Prelab + Plate Movements

Contents

Figure 1: At Field Museum in Chicago, Nov. 2008

I Prelab

A Prefix

T [tera-] (10^{12}), **G** [giga-] (10^{9}), **M** [mega] (10^{6}), **k** [kilo] (10^{3}), **c** [centi-](10^{-2}), **m** [milli-] (10^{-3}) , nano (10^{-9}) ....

Conventionally, 1 metric ton= 1000 kg. 1 ml =1 cm^3. 1 G = one billion. 1 M = one million.

$$1\ mm = 1 \times 10^{-3} \times m = 0.001\ m$$
$$1\ km = 1 \times 10^{3} \times m = 1000\ m$$
$$1\ cm = 1 \times 10^{-2} \times m = 1 \times \frac{1}{10^2} \times m = 0.01m$$

B The laws of exponents

Know the difference between 10×3 and 10^3.

$$10 \times 3 = 10 + 10 + 10 = 30$$
$$10^3 = 10 \times 10 \times 10 = 1000$$

EX. Which offer should you get?
$\$10 \times 10$ or $\$10^{10}$?

$$\$10 \times 10 = \$100$$
$\$10^{10} = \$10\ 000\ 000\ 000 = 10$ billion dollar!! — It's your call.

C Unit conversion

The idea is multiply by 1—unwanted unit for denominator.
Ex. 75 mi/hour is equal to how many km/hour?

$$75\frac{mi}{hour} \times \frac{1.609\ km}{1\ mi} = 120.675\ \frac{km}{hour}$$

D Years before present: Geologic Time

- Combine SI symbols with ”a” for annum (years before present).

$$65 \text{ Ma} = 65 \times 10^6 \text{ years ago} = 65,000,000 \text{ years ago}$$

II Plate boundaries

A Three types of plate boundaries

Mountain building, volcanoes, and earthquakes are mostly concentrated along plate boundary. **movie**

- **Divergent** boundaries: Plates are moving apart.
  ex. **Mid-ocean ridges**, **rift zones**
- **Convergent** boundaries: One plate subducts under the other. ex. **Sumatra**.
- **Transform fault** boundaries: Plates slide pass one another.
  ex. **San Andreas Fault.**

B Hotspot

Hotspot: A ”gigantic” volcanic source that is fixed in the location for millions of years. movie

III Questions

Question Set

Do all questions of each question set. Words in parentheses are hints. Show the calculation processes or you get zero point.

- **89** [p. 176] (Negative values mean convergence.)

  v. Don't do this.

- **90** [p. 178]

  ii, iii (Time period used to calculate the rates are different)

- **97** [p. 191]

  ii (This is a misleading question; Volcanism actually doesn't move, but the plate does. Make sure that the unit is cm/yr. The answer should be about 9 cm/yr.)

  iii (Basically it's asking how you explain the formation of Hawaiian island chains)

- **98** [p. 194]

  i-a Don't do this.

  i c. The answer should be about 8 cm/yr.

  iii. Don't do this.

IV Help making contour lines for bonus point