Mrs. Richards' Lesson Plan

Basic Math – Plan a Cruise

OBJECTIVES

1. Measure distances and report them in fractions
2. Convert fractions to decimals
3. Multiply decimals

AGE

Grades 6-10. This lesson can also be used with older students in Remedial Math level classes.

Extension Idea at the end of this lesson plan can be used for Pre-Algebra or Algebra students.

TIME ALLOWANCE

This may take 2-3 hours, depending on the level of the students

MATERIALS

Rulers
Maps of the cruise route

INSTRUCTION:

1. Students are provided with maps that show the cruise route (straight lines connecting the waypoints listed in the EPIC 2001 Operations Plan - attached).
2. Students use their rulers to determine the scale of the map (ex. 5/8" = 1000 miles)
3. Use ruler to measure distances between each waypoint, and report as a fraction
4. Convert the distances, reported as fractions, into decimal format (no calculators!)
5. Divide the measured distance (decimal) by the scale distance (decimal), and multiply by the scale to determine actual distance between waypoints

   Example:

   The scale of the map is 3/8 inch = 1000 miles.

Basic Math – Plan a Cruise

A student measures 0.2 inches between two waypoints.

Calculate 0.2 / .375 * 1000 to find distance in miles

6. Next, calculate how many hours it will take to reach each destination (assume 14 mph by boat)
7. Calculate how many days the trip will take (number of hours divided by 24)
8. Calculate fuel consumption (5 mpg)
9. Students should create a table (similar to the one below) to turn in for grading.

EXTENSION IDEA FOR ALGEBRA STUDENTS

- Have the students determine the formulas required for each calculation.
- Have the students create word problems from their project on note cards. An in-class assignment can involve students exchanging note cards to gain additional practice with determining the formulas to use.

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Waypoint	Map Distance (fraction)	Map Distance (decimal)	True Distance (miles)	Travel Time (hours)	Travel Time (days)	Fuel Consumption (gallons)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						

EVALUATION / ASSESSMENT

Teacher will circulate among students to provide assistance and make sure they are on track

Completed table will be graded

(excerpt from the EPIC 2001 Operation Plan, dated 7/15/01)

2.3 Cruise Way Points:

LEG 1

Way Point	Lat.	Long.	Naut. Miles	Ave. Sp	Hrs	ArrDep Date	Date	Comments
1	32.7 N	117.2 W	–	0 .0	–	9/3	9/6	San Diego
2	20.0 N	110.0 W	862	13.0	66.0	9/89/8		
3	12.0 N	95.0 W	1005	13.0	77.0	9/11	-	
4	12.0 N	95.0 W	--	0. 0	7.0	-	9/11	Repair buoy
5	10.0 N	95.0 W	120	13.0	9.0	9/12	9/12	
6	8.0 N	95.0 W	120	13.0	9.0	9/12	-	
7	8.0 N	95.0 W	--	0.0	7.0	-	9/13	Repair Buoy
8	10.0 N	95.0 W	120	13.0	9.0	9/13	-	Repair Buoy
9	10.0 N	95.0 W	--	0.0	480.0	-	10/3	ITCZ ops
10	0.0 N	95.0 W	600	9.8	61.0	10/5	10/5	CTD section
11	0.5 S	91.5 W	212	13.0	16.0	10/6	10/9	Galapagos Is.

LEG 2

Way Point	Lat.	Long.	Naut. Miles	Ave. Sp	Hrs	ArrDep Date	Date	Comments
1	0.5 S	91.5 W	–	--	70.0	10/6	10/9	Galapagos Is.
2	2.0 S	95.0 W	228	13.0	18.0	10/10	10/10	
3	8.0 S	95.0 W	360	9.8	37.0	10/11	10/11	CTD section
4	20.0 S	85.0 W	932	9.8	95.0	10/15	--	CTD section
5	20.0 S	85.0 W	–	0.0	144.0	--	10/21 mooring	IMET
6	20.0 S	72.0 W	756	9.8	77.0	10/24	10/24	CTD section
7	20.5 S	70.3 W	102	13.0	8.0	10/25	-	Arica, Chile