

Paint My Counties: Mapcoloring the Counties of AZ

Author	Sara Jenkins
Grade Level	4
Duration	2 class periods

ELL Adaptation by Denise Dorn and Dennis Rees

National Standards	AZ Standards	Arizona Social Science Standards
GEOGRAPHY Element 1: The World in Spatial Terms 1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information.	ELA Writing Production and Distribution of Writing 3.W.4 With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. Speaking and Listening Presentation of Knowledge and Ideas 4.SL.4 Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive facts to support main ideas or themes; speak clearly at an understandable pace. MATHEMATICS 3.MP.1 Make sense of problems and persevere in solving them.	GEOGRAPHY The use of geographic representations and tools helps individuals understand their world. 3.G1.1 Use and construct maps and graphs to represent changes in Arizona over time. Key concepts include but are not limited to locating physical features including the Grand Canyon, Mogollon Rim, Colorado River, Salt River, Gila River. Key concepts include but are not limited to locating human features including major cities, counties, Hoover Dam, Roosevelt Dam, and state capital. Key concepts include but are not limited to distinct physical and cultural characteristics of Arizona including landforms, the 5C's, climate zones, elevations, plants, animals, Arizona's 22 Indian Nations, diverse ethnic, racial, and religious cultures

SIOP Elements		
Preparation Adapting content Linking to background Linking to past learning Strategies used	Scaffolding Modeling Guided practice Independent practice Comprehensible input	Grouping Option Whole class Small groups Partners Independent
Integrating Processes Reading Writing Speaking Listening	Application Hands on Meaningful Linked to objectives Promotes engagement	Assessment Individual Group Written Oral

Arizona ELP Standards

Stage III

Basic

Reading

Standard 4: The student will analyze text for expression, enjoyment, and response to other related content areas.

The student will demonstrate knowledge at reading comprehension by:

B-21: following two-to-three step written directions to complete task/procedure.

Writing

Standard 1: The student will express his or her thinking and ideas in a variety of writing genres. The student will express his or her thinking and ideas by using a variety of genres, as demonstrated by:

B-7. writing a persuasive statement with instructional support.

Listening /Speaking

Standard 2: The student will express orally his or her own thinking and ideas.

The student will communicate orally by:

B-8. presenting with a group, a variety of oral reports (e.g., expository, cause effect, persuasive, etc.) containing an introduction, body, conclusion and transitions, with instructional support.

Overview

In 1983, Arizona went from 14 counties to 15 with the addition of La Paz County. Mapcoloring is connected to graph theory in mathematics. Combining these geography facts with math skills gives students a chance to use logic to learn the counties.

Purpose

Students will become familiar with the 15 Arizona counties while engaging in a problem-solving math activity. This lesson includes adaptations for diverse learners (ELLs).

Materials

- Unlabeled map of Arizona Counties (4 maps on one page)
<https://geoalliance.asu.edu/sites/default/files/LessonFiles/Jenkins/AzCounties4Unlabeled.pdf>
- Labeled map of Arizona Counties (4 maps on one page)
<https://geoalliance.asu.edu/sites/default/files/maps/Azcounties-4x.pdf>
- Unlabeled map of Arizona Counties (8.5 x 11)
<https://geoalliance.asu.edu/sites/default/files/maps/AZCOUN-BL.pdf>
- Labeled map of Arizona Counties (8.5 x 11)
<https://geoalliance.asu.edu/sites/default/files/maps/azcounties-names.pdf>
- Colored markers, pencils or crayons
- Arizona County Names sheet
- Arizona Playground Map Cost Estimation Sheet
- Vocabulary Cards

Key Vocabulary

county – an administrative district of a state

border – a political boundary

paint – a liquid that is spread to change the color

touch – to bring something into contact with something else

purchase – to buy

Objectives

The student will be able to:

- identify the 15 counties of Arizona.
- present a persuasive argument to the class.
- use logic to solve a math problem.

Procedures

Note: As you are doing this lesson, try to use the vocabulary of standardized tests, i.e., least and fewest so students become familiar with them.

SESSION ONE

1. Write the social studies content standard on the board: "Learn names and locations of the 15 counties of Arizona." Read this to students.
2. Write the language standard on the boards: "Present a persuasive argument to the class." Read this to students.
3. Write the five key vocabulary words on the classroom board or overhead. Ask students if they can provide a definition for each word. For each word, record correct definitions. Pass out Vocabulary Cards to those students who may

need them. **(Scaffolding: Comprehensible input)**

4. Then ask: *How many counties are there in Arizona?*
5. Ask students if they know any county names in Arizona. Record these on the classroom board. Finish the list of counties and label the list: "Word Bank." Have students orally rehearse each county name. (Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai, Yuma) **(Preparation: Link to past learning; Integrating Processes: Speaking, listening)**
6. Distribute the County Names sheet to students and the unlabeled map of Arizona Counties (all four maps) to each student. As a pretest, ask the students to locate and write the names of the 15 counties of Arizona on the first map. **(Preparation: Link to past learning)**
7. Project the labeled version of the map. Have students correctly label (re-label) their pretest map. This will be their study sheet. **(Application: Linked to objectives)**
8. Issue a challenge to the students. A) They are to color their maps using the least amount of colors possible. B) They should not have any counties that are the same color that border or touch one another. C) They are to use their practice maps that are not labeled) to do this. D) They may work as a team. E) Encourage them to say the counties as much as possible. **Note: (Students should find that only 4 colors are needed.)**
9. Project the scenario: *"Your school Student Council wants to purchase paints to paint the state of Arizona and its counties on the school grounds. In order to save money, the Student Council wants to purchase as few colors as possible. You may not have any counties be the same color that border (touch) one another."*
10. Model how some places touch and others don't and what would be the cost of the paint in this situation. **(Scaffolding: Modeling)**
11. Then continue with: *The paint (one bucket per county) prices are: \$3.00 for one color, \$6.00 for second color, \$9.00 for third color, \$12.00 for fourth color, for \$15.00 fifth color, and \$18.00 for sixth color*
12. *You may choose the colors. The lowest cost wins the contract. How low can you go?"*
13. Put student in small groups. Give each group colored pencils or markers. Instruct groups to use the remaining 3 maps on their paper for solving the problem. Keep projecting the scenario so students can recall what they are supposed to do. **(Grouping: Small groups,**

Application: Hands on, Scaffolding: Comprehensible input).

SESSION TWO

1. Have students review and/or finish their maps made during the previous session.
2. When they have completed their calculations, distribute the Arizona Playground Map Cost Estimate Sheet. Instruct students to record what color each county will be and then compute the cost of that paint bucket. Instruct them to use the Calculation Space for their computations.
3. In the Proposal space, instruct students to write a contract stating the numbers of colors needed and cost. They should write at least one paragraph on the back of the paper to persuade the student council why they should use their services. Tell groups that their proposal will be graded using the Six-Trait Writing Rubric for the presentation assessing Voice. Did they use persuasive words? **(Application: Linked to objectives, Assessment: Group)**
4. Have students present their map designs, contract information, and paragraph to the class. **(Integrated Processes: Speaking, Writing, Listening; Application: Linked to objectives)**
5. Have class vote on which design to suggest to the student council. Discuss how the class has contributed to their school and how voting was important to making a decision.

Assessment

ELA

Use the Six-Trait Writing Rubric to assess the group's paragraph focusing on Ideas/Content and the group's presentation focusing on Voice. Each member of the group should contribute and therefore earn the same grade. Mastery will be 4 or higher on the rubric.

Geography

Give each student a blank map of Arizona and have he/she write the name of each county in its correct location. Mastery will be seen as labeling at least 12 counties correctly.

Mathematics

The Arizona Playground Map Cost Estimate Sheet and the group's final map can be graded for completeness and accuracy. Mastery will be seen 80% in correctly computing the cost of the paint.

Extensions

Students could color a map of the 48 contiguous states of the United States in the same manner as the logic problem.

<http://geoalliance.asu.edu/sites/default/files/maps/US-NAMES.pdf>

Sources

Francis, Richard. The Mathematician's Coloring Book. ISBN 08892652.