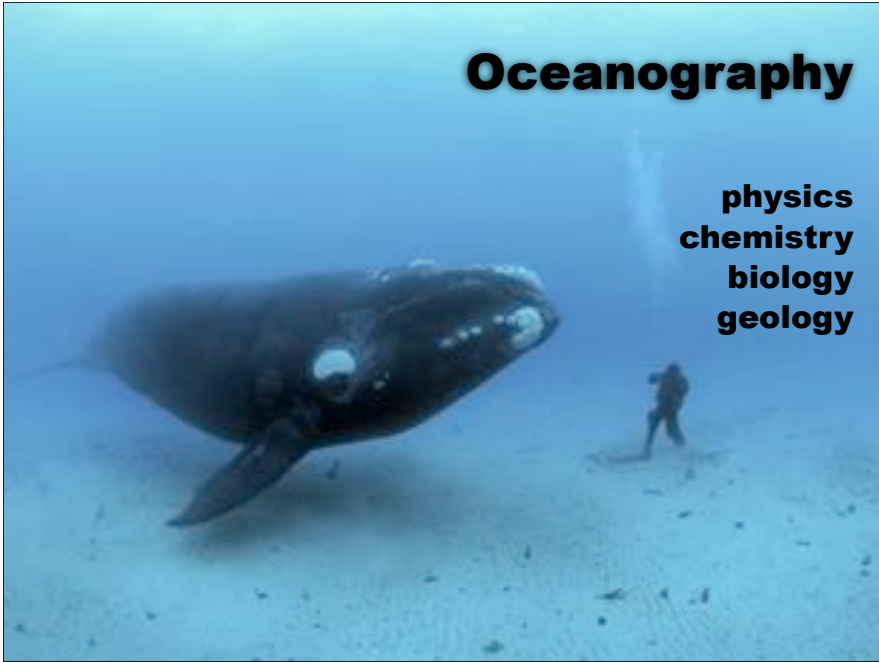


Oceanography

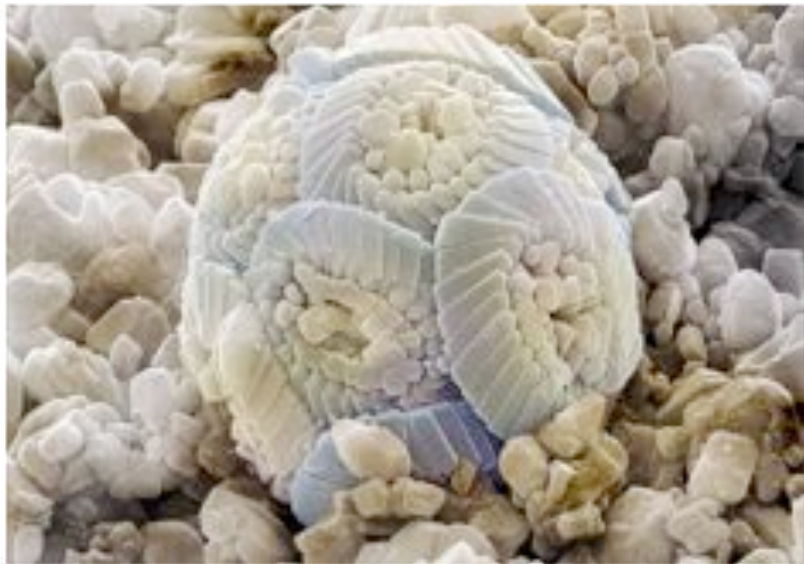
physics
chemistry
biology
geology



Big Picture



Small Picture



Hazards



What is Science?

not just facts
methodology, process

undsci.berkeley.edu

characteristics of science:

- 👤 a culture of doubt
- 👤 testability
- 👤 tentative results
- 👤 falsifiable



Hierarchy of Information

personal communication

books

pop sci

peer-reviewed journal articles

peer-review



Scientists = Mad Observation Skillz



Subjective, Objective qualitative, quantitative



Scientific Notation

the mass of the Earth=
5,973,600,000,000,000,000,000 kg

in scientific notation,
 5.9×10^{24} kg
“ten to the 24th power”

$$10^6 = 1,000,000$$

$$10^{-6} = 0.000001$$

$$10^1 = 10$$

$$10^2 = 100$$

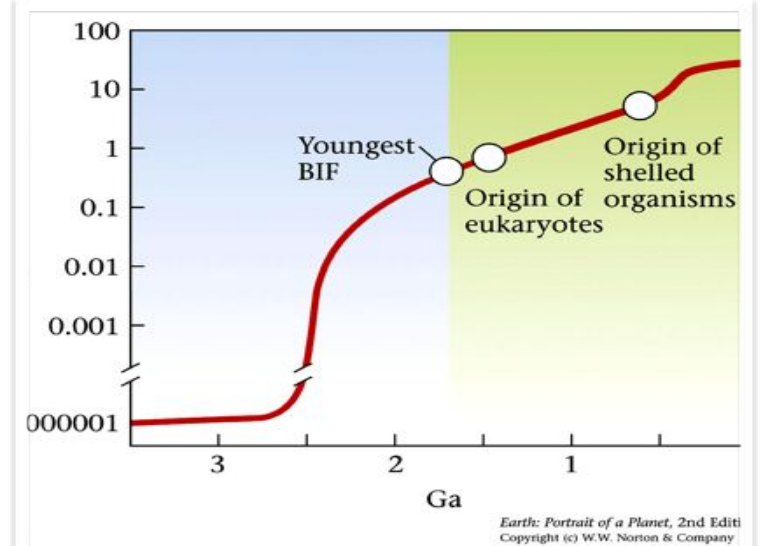
$$10^3 = 1000$$

the mass of an electron =
0.00000000000000000000000000091093826 kg

in scientific notation,
 9.1×10^{-32} kg

order of magnitude: 10^2 to 10^3 , 10^{-5} to 10^{-6}

Logarithmic Scales



Units

science uses only “SI” units
Système international d’unités

meters, kilogram, Celsius

1 meter (m) = 3.28 feet

1 kilometer (km) = 1000 meters = 0.621 miles

1 gram (g) = 0.035 ounces

1 kilogram (kg) = 2.2 pounds

0° Celsius = 32° Fahrenheit

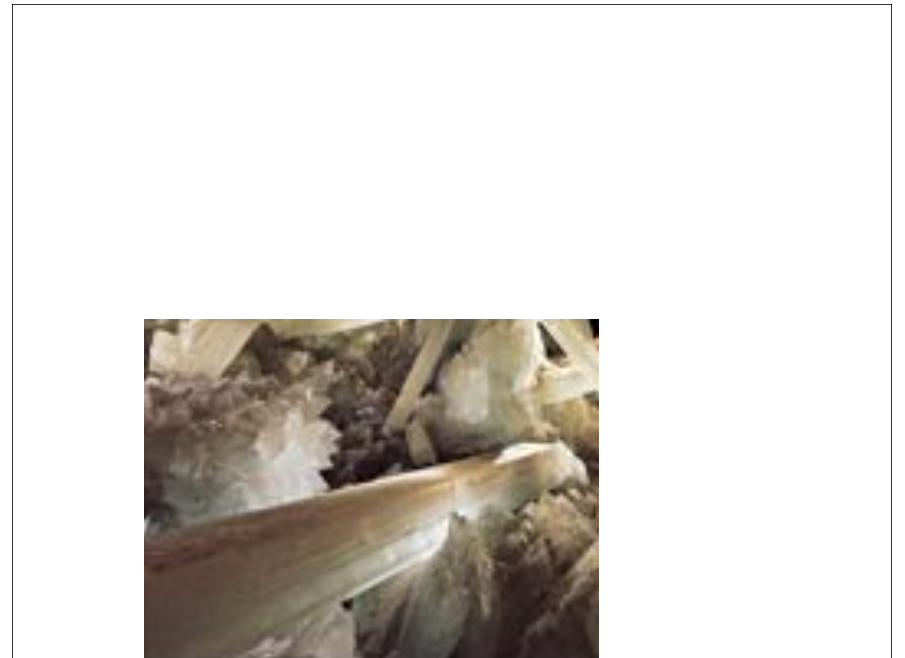
100° C = 212° F

to convert C to F, multiply by 1.8 and add 32



Scale—we need a reference to determine size





**Naica
Mountain
Mexico**



Geologic Time

Ka = kiloannum
1,000 years

Ma = megaannum
1,000,000 years

Ga = gigaannum
1,000,000,000 years