

Color Triangle Challenge

The Rules

If the two dots above are the same color, then the third dot below matches both. If the two dots above are different colors, then the third one below is different from either.



The Challenge

Take a row of ten dots colored as follows, and place a row of nine dots underneath it, coloring them according to our rule. Continue with eight dots underneath that and so on, all the way to a single dot.



What will be the color of that final dot?



The challenge above is hard. Here are some ways to make it easier.

1. Make a colored row three dots long. Can you predict what the final dot will be if you know the top three dots? Is there a pattern or shortcut? Figure out all the possibilities for three dots.
2. Make a colored row four dots long. Can you predict what the final dot will be if you know the top three dots? Is there a pattern or shortcut? Figure out all the possibilities for four dots.
3. Start with just two colors. Can you predict what will happen if your row is all blues with a red at the end? What about all blues with two reds at the end?
4. Consider the four dot rows again. What kind of simplifying patterns can you find?
5. Try making starting rows with five, six, and seven dots. Can your simplifying patterns help you predict what will happen?
6. Try the original challenge with ten dots again. Can you predict what the final dot will be?
7. What happens if we start with 28 dots?

