

Folding

Work with 1 or 2 other students, and choose one of your group as the recorder. The recorder should keep a written record of his/her group's discussion of the problem below, and you may use this in writing an account of this problem-solving session. Use the following headings to organize the discussion:

- Understand the problem.
- Devise a plan.
- Carry out the plan.
- Look back.
- Acknowledge when, and how, you're stuck.

Take a strip of paper and stretch it so that you have one end between your left thumb and index finger and the other between your right thumb and forefinger. Fold the strip so that the left end is on top of the right end. Repeat this several times, each time folding so that the left end is on top of the right end of the strip.

When you're done, keep holding the right end and unfold the entire strip. Some of the creases point vertex up, some down. Can you predict the sequence of ups and downs for any number of times you carry out the folding operation? Can you form a convincing argument that your prediction method is correct?

Can you extend the problem to two dimensions (folding first left over right, then back over front, then left over right...)?

You can continue working on this problem at:

https://wwwcgi.cdf.toronto.edu/~heap/cgi-bin/Solvent/wiki.pl?Problem_Solving_Home_Page/PaperFolding
Userid: sleuth
Password: eureka

HINT 1, THINK RECURSIVELY: Suppose you knew the pattern produced by 4 folds. How could you use this in finding the pattern produced by 5 folds? Is one pattern somehow “contained” in the other?

HINT 2, THINK SYMMETRICALLY: Where does your first fold occur in the overall pattern of folds? Does this suggest a way to organize fold patterns?