



1.1 WORLDWIDE ELEVATION ANALYSIS

APPROXIMATE TIME:

20 minutes

PREPARATION:

1 copy of Activity Sheet 1.1
for each student

GOAL:

To have the students understand the relationship between elevation and UV intensity through the use of geography data and math skills.

SUPPLIES PROVIDED:

- Activity Sheet 1.1,
Worldwide Elevation
Analysis

OTHER SUPPLIES NEEDED:

- None

LEARNING OUTCOMES:

After completing this activity, students will be able to:

- Calculate the increased risk for UV exposure at different elevations
- Identify the other factors contributing to UV intensity
- Describe the elevations of different cities around the world and the effects of that elevation on sun safety

ACTIVITY:

Provide each student with a copy of Activity Sheet 1.1. Give the students approximately 20 minutes to read the instructions and complete the "% Increased UVR" chart and following questions. Conduct a class discussion based on the answers to the final question and the factors that would affect UV intensity in the 3 scenarios.

ANSWERS:

1.

NAME OF CITY	ELEVATION	% INCREASED UVR
Shanghai, China	22 ft.	0.11%
Denver, Colorado	5,280 ft.	26.4%
Katmandu, Nepal	4,002 ft.	20.01%
Quito, Ecuador	9,181 ft.	45.91%
Oslo, Norway	308 ft.	1.54%
San Jose, Costa Rica	3,760 ft.	18.8%
Brisbane, Australia	137 ft.	0.685%
Reykjavik, Iceland	59 ft.	0.295%
Honolulu, Hawaii	7 ft.	0.035%
Riyadh, Saudi Arabia	1,939 ft.	9.695%
Albuquerque, New Mexico	5,311 ft.	26.555%
Cali, Columbia	3,162 ft.	15.81%

2. Reflective surfaces like snow, sand, and cement; latitude; climate

3. a) the high elevation, the high number of sunny days, and the reflective snow would increase UVR exposure

b) the latitude (closer to the equator), the high number of sunny days, and the reflective water and sand would increase UVR exposure

c) the latitude (closer to the equator) and the high elevation would increase UVR exposure; the amount of shade from the rainforest would help to shield from the sun and UV rays



1.1 WORLDWIDE ELEVATION ANALYSIS

NAME:

HOUR:

Since the atmosphere becomes thinner the higher you go, places with higher elevations are exposed to more UVR. Statistics show that UVR exposure increases about 5% per thousand feet above sea level. Calculate the increased risk of the following cities based upon their different elevations.

Equation: $\% \text{ Increased UVR exposure} = 5(\text{Elevation}/1000)$

Example: Shanghai, China is 22 ft. above sea level, so
 $\% \text{ Increased UVR exposure} = 5(22/1000)$
 $= 5(.022)$
 $= 0.11\%$

Therefore, Shanghai is at 0.11% increased risk for UVR exposure!

Now, you try...

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Denver, Colorado	5,280 ft.	
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Now, list other factors that may contribute to increased UVR exposure:

- Example: Reflective surfaces (snow, sand, etc.)

Based on the information above, what factors would affect the UVR exposure in each of these cities? How?

a) a snowy mountaintop in Denver, Colorado

b) a beach in Honolulu, Hawaii

c) a rainforest in San Jose, Costa Rica
