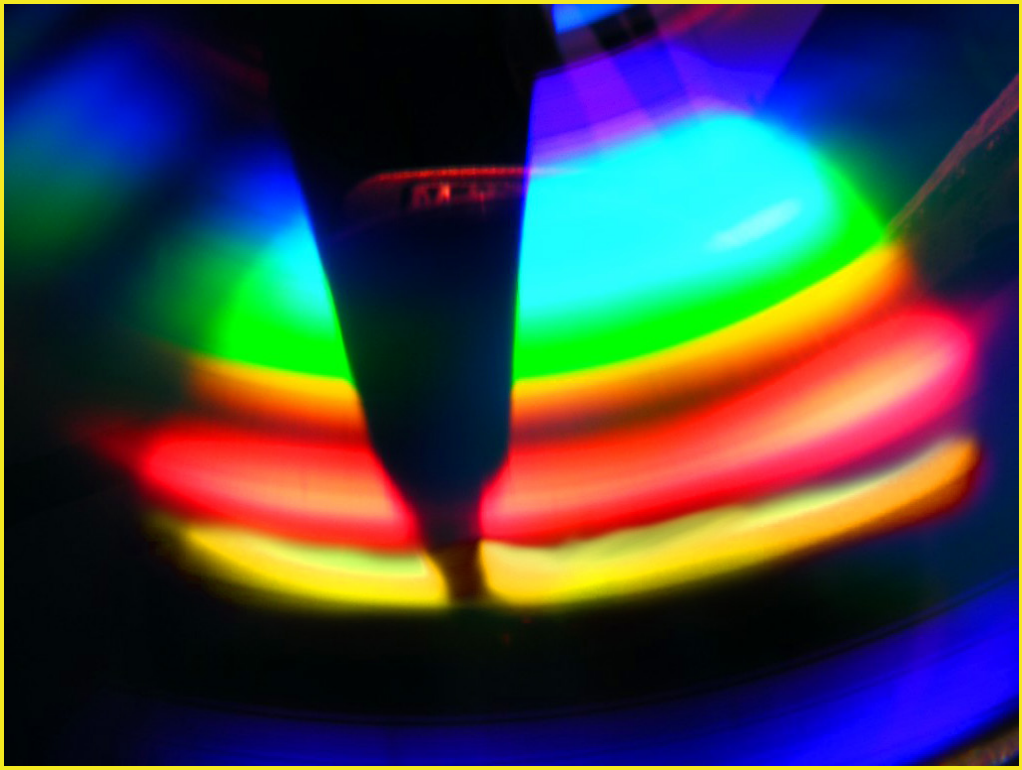
STEM Sims™

Map Coloring



Map Coloring

Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.

Start learning right now about map coloring. Take the following brief quiz to see how much you already know about this topic. See the bottom of page 4 to check your answers.

1. Imagine that you're the head of a company that makes color maps of the United States. You want to make sure that no two adjoining states on the map are represented by the same color. What is the minimum number of different colors you'll need to print the map in color?
   a. 3
   b. 4
   c. 5
   d. 6

2. A map is a visual representation that shows the relationship between the values of two things.
   a. true
   b. false

3. Maps can be changed into planar graphs.
   a. true
   b. false

4. What does a red label on a chemical bottle indicate about the substance?
   a. the substance is an oxidizer
   b. the substance is a reducer
   c. the substance is flammable
   d. the substance is a biohazard

5. The best method for storing chemicals in a supply room is to use an alphabetized system.
   a. true
   b. false

How Many Colors?

For each figure below, state the minimum number of colors that are required to color each figure so that no two adjoining sections have the same color. Check your answers on the bottom of page 4.

Figure 1

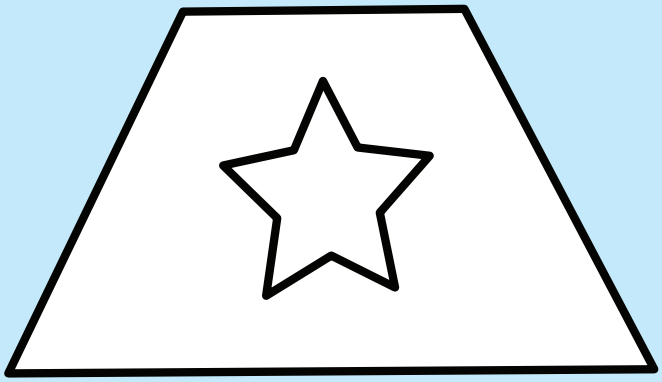


Figure 2

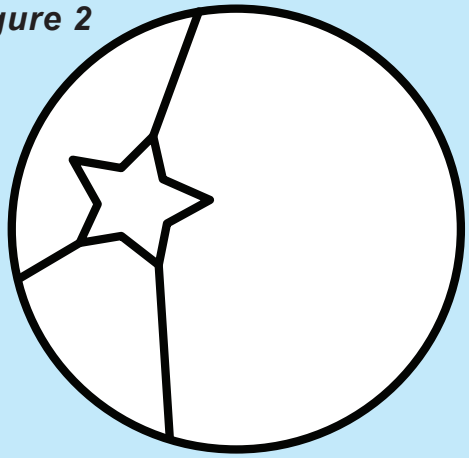


Figure 3

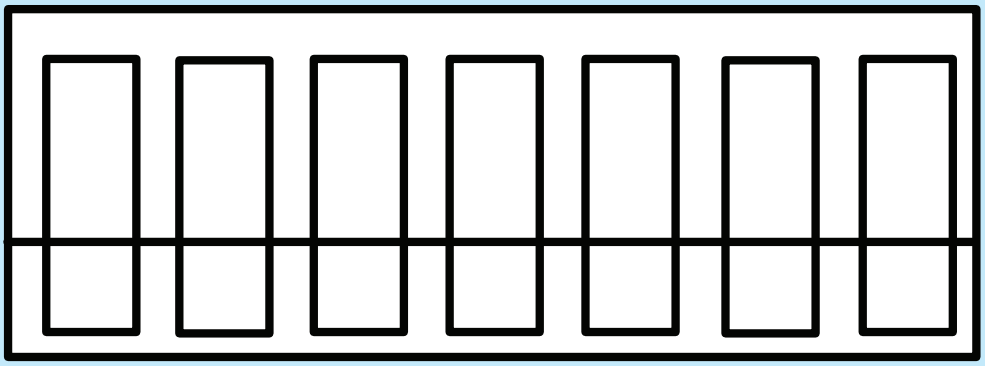
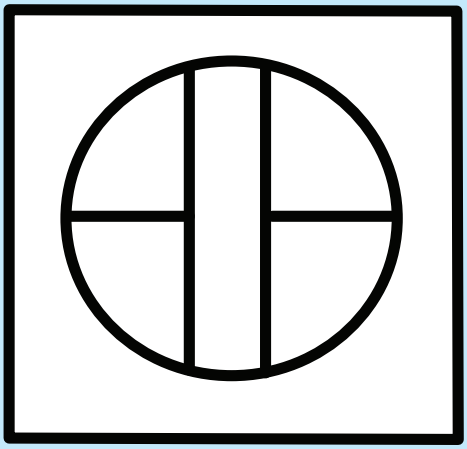


Figure 4



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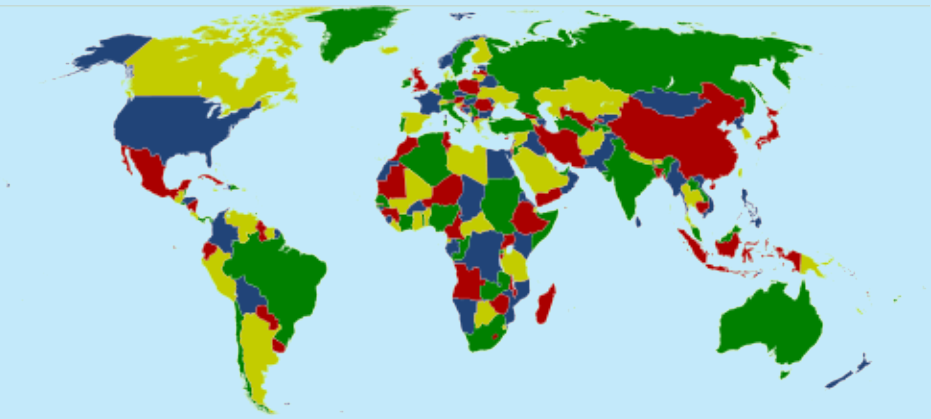
The Cube

Solving the Rubik's Cube is a classic color and patterning exercise. The 3 × 3 × 3 Cube has 2,125,922,464,947,725,402,112,000 possible permutations. This means that the 26 individual cubelets that make up the Cube can be positioned in 2.1×10^{24} different ways.

However, the scrambled Cube can be solved in as few as 20 moves. The 2011 world's record time for solving the Cube is 5.66 seconds. World championships in solving the Rubik's Cube have been sanctioned in a number of areas, including: solving the Cube blindfolded, solving the Cube underwater, and solving the Cube with a single hand and using only one's feet.



Please visit the following webpages for more helpful information:

STEMsims.com

http://www.DiscreteTeaching.com

Answers: **Page 2 Answers:** 1) b. 2) b. 3) a. 4) c. 5) b. **Page 3 Answers:** 1) two. 2) four. 3) two. 4) four.

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