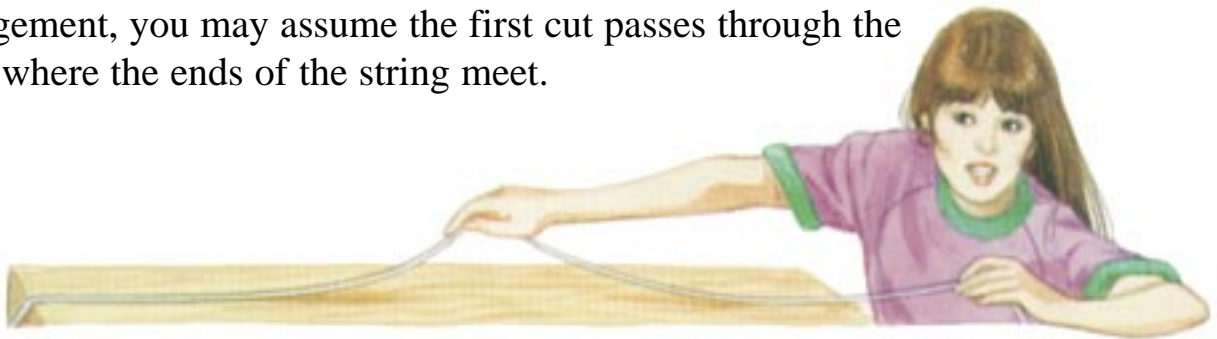


## The Problem

Susan has a very long piece of string. She wants to cut it into pieces, and she wonders whether the way the string is laid out will affect the number of pieces she will get. She is considering laying the piece in a straight line (—), in a circle (O), in a half circle (C), or in the shape of an S. Each cut Susan makes will be a vertical cut across the shape she makes, and it will be parallel to the other cuts. If she does not care about the size of the pieces, how many pieces will be made from each configuration when she makes 100 cuts in each? For the circle arrangement, you may assume the first cut passes through the point where the ends of the string meet.



## Strategies and Hints

1. Think about making the problem simpler. What if Susan makes fewer than 100 cuts?
2. Record what you know in a table.
3. Do you see patterns in the numbers in the table(s)? Can you express these patterns in general, using a variable?

## Extensions

1. Can the same number of pieces be made from both a line arrangement and from a circular arrangement? Why or why not?
2. If you want to make exactly 31 pieces, which arrangement(s) could you use? Which one(s) could you not use?