Paint My Counties, Discretely
Students learn the counties of Arizona through map coloring and math.
(Adapted from Rutgers Discrete Math)

<table>
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<tr>
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<td>Grade Level</td>
<td>4-5</td>
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<tr>
<td>Duration</td>
<td>2 class periods</td>
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**National Geography Standards**

**ELEMENT ONE: THE WORLD IN SPATIAL TERMS**

1. How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

**Arizona Geography Strand 4**

**CONCEPT 1**

**World in Spatial Terms**

GRADE 4

PO 7 Locate physical and human features in Arizona using maps, illustrations, or images.

**CONCEPT 2**

**Places and Regions**

GRADE 5

PO 2 Describe the geographic characteristics of a state in the United States with the assistance of maps, the internet, atlases and other reference materials.

**Arizona Math Standard**

**STRAND 2 Discrete Math**

**CONCEPT 4: Vertex-Edge Graphs**

GRADE 4

PO 1 Color maps with the least number of colors so that no common edges share the same color (increased complexity throughout grade levels).

GRADE 5

PO 1 Color maps with the least number of colors so that no common edges share the same color (increased complexity throughout grade levels).

**Overview**

This lesson increases students’ knowledge of the counties through a map coloring activity. Map coloring is connected to graph theory in mathematics.

**Purpose**

Students will learn the 15 Arizona counties while engaging themselves in a problem-solving math activity.

**Materials**

- Arizona Counties map (with county names, 4 maps on one page)
- Colored markers, colored pencils, or crayons.
- 3 blank Map of Arizona Counties map to be used as a test for students to identify each county – one for pretest, one for posttest, and one to use as a study sheet per student
- Overhead or Map of Arizona for students to copy down the counties of Arizona
Paint My Counties, Discretely

Objectives
The student will be able to:

1. Identify the 15 counties of Arizona.

2. Discover that no more than four colors will ever be required to color regions on their maps.

Procedures
First Period
Set: How many counties are there in Arizona

1. Ask the students to locate and name the 15 counties on a blank copy of the Arizona Counties (with no names) map.

2. Distribute Arizona Counties Map worksheets to each student. Students will identify the counties. Each student will have a list of the counties. Write each county map using an overhead projector.

3. Challenge the students to color their maps using the least amount of colors possible. You may not have any counties that border or touch one another along a side the same color. They are to use their practice maps to do this. They may work as individuals, pairs or a team. Encourage them to say the counties as much as possible. The least amount of colors will be four for this map.

4. Students will be asked to name and locate the counties for a posttest using a blank map of the counties of Arizona (teacher decides when this will be).

Assessment
Geography:
Give the students a blank map of Arizona and have them write the name of each county in its space. Mastery is 12/15.

Math:
Give the students a copy of Arizona ZIP code station areas. They must map color using the least amount of colors. Mastery is 6 areas out of 8 areas correctly colored.

Extensions
Choose other maps and map color them. (See maps included on the GeoMath CD.)

Sources
Map Coloring Websites: www.c3.lanl.gov/mega-math/workbk/map/map.html
www.mathmaniacs.org/lessons/15-mapcoloring/

Francis, Richard. The Mathematician’s Coloring Book. 08892652.

Rand McNally website for purchasing playground maps: www.randmcnally.com/