

- Multiplication
- Division
- Decimals
- Percentages
- SI Measurement and Conversion
- Geometry

Sedimentation in the Grand Canyon

Use your math skills to study the Colorado River’s rate of sedimentation in the Grand Canyon.

Imagine that you are a geologist and that you read the following excerpt in a geological journal:

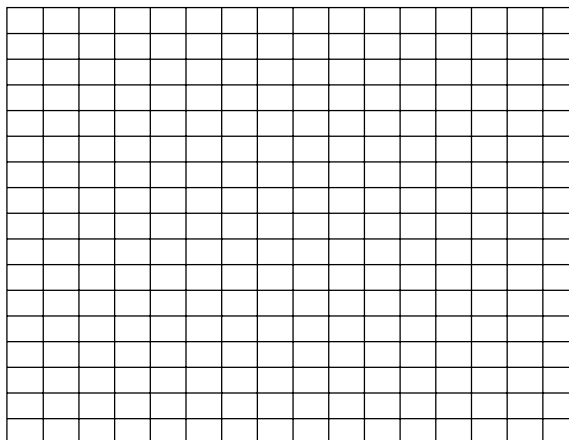
EARTH ALERT: A gradual change in the global climate is causing the Colorado River to slowly deposit sediment in the Grand Canyon. Scientists estimate that the present rate of deposition is raising the canyon floor by 0.05 mm per year.

Your geological interests lead you to ask some questions. Suppose that you’ve organized your questions and concerns into the following itemized list. Using your mathematical knowledge, answer the following six items about the fate of the Grand Canyon.

Question List

ITEM 1: If the canyon is 1500 m deep, how long will it be until the river completely fills the canyon with sediment? Show your work.

ITEM 2: Make a graph on the grid below to show the amount of sediment deposited in the Grand Canyon over an average human lifetime (about 75 years in the United States). Make sure to label the x-axis and y-axis and to give your graph a title.



Sedimentation in the Grand Canyon, continued

ITEM 3: Some geologists believe that the sedimentation rate of the Colorado River could increase in the future. If the rate of deposition increases by 40%, how much does the river deposit per year?

ITEM 4: What will be the total volume of sediment dumped into the canyon if the canyon is 2 km wide and 30 km long? Show your work.

ITEM 5: If the same amount of sediment from Item 4 were instead carried to the mouth of the river and dumped into the ocean, a delta would form. Assuming that the ocean is 500 m deep at the mouth of the river and that the elevation of the new land at the delta is at sea level, what will be the surface area of the delta? Show your work. (Hint: area = volume ÷ depth)

Critical Thinking Challenge

ITEM 6: An animal is buried by the sediment at the bottom of the canyon. If a fossil hunter finds the animal 1 million years after the canyon is completely filled, how old will the fossil be? Explain your answer.
