Math With A Map: Natural Characteristics and Related Word Problems

Students learn about some natural characteristics of the United States while practicing solving math word problems.

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**National Geography Standards**

**ELEMENT TWO: PLACES AND REGIONS**

4. The physical and human characteristics of places.

**Arizona Geography Strand**

**CONCEPT 1 World in Spatial Terms**

**Grade 1**

PO 4 Recognize characteristics of physical features

a. physical (i.e., continent, ocean, river, lake, mountains, islands)

**Grade 2**

PO 6. Locate physical and human features using maps, illustrations, images, or globes:

a. physical (i.e., ocean, continent, river, lake, mountain range, coast, sea, desert)

**Other Arizona Standards**

**Mathematics Common Core Standards Operations and Algebraic Thinking**

1.OA.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1.OA.2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

2.OA.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

**Number and Operations in Base Ten**

2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

**Standards for Mathematical Practice**

1.MP.1 and 2.MP.2 Make sense of problems and persevere in solving them.

**Overview**

This lesson gives students exposure to some natural characteristics of the United States, and integrates math word problems related to these natural characteristics or resources.

**Purpose**

In this lesson, students will identify some of the major natural characteristics of the United States including a major mountain range, some of the major bodies of water in and around the United States, and a national forest.
Math With a Map

Materials

- Math with a Map United States map (one for each student, and one made into a transparency)
- Math with a Map United States map Teacher’s Key
- Overhead markers in brown, green, blue, and red
- Crayons in brown, green, blue, and red for each student
- Copies of the questions for each group, or cut apart for individual or partner use
- Blank papers for students to record their solutions to the word problems
- Criteria for scoring Geography and Math

Objectives

The student will be able to:

1. Color and copy some natural characteristics: a mountain range, a forest, the Great Lakes, some rivers, and the oceans on a map of the United States, and create a map key.

2. Use a red “X” to mark the spot where a human activity is likely to occur based on the natural characteristics on the map.

3. Solve word problems using the appropriate operation.

Procedures

Students should have experience with simple classroom or school maps in which map keys are used.

SESSION ONE

1. Start by introducing the map of the United States on the overhead.

2. Briefly discuss where the students’ state is located or have a student point out where his/her state is located on the overhead.

3. Tell them that there are some interesting natural characteristics of the United States that they will be adding to the map.

4. Distribute U.S. maps to students and make sure that each child has a brown, green, blue, and red crayon.

5. Begin the guided mapping by explaining that we use symbols on a map. Sometimes we use small pictures to stand for something much larger.

6. Discuss mountains. Ask children if they have ever seen or been to the mountains. Next ask them what sorts of activities people do in the mountains. List these on the board. The list should include at least: skiing, hiking, and camping.

7. Using a triangle shape, add the Rocky and Appalachian Mountains to the map and have the students do the same.

8. Next go down to the bottom and explain the map key. Explain that a map key helps us remember what our symbols stand for on the map. Add the symbol for “mountains” to the map key on the overhead in brown marker. Ask the children to do the same. Circulate around the room to make sure that everyone is on the right track.

9. Next talk about forests. Talk about trees as a natural resource. Have children discuss the things that are made from trees. List their responses.

10. Then add 10 symbols for forest on the correct places on the overhead map in green. Have children add 10 on their maps in green crayon.
11. Then add the forest symbol to the map key.

12. Follow the same procedure to add each water feature (rivers, Great Lakes, and oceans), one at a time to the map and map key, using blue for the bodies of water. They will need their maps for the second session.

SESSION TWO
1. Ask students, or groups of students to put a red “X” in the area on their map that corresponds to where a given human activity would take place. Refer to the first question on each of the student handouts. For example: the question on the first handout states: “You are going hiking in a forest. Put a red X on your map in the place where you can do this.” Each of the handouts has a different question. Children are expected to answer only one of the questions.

2. After they have completed their maps collect them for evaluation. Assess them using the point system outlined in the handout at the end of the lesson.

3. Have the students solve the math questions individually, in partners, or in small groups. If working individually or in pairs, cut the questions apart and glue them to a blank sheet of paper. If the students are working in groups, break the work down into more manageable parts. During a given class period, individuals can only complete about 1 – 2 problems. (It is recommended that students have access to manipulatives in order to solve the word problems.)

4. After students have solved and recorded their strategies, to the word problems have a few of them share their strategies with the rest of the class.

Assessment
Assessment for the geography objective is based on completion of the map and map key. There are assigned points to each portion of the map activity. Mastery will be considered 80% or higher.

There is a rubric for the math objective that assesses their selection of operation, as well as whether they arrive at the correct answer. Mastery will be considered a 3 or higher on the rubric.

Extensions
The geography portion could be explored more in-depth as students research the various physical characteristics introduced in this lesson.

Two National Geographic books are excellent as either an introduction or extension to this lesson:

Sources
Problem types for this math lesson were adapted from Cognitively Guided Instruction skeleton problems and from: Urban Systematic Initiative Professional Development Manual supported in part by a National Science Foundation Grant under Grant Number MDR-8955346 and MDR-8550236.