Paint My Counties: Map Coloring the Counties of AZ
Students learn the counties of Arizona and writing and math too!

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	(Lesson adapted from Rutgers Discrete Math)
Grade Level	4
Duration	2 class periods

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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

TESOL Standards for Grades 4-8

ESL: English For Content Through The Use of ESL Methodologies, The Student Will:
EFC-A. Create, read, and interpret visual information relating to science, social studies and math.
A5. Create visuals to present information.
EFC-D. Communicate clearly using math, science, and social studies target vocabulary.
D1. Prepare and present oral reports.

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 instruction al 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.

ARIZONA
GEOGRAPHIC ALLIANCE

Overview

In 1983, Arizona went from 14 counties to 15 with the addition of La Paz County. Map coloring 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.

Key Vocabulary

county – an administrative district of a state
border – a political boundary
paint – a mixture of pigment and solution (noun); to apply a mixture of pigment and solution to a surface (verb)
touch – to bring something into contact with something else
purchase – to buy

Additional Materials Needed for ELL

- Arizona County Names sheet
- Arizona Playground Map Cost Estimation Sheet
- Vocabulary Cards

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 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. **(Preparation: Link to past learning)**

4. Ask students if they know how many counties are in Arizona. (15). **(Preparation: Link to past learning)**

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. Ask the students to locate and label the 15 counties of Arizona on a blank copy of the Counties of Arizona Map as a pretest. Tell students they may use the word bank on the classroom board or overhead. (You can have the class grade this pre-test by projecting an overhead or computer generated Arizona map that has the counties shown).

7. Put student in small groups. Give each group colored pencils or markers. Distribute Arizona Counties Map with 4 Arizona maps to the page to each student. **(Grouping: Small groups).**

8. Use the Internet to locate and project an example of a playground map, as students look at the image, read the following scenario to the class.
    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, it wants to purchase as few colors as possible. You may not have any counties be the same color that border or touch one another along the side.*

The paint (one bucket per county) prices are: $3.00 one color, $6.00 second color, $9.00 third color, $12.00 fourth color, $15.00 fifth color, $18.00 sixth color

You may choose the colors.

The lowest cost wins the contract. How low can you go?" **(Application: Promotes engagement)**

9. Tell students that before they make a cost estimation, they need to try and color their maps using the least or fewest amount of colors possible. They should not have any counties that are the same color that border or touch one another. You should use a document camera or projected map of Arizona Counties (blank or labeled) to demonstrate what you mean by not coloring two counties that share a border the same color. They should work on

their practice maps in their group, but each individual must attempt to use as few colors as possible. Tell students to read and repeat each county name as they color the county. Tell students to help each group member pronounce the names correctly. (Students should find that only 4 colors are needed.) **(Application: Hands on).**

10. Each group of students will choose one colored map for the next day's activity. They should choose by voting the map with the fewest colors used and has colors that they all like. This voting process is the group's ticket out the door at the end of the period. **(Application: Promotes engagement).**

11. When a group of students has completed the coloring activity, give each child a blank county worksheet and printed list of the county names so they can continue to practice locating and naming the counties. You can assign additional practice as homework, or you can just let this be an in-class activity. **(Scaffolding: Independent practice) (Application: Lined to objectives).**

SESSION TWO
Prerequisite Knowledge: Students should have some experience in writing a persuasive paragraph.

1. Write 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 board: "Present a persuasive argument to the class." Read this to students.

3. As a whole class, but seated with their group, have volunteers come to the overhead or computer generated map to locate and/or label the county map. Allow student group members to prompt each other with answers **before** the student comes to do this. You can vary the task (identify or label) so that Beginning ELL students can provide answers at the oral level. Brainstorm with the whole class that this is a contest and how would you write the paragraph so that yours is chosen by the student council. Discuss words that might persuade the student council to choose you for the project. Write the words on chart paper so students have them to refer to as they write. **(Preparation: Strategy; Scaffolding: Guided practice).**

4. Distribute an Arizona Playground Map Cost Estimate Sheet to each group. Tell students to read the "Mission Statement". Tell students to discuss in their groups how they can use the statement to help calculate the cost of making a playground map.

After a few minutes, have each group share the strategy they will use. **(Scaffolding: Modeling; Integrating Processes: Reading, Speaking, Listening).**

5. Give groups time to work on calculations. Tell groups that you want them to check their math before they move to the next step. When they have completed their calculations, they are to write a contract stating the colors they will use and the cost of the project. As a group, they should write at least a paragraph 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 Ideas/Content, Organization, and Voice. **(Application: Linked to objectives)**

7. When a group completes their proposal, provide additional copies of the county map so students can continue to practice naming and locating the counties. Have group members work in pairs to rehearse/quiz each other on the names and locations of the counties. **(Preparation: Strategy)**

8. When all groups have completed their calculations and proposals, a student from each group should present their results to the class. The class will decide which design to suggest to the student council.

9. Ask students to name and locate the counties for a post-test using a blank map of the Counties of Arizona. **(Application: Linked to objectives).**

Assessment

Writing: Use the Six-Trait Writing Rubric for the presentation assessing Ideas/Content, Organization, and Voice. A 4 or higher will be considered mastery on the rubric.

Geography: Give the students a blank map of Arizona and have them write the name of each county in its space. Students should be able to identify at least 80% of the counties. ELL students can be assessed orally or using a numbered word bank, they would put the correct number in each county.

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

▪ Students could choose another state and map color its counties.

• Make or order templates from various sources and make your school a playground map. Some sources are:

https://peacefulplaygrounds.com/product/catalog/u-s-playgroundmap-stencil/

http://www.worldmapsonline.com/map-stencils.htm

https://kaboom.org/resources/enhancement_projects/how_paint_us_and_world_maps

Sources

Use the Internet to show students an example of a playground map. Possible websites include http://www.et-group.com/maps.htm or using any search engine to find examples.