

Metric Ruler Problems

— Set 1 —

1. A length of a paper clip would measure closest to

- (1) 13 cm (3) 3.1 cm
(2) 13 mm (4) 3 mm 1 _____

2. A sediment was measured to be 8.9 cm. This converts to now many mm?

- (1) 890 mm (3) 8.9 mm
(2) .089 mm (4) 89 mm 2 _____

3. The height of the following sediment is:



- (1) 2.2 cm (3) 230 mm
(2) 3.8 cm (4) 3.0 cm 3 _____

4. Convert the following:

- a) 8.2 cm = _____ mm
b) 62 cm = _____ mm
c) 67 mm = _____ cm
d) 4.5 mm = _____ cm
e) 33 cm = _____ m
f) 125 cm = _____ m
g) .50 m = _____ cm
h) 3.25 m = _____ cm

— Set 2 —

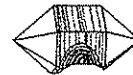
5. Using a metric ruler, what is the length of the fossil shown below?



Bothriolepis

- (1) 3.7 mm (3) 4.3 mm
(2) 3.7 cm (4) 4.3 cm 5 _____

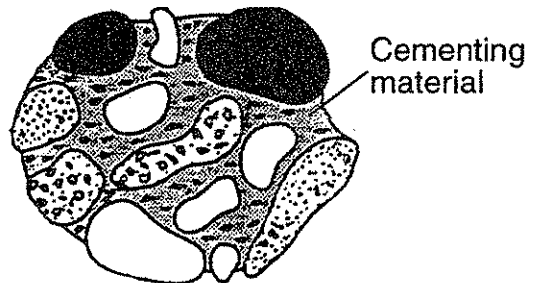
6. What is the length of the quartz mineral shown below?



Quartz

- (1) 1.6 mm (3) 2.5 mm
(2) 2.5 cm (4) 1.6 cm 6 _____

7. The average size of the pebbles in the sample is approximately



(Actual size)

- (1) 1.2 cm (3) 6.4 cm
(2) 0.2 cm (4) 13.2 cm 7 _____

NAME _____ DATE: _____

CLASS: _____ TEACHER: _____

RATE OF CHANGE

Computing Change Over Time Student Worksheet

Introduction: Rate of Change is really NOT difficult. Simply put, change that has happened or that is occurring in something is expressed over a unit of ONE. We do not say that a car is traveling 60 miles per TWO hours. We say the car is traveling 30 miles per ONE hour (30 mph).

So, if data is supplied for a situation that has occurred over a long time, you will have to change the information to, for example, ONE year or ONE hour, etc.

Here is your equation:

| | |
|----------------|---|
| Rate of change | rate of change = $\frac{\text{change in field value}}{\text{time}}$ |
|----------------|---|

Change in Field Value simply refers to **whatever data is supplied that is changing over time**.

It could be elevation, sea level, pollution, plate movement or just about anything.

Time is obvious and will be supplied in the problem.

Rate of Change is one of the few answers that requires a "**double unit**". For example,

centimeters/year (**cm/yr**) or
degrees/minute (**°C/min**)

The math is not difficult.

When dividing....remember "**bottom number (time) into top number**".

So, top number in the calculator first....division sign....bottom number....equals....and you have your answer!

Directions: Print out this worksheet and answer all problems. The first page is your formula and explanations. Pages 2 and 3 are the actual questions, all based on "one year" for ease in learning to work with this equation. Staple your pages unless otherwise directed by your teacher. Question 6 is different and a bit of a challenge. **Show your Work!!!!**



1- Mount Everest has risen 8.2 meters in the last 100 years. How many meters did Mount Everest uplift in one year?

Calculations:

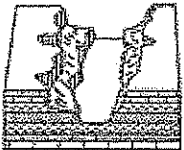
Final Answer: _____



2- A 1995 EPA study projects sea levels will rise about 30 centimeters (relative to the land) over the next century for the U.S. coast. Express this rise in sea level for a period of one year.

Calculations:

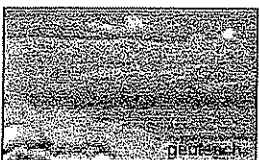
Final Answer: _____



3-Scientists generally agree that erosion of the Grand canyon started about 6 million years ago. The canyon, created by the Colorado River cutting a channel over millions of years, has attained a depth of about 1,600 m which is more than a mile. On the average, how many meters per year did the Colorado River downcut into the canyon?

Calculations:

Final Answer: _____



4-Earth's crust floats on viscous, fluid rock in the asthenosphere. Extra weight on the crust will cause the crust to sink while removal of weight will allow the crust to uplift (or "rebound") back to its original condition. This concept is termed: *Isostasy*. Since the last period of glaciation, beaches on Kong Karls Land have risen 130 meters above sea level over the last 10,000 years. On average, how many meters have the beaches risen in one year?

Calculations:

Final Answer: _____



5-Average global surface temperatures have increased about 0.6°C over the last century. On an average, approximately how many degrees have temperatures risen each year?

Calculations:

Final Answer: _____

6-Today, Earth's average temperature is: 57°F (14°C). If the rate of global temperature change continues to increase as per your calculations for question 5, what will be the average global temperature, in degrees Celsius, by the year 4,050?

Calculations:

Final Answer: _____

Due Date: _____

**Be sure to check with your teacher to verify you can receive extra credit.
Ask your teacher when the assignment is due and how much credit you will receive.**



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Reference Used for Kong Karls Land: <http://maps.unomaha.edu/Maher/plate/week1/intro.html>
Valley graphic: The University Of the State of New York; Board of Regents; Earth Science Regents Examinations

Close Window