## Cultural Lit. 16: Calculating Distance on Maps

Summary
Reading a map, students will determine the mileage from the local community to various scenic attractions in the Four-Corners-Region, after receiving direct instruction and carrying out activities in cooperative group settings, in 1-2 class periods. This is an interdisciplinary lesson with Math.

Time Frame
2 class periods of 60 minutes each

## Materials

1. Large size map of Dine' Bikeyah.
2. Class set of 5 desk size maps of Dine' Bikeyah.
3. Teacher generated handout of an enlarged map key with compass rose and symbols for mountains, rivers, lakes, towns, roads. 1 inch $=15$ miles on large Dine' Bikeyah map. 1 inch $=30$ miles on small Dine' Bikeyah map.
4. Paper, pencil, ruler.

## Background for Teachers

## Guarded Vocabulary:

Mileage, ratio, distance, approximate, approximation, add, multiply, divide, fraction.

## Intended Learning Outcomes

How to determine mileage between locations in SE Utah and the Four-Corners-region, using a map.
Instructional Procedures

## Introduce lesson to capture student's attention:

With large Dine' Bikeyah map at front of class, teacher tells the class that they are going to continue practice reading maps, and learn how to tell mileage between places on a map with the use of the map key and a ruler. Teacher hands out small Dine' Bikeyah maps, map key and ruler

## Problem/Prediction:

How can you get the students really thinking?
With students sitting in groups of four, teacher will ask students to work together in pairs of two to measure with the ruler, the inches-in a straight line-between Blanding and Four-corners. The distance is 3 inches on the big map, 1.5 inches on the small map.

## Teacher Instruction:

With the big Dine' Bikeyah map at front of class, and students working in table groups of four, teacher will discuss the concept of ratio ( 1 "-15 miles and 1 " -30 miles) and the mathematical procedures necessary multiplication, addition, division, fractions)to convert distance on a map to an approximation of real-life distance.

Using the ratio 1 ":15 miles from the big map and the straight line measurement of 3 inches between Blanding and Four Corners, teacher does the addition or multiplication on the board to calculate the real-life distance: $15+15+15=45$ or $3 \times 15=45$.

Next, teacher (with students following along) will do the calculation for the smaller map ratio of 1": 30. The small map measurement of 1.5 inches entails $1+1$ half or $30+$ (half of 30 ) or $30+15=45$.

Next teacher will measure the distance between Blanding and Four Corners by finding the route and measuring the roads. Blanding to Bluff-1.25 inches, Bluff to Hwy 160-3 inches, Hwy 160 to four Corners-. 25 inches. Total 4.5 inches (on big map). Teacher will lead the students through the mathematical procedures to calculate the distance via road travel and also discuss the concept of distance between places "as the crow flies" and on road routes.

Teacher asks students to select two more places on the map for measurement and calculation of distance. Teacher leads class through entire procedure for those two places. Teacher can do as many measurements together as time permits.

## How will you end your lesson?

Groups share with the class, the distances they calculated between places.

## Strategies for Diverse Learners

## How will you help ELL students?

## Guided Practice:

Teacher is circulating to each group and asking questions to check for comprehension of vocabulary, concept, and math procedures.

## Extensions

This lesson would be most successful if each group had an adult or older student helper at the table for the entire lesson. Independent practice in this lesson entails having a helper at each table group to work through various measurements of distances, between places that the groups choose.

## Assessment Plan

Observation of student participation, successful measurement of distance between places on the map.

## Unit Assessment

Students calculate the distance between their local community and a scenic attraction in the Four-Corners-region, and describe the geographical features of the scenic attraction.

## Authors

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