded sides as shown below. Do not cut the first and the last folds!

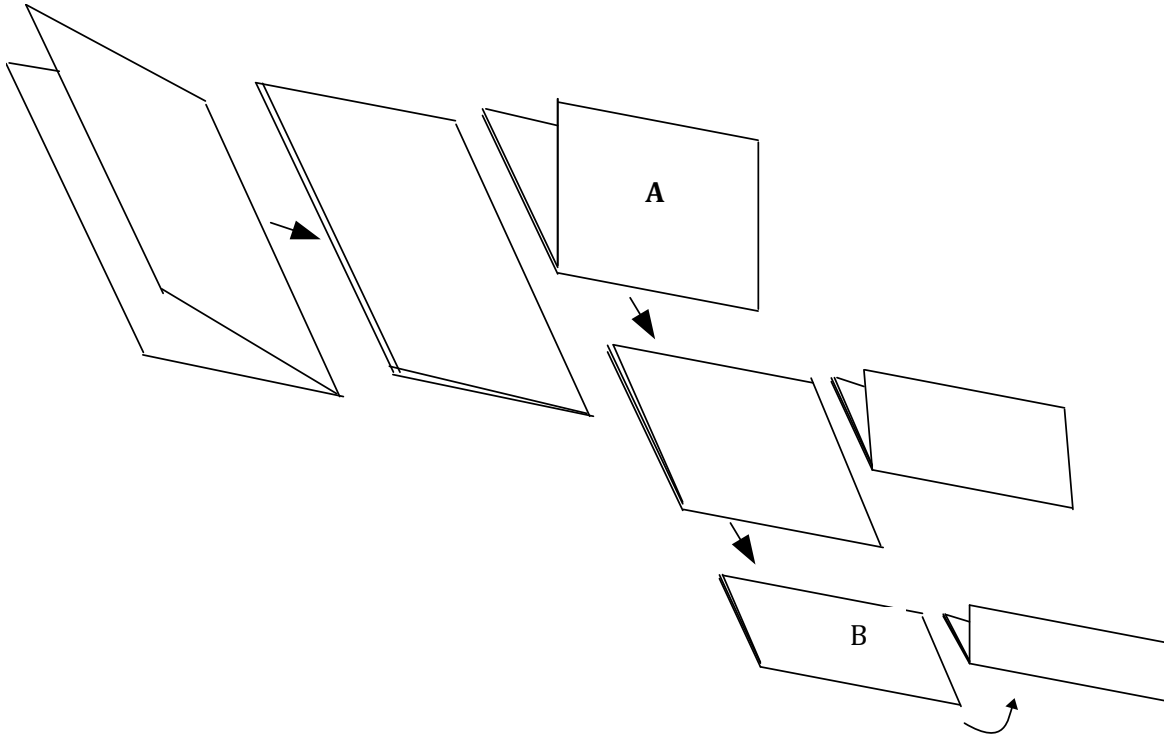


After the process, we come up with a connected strip of paper as shown below. Depending of the thickness of the folding, we can come up with a long strip that's big enough to step through!

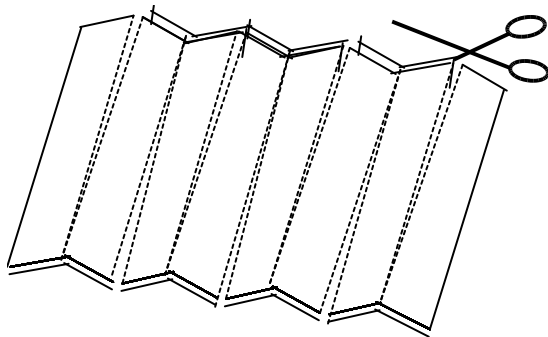
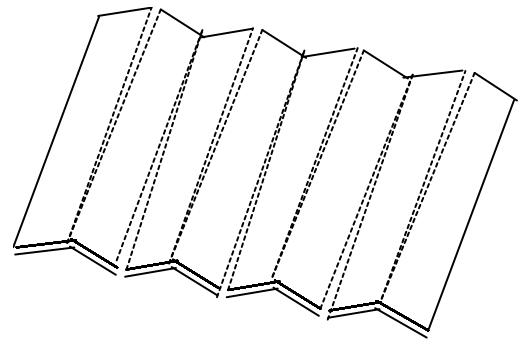


## Exercises

Use the diagram below to answer questions 1 to 6



1. How many folds are made according to the following diagrams?
2. What fraction of the paper is visible after the first fold?
3. What fraction of the paper is visible after the fourth fold?
4. What fraction of the paper is visible after the second fold?
5. How many fold lines does A have?
6. How many fold lines does B have?
7. In the second to last process, why don't we want to cut the first and the last folds?
8. If the paper shown in the figure to the right was to be cut end to end along the folds, how many smaller pieces of paper would result?
9. If the paper shown in the figure below was to be cut end to end



along the folds then cut by the scissors as shown below, how many smaller pieces of paper would result?

## Answers to Exercises: Stepping through a sheet of paper

1. 4
2.  $\frac{1}{2}$
3.  $\frac{1}{16}$
4.  $\frac{1}{4}$
5. 2
6. 4
7. To keep the strip connected (closed)
8. 8
9. 16