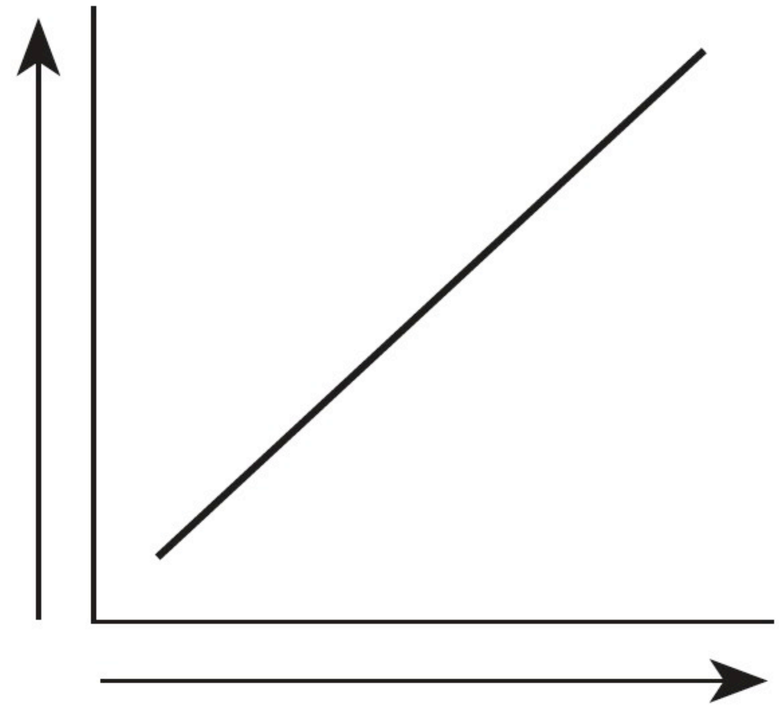
117 Things to Know...

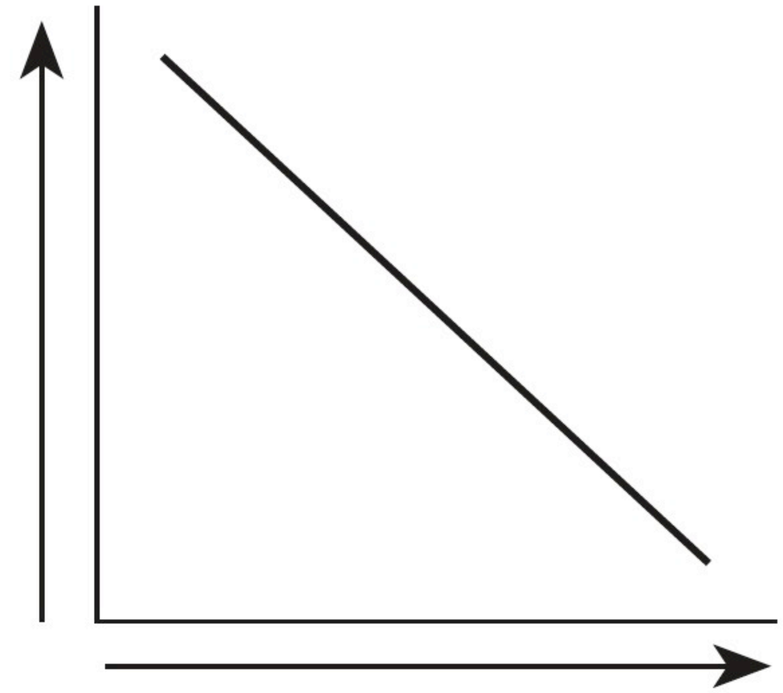
17 Things to Know...

1

The same substance always has the same density.



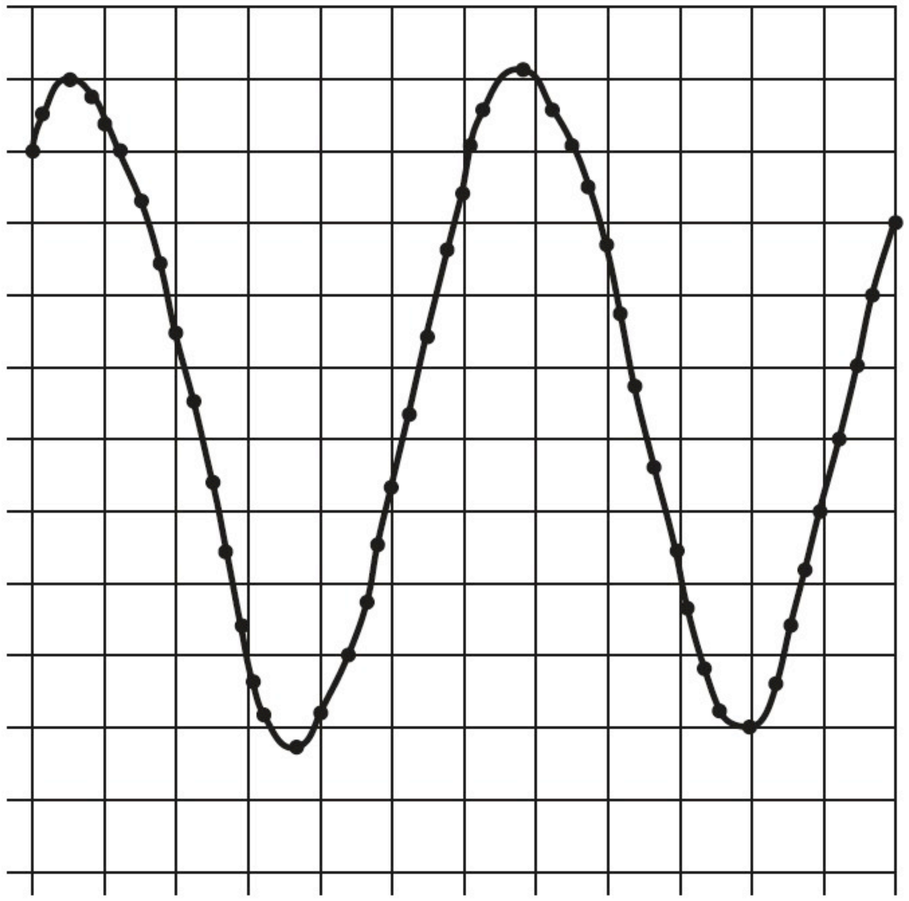
As pressure increases, density increases



As temperature increases, density decreases

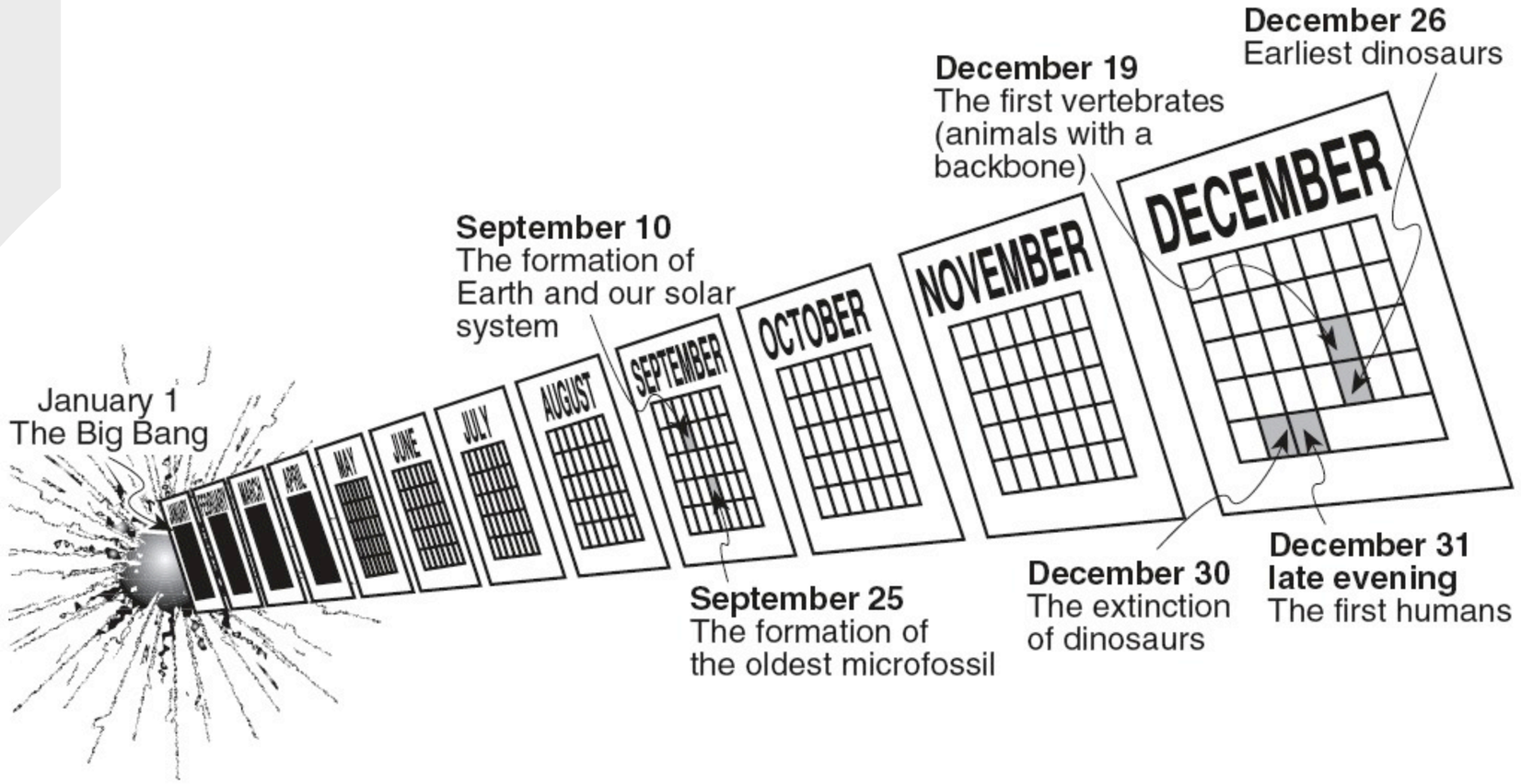
4

Water expands when it freezes



Most changes are cyclic.

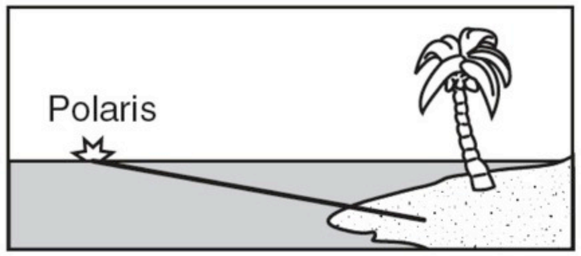
Water is most dense at 4°C, when it is a liquid.



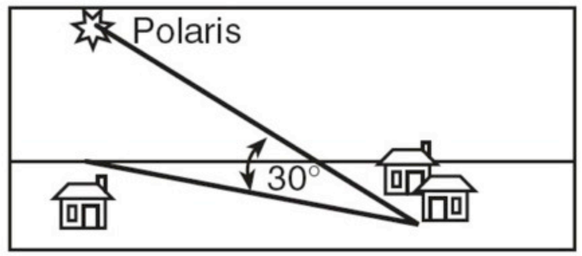
The universe began with an explosion, "The Big Bang."

The best model of the Earth is a sphere.

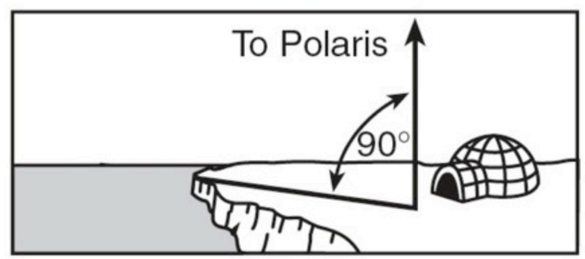
At Equator



At New Orleans, Louisiana

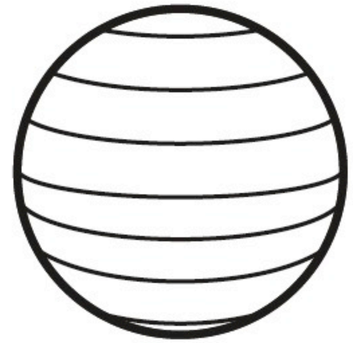


At North Pole

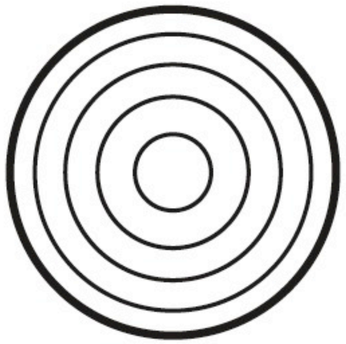


The altitude of Polaris equals your latitude.

Our solar system is located on one of the outer arms of our Milky Way Galaxy.

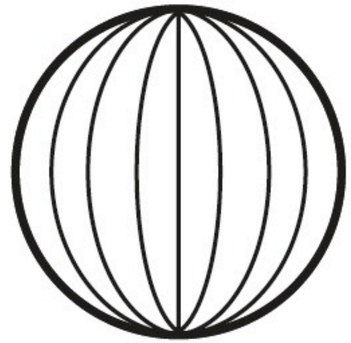


Equatorial view

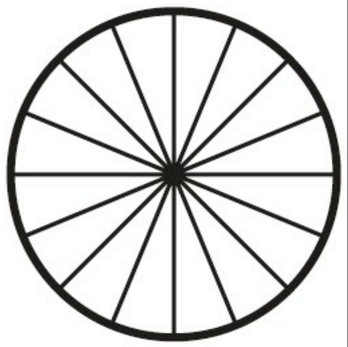


Polar view

Latitude lines go east-west, just like the equator, but measure distances north or south.



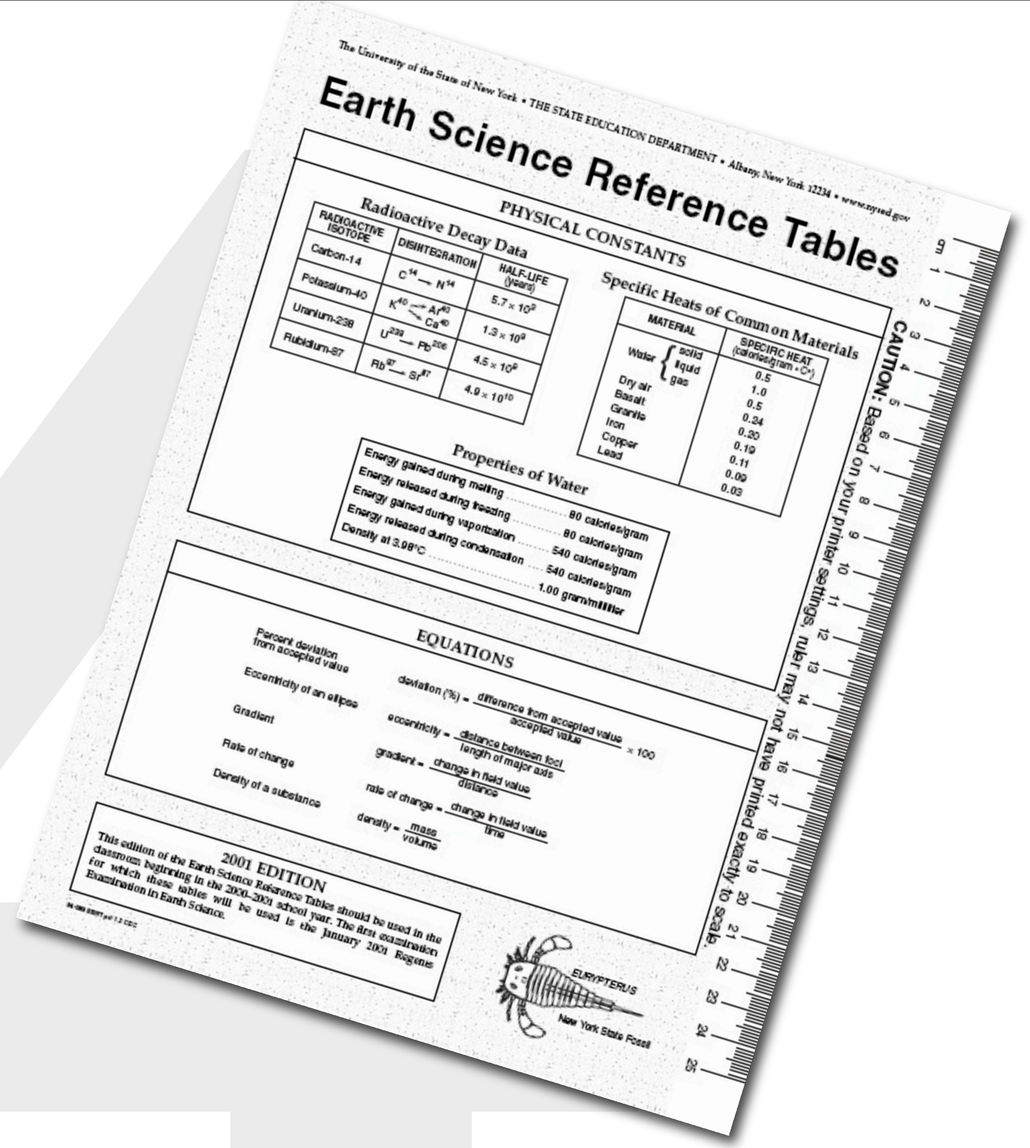
Equatorial view



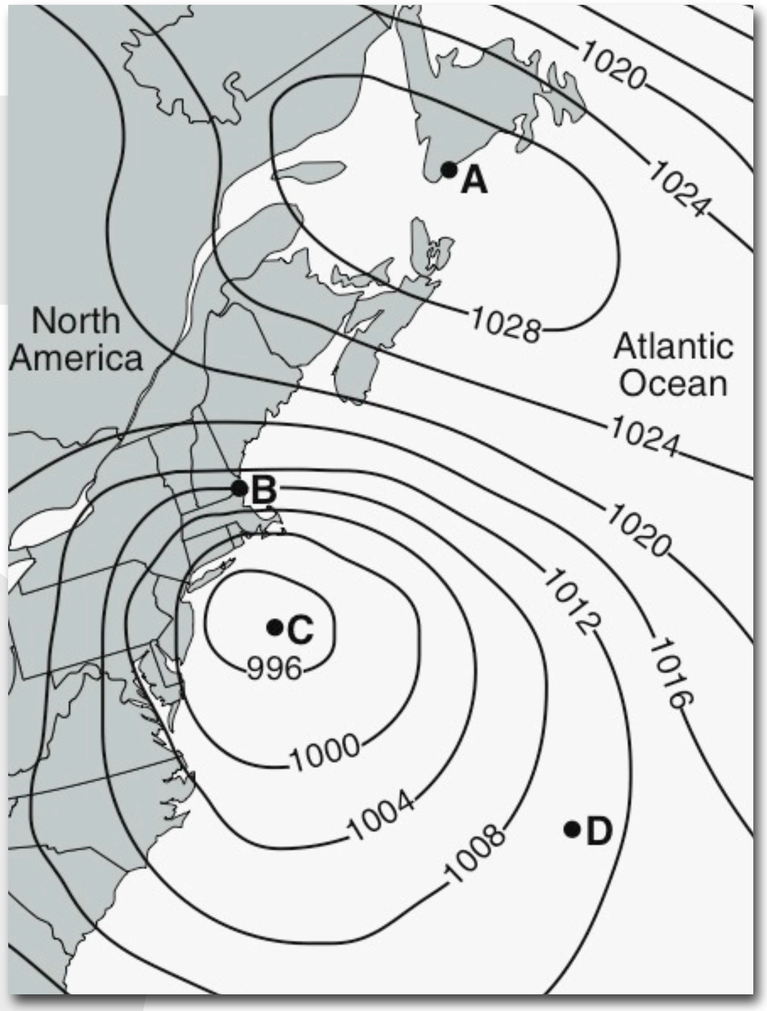
Polar view

Longitude lines go north-south, but measure distances east or west.

Longitude is based on observations of the sun.



USE THE ESRTs.

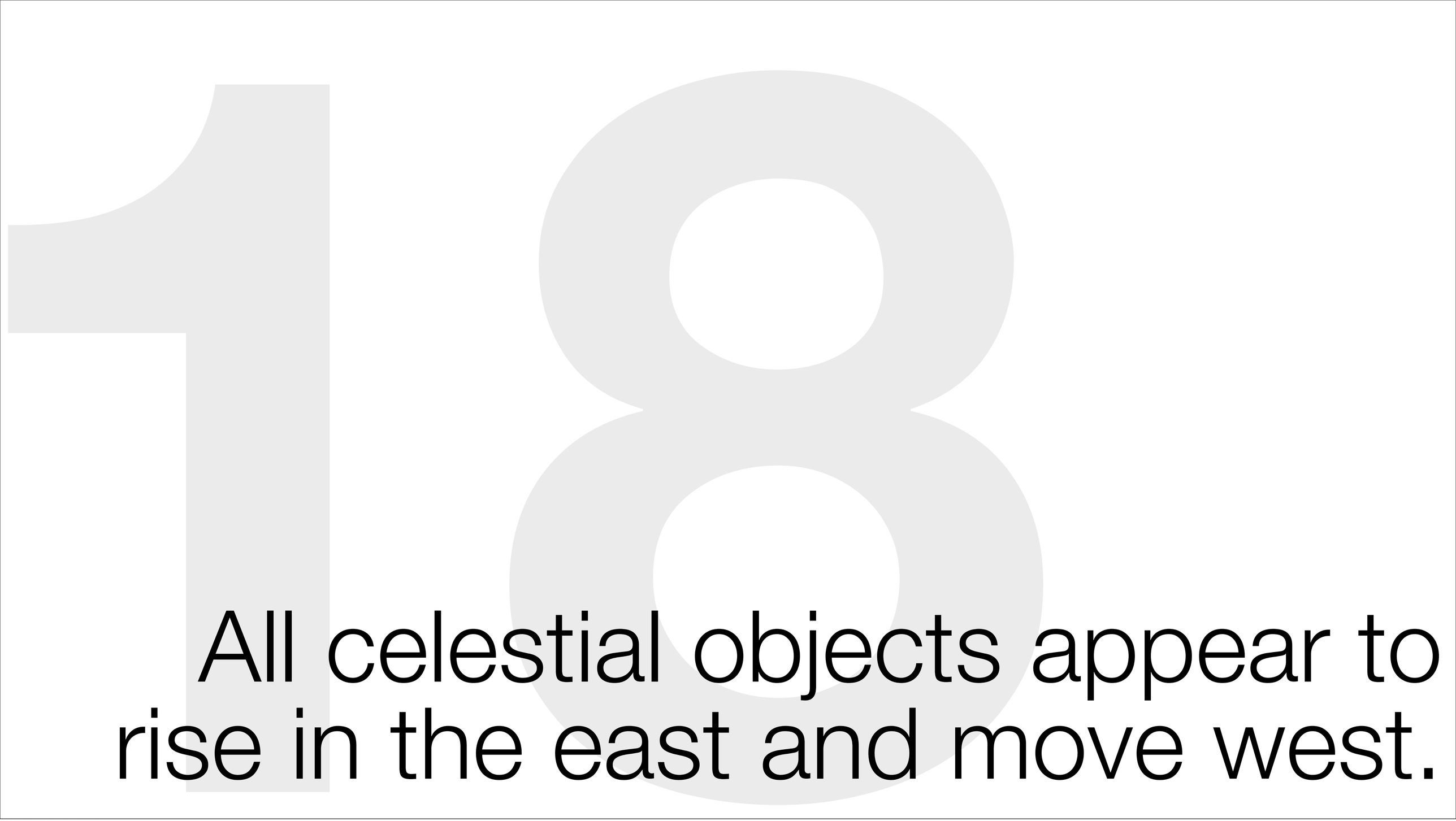


The closer the isolines are the steeper the slope or gradient.

The earth rotates from west to east (24 hours).

17

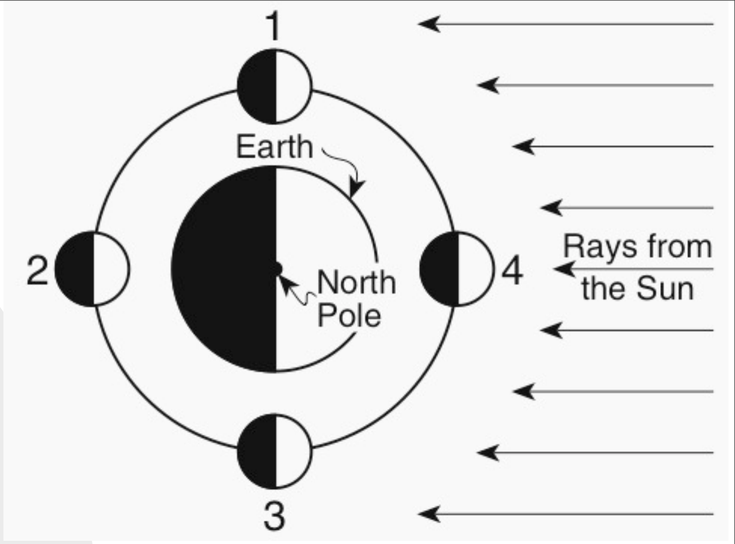
The earth revolves counterclockwise
(365 1/4 days).



All celestial objects appear to rise in the east and move west.

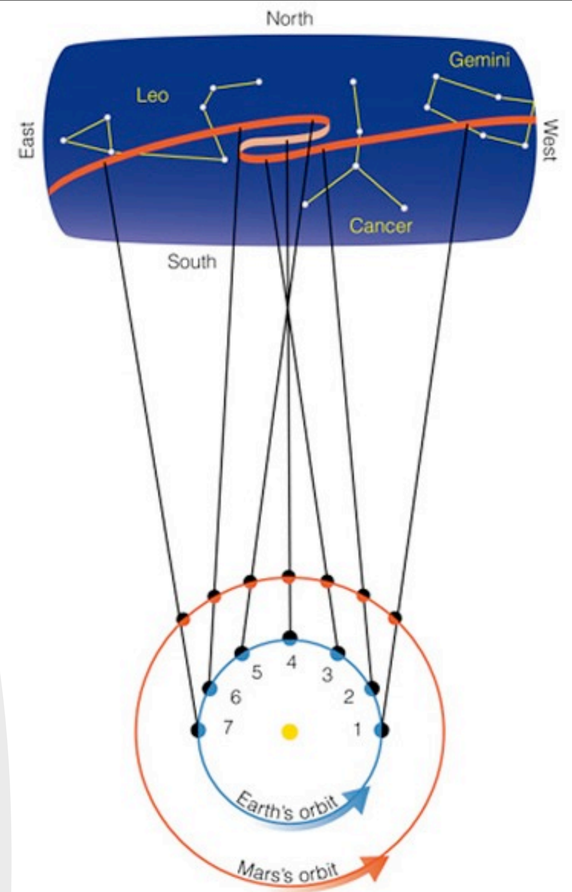
10

The moon has phases because it revolves around the earth (remember that only half is ever lit).

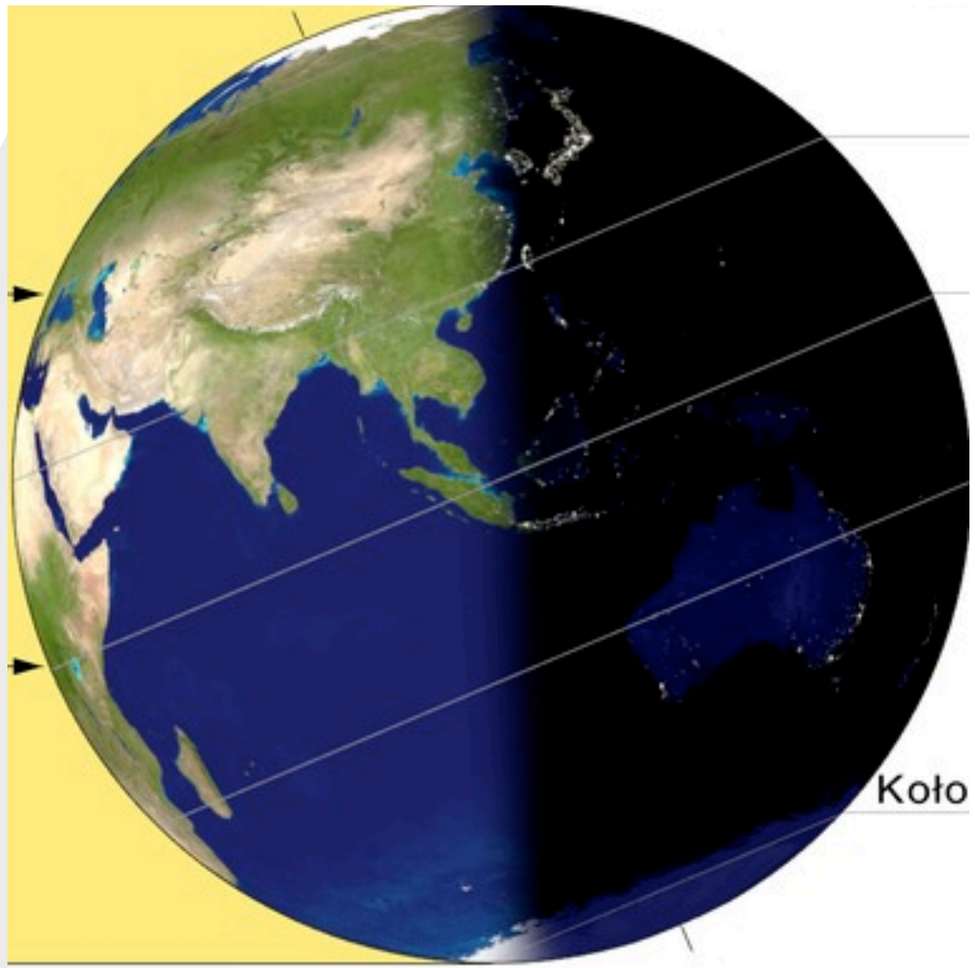


The moon has phases because it revolves around the earth (remember that only half is ever lit).

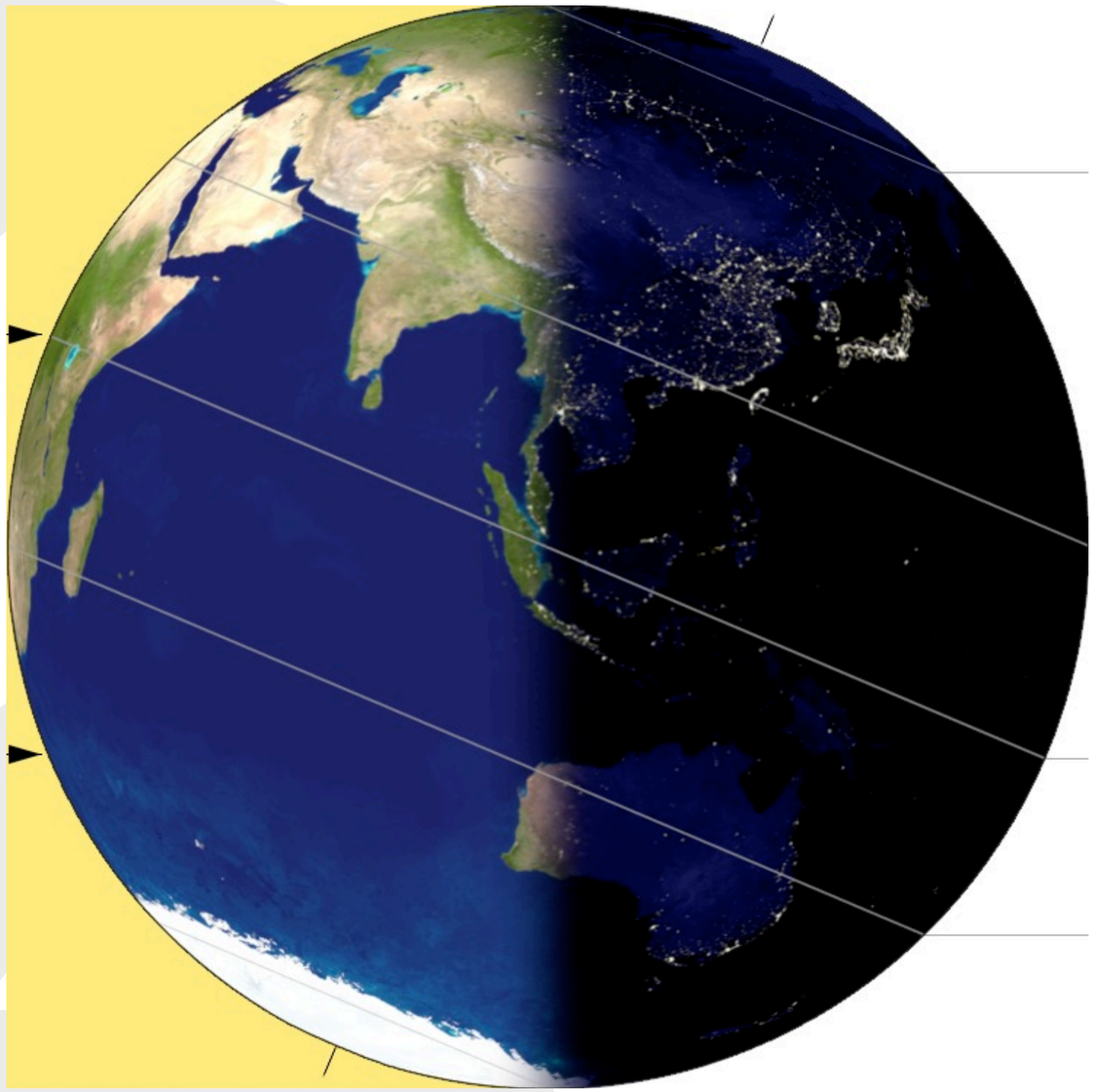
Planets appear to go backwards (retrograde) as the earth passes them in space.



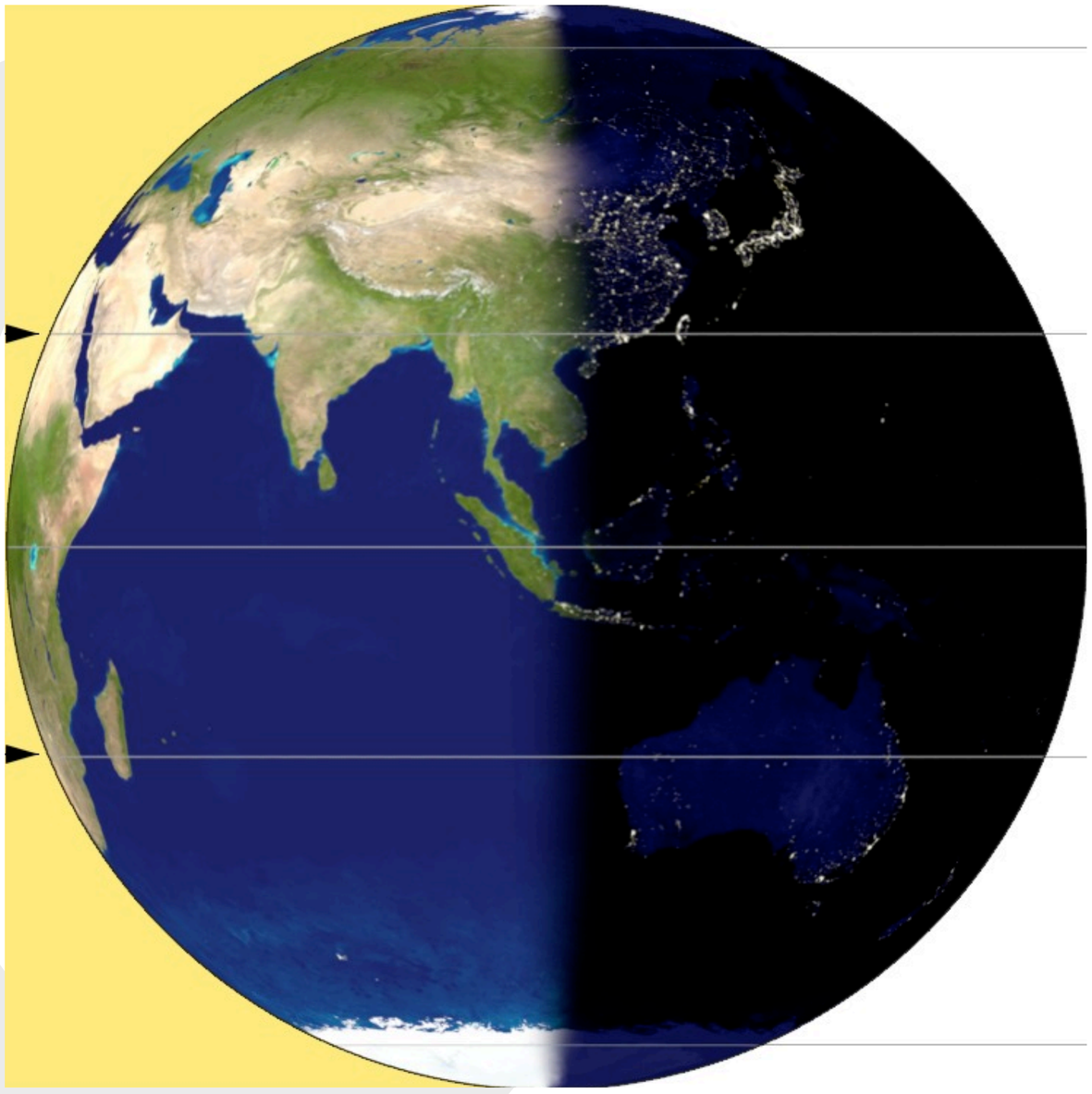
Planets appear to go backwards (retrograde) as the earth passes them in space.



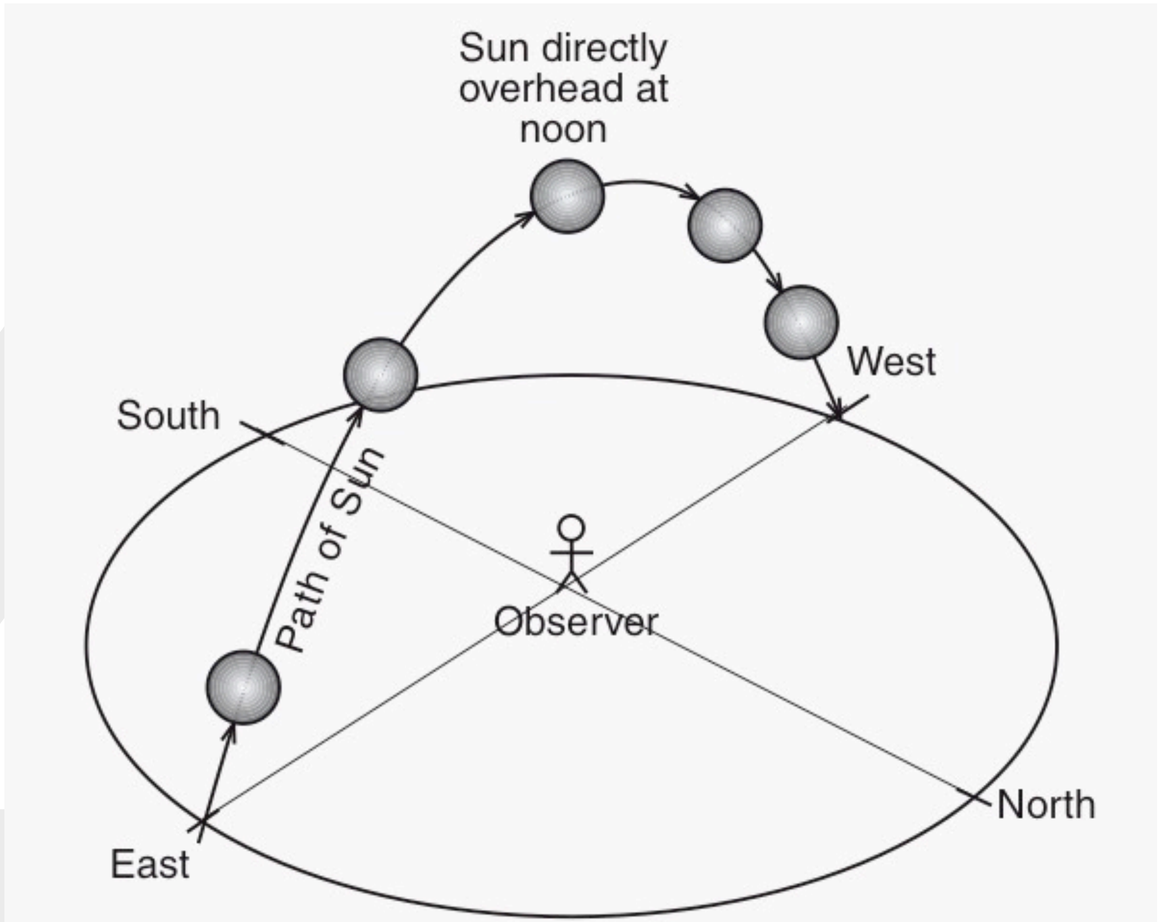
Summer solstice is June 21st.



Winter solstice is December 21st.

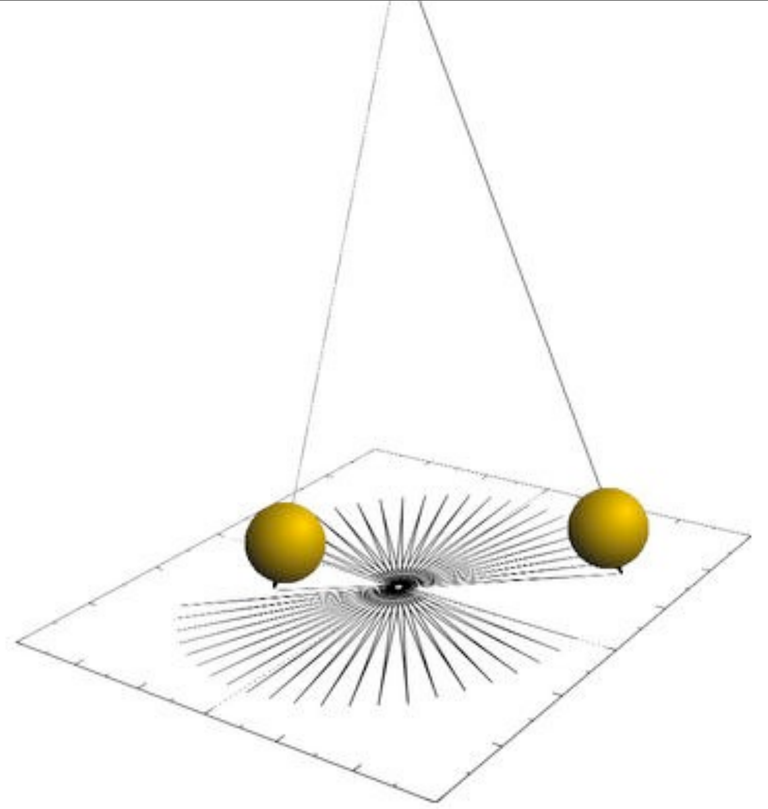


Equinoxes: March 21st September 23rd

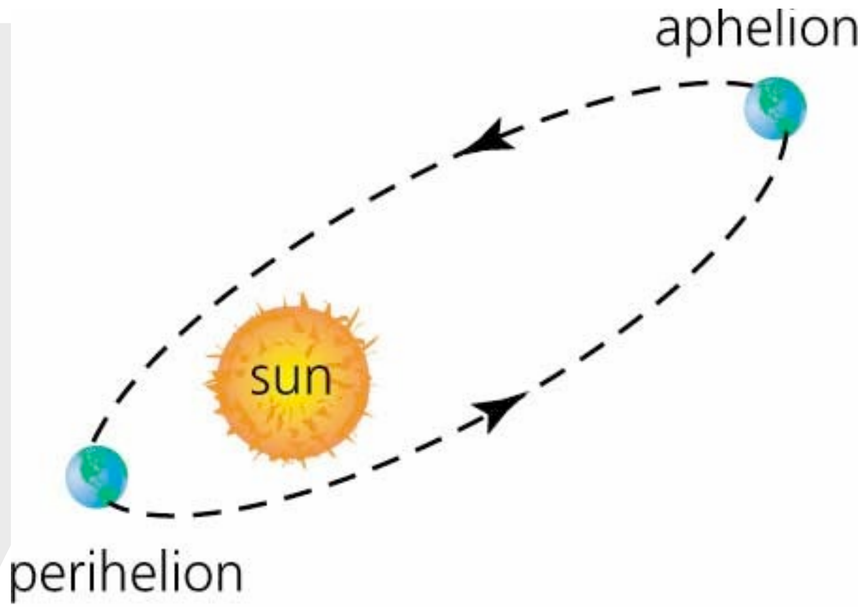


Equator always has 12 hours of day-light.

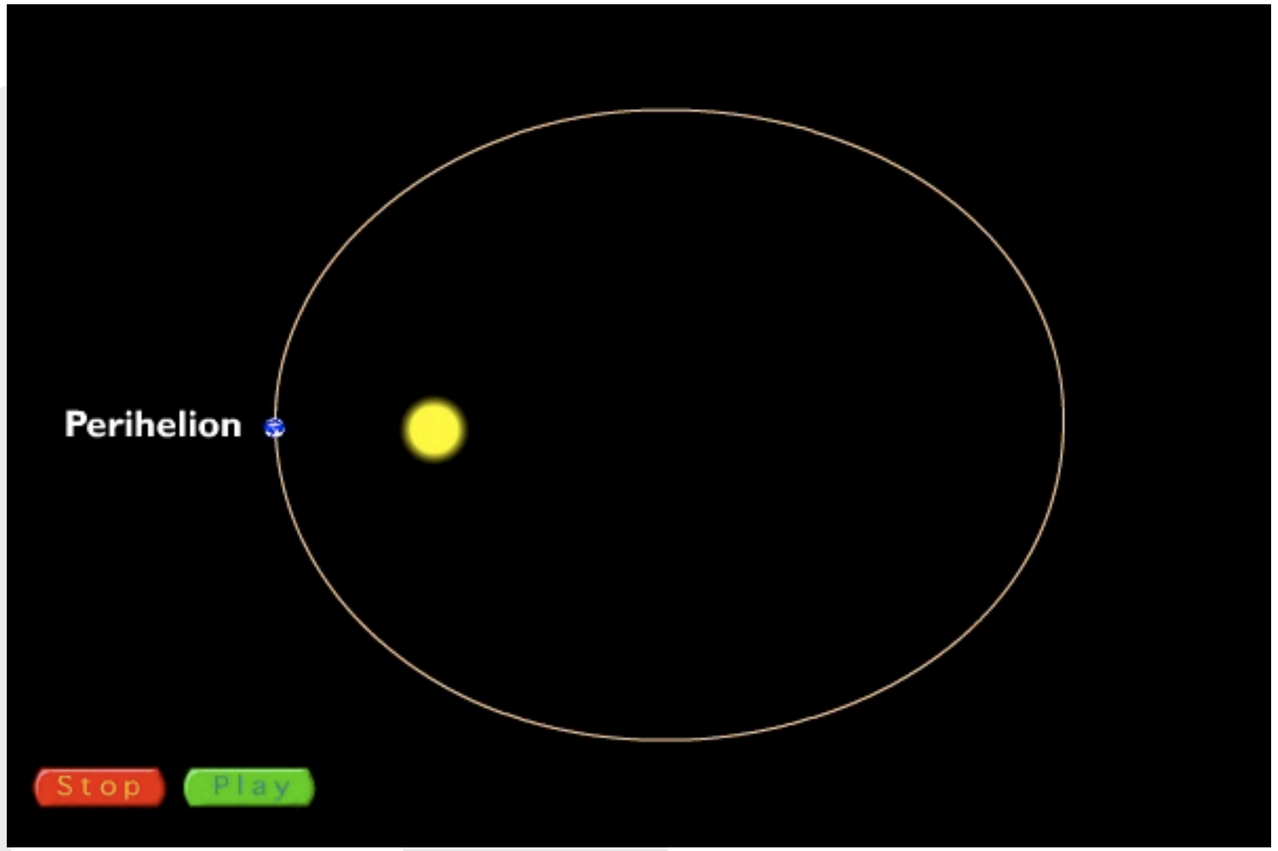
The lower the altitude of the sun, the longer the shadow it casts.



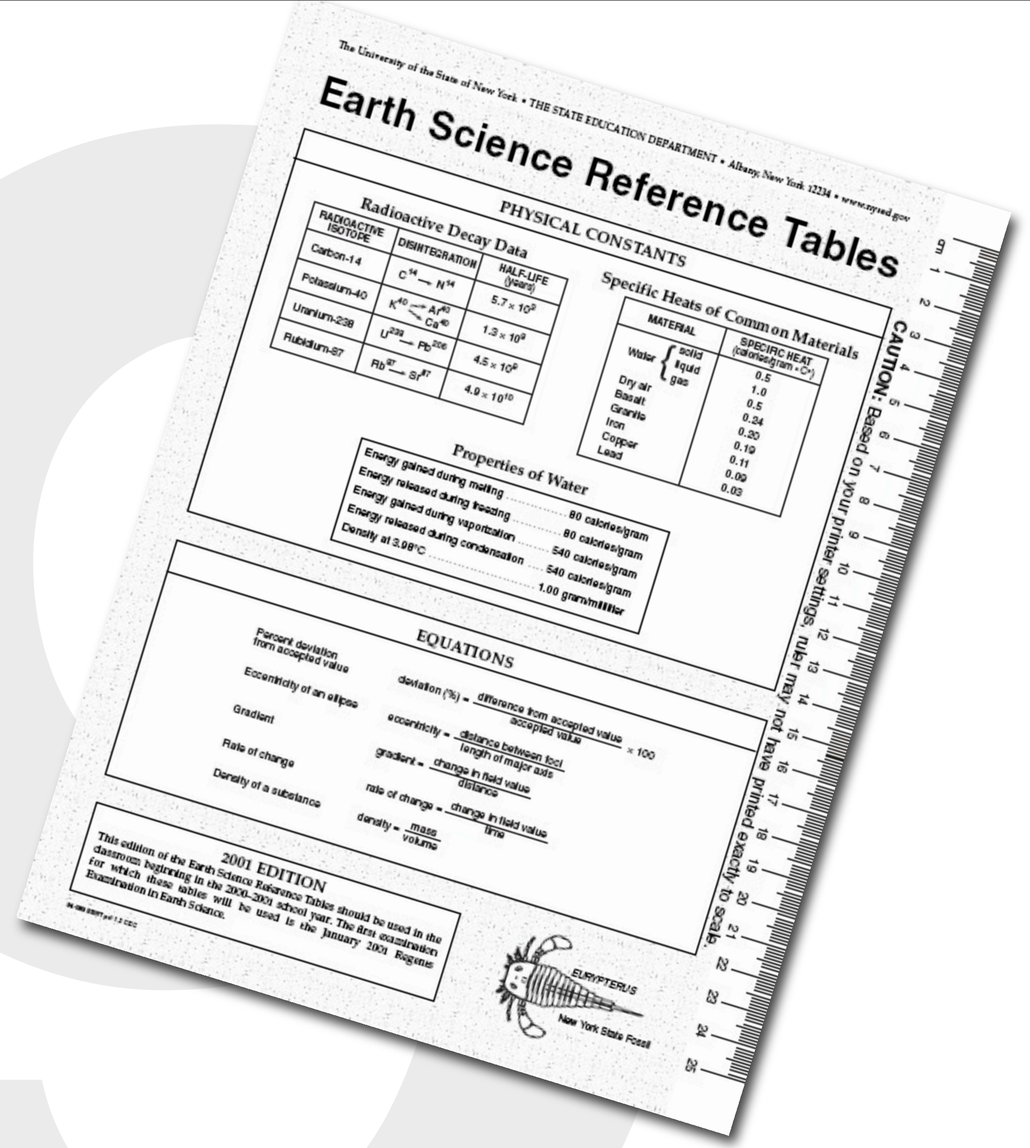
Foucault's pendulum and the coriolis effect prove the earth rotates.



Earth is closest to the sun in January.

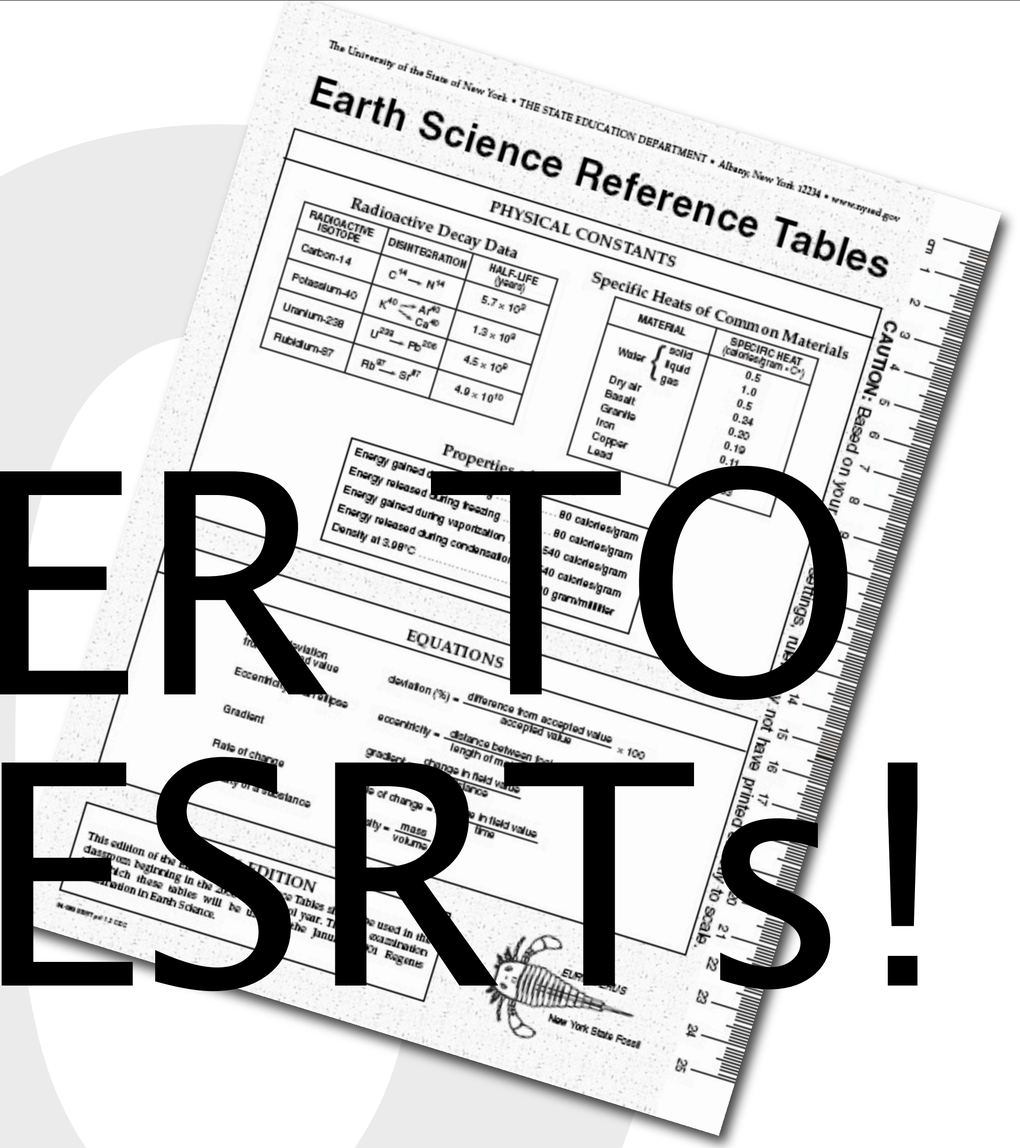


The closer a planet is to the sun the higher it's velocity.



USE THE ESRTs!

REMEMBER TO USE THE ESRTs!



Black and rough surfaces are the best absorbers and radiators.

RADIOACTIVE ISOTOPE	DISINTEGRATION	HALF-LIFE (years)
Carbon-14	$C^{14} \rightarrow N^{14}$	5.7×10^3
Potassium-40	$K^{40} \rightarrow Ar^{40}$ / $K^{40} \rightarrow Ca^{40}$	1.3×10^9
Uranium-238	$U^{238} \rightarrow Pb^{206}$	4.5×10^9
Rubidium-87	$Rb^{87} \rightarrow Sr^{87}$	4.9×10^{10}

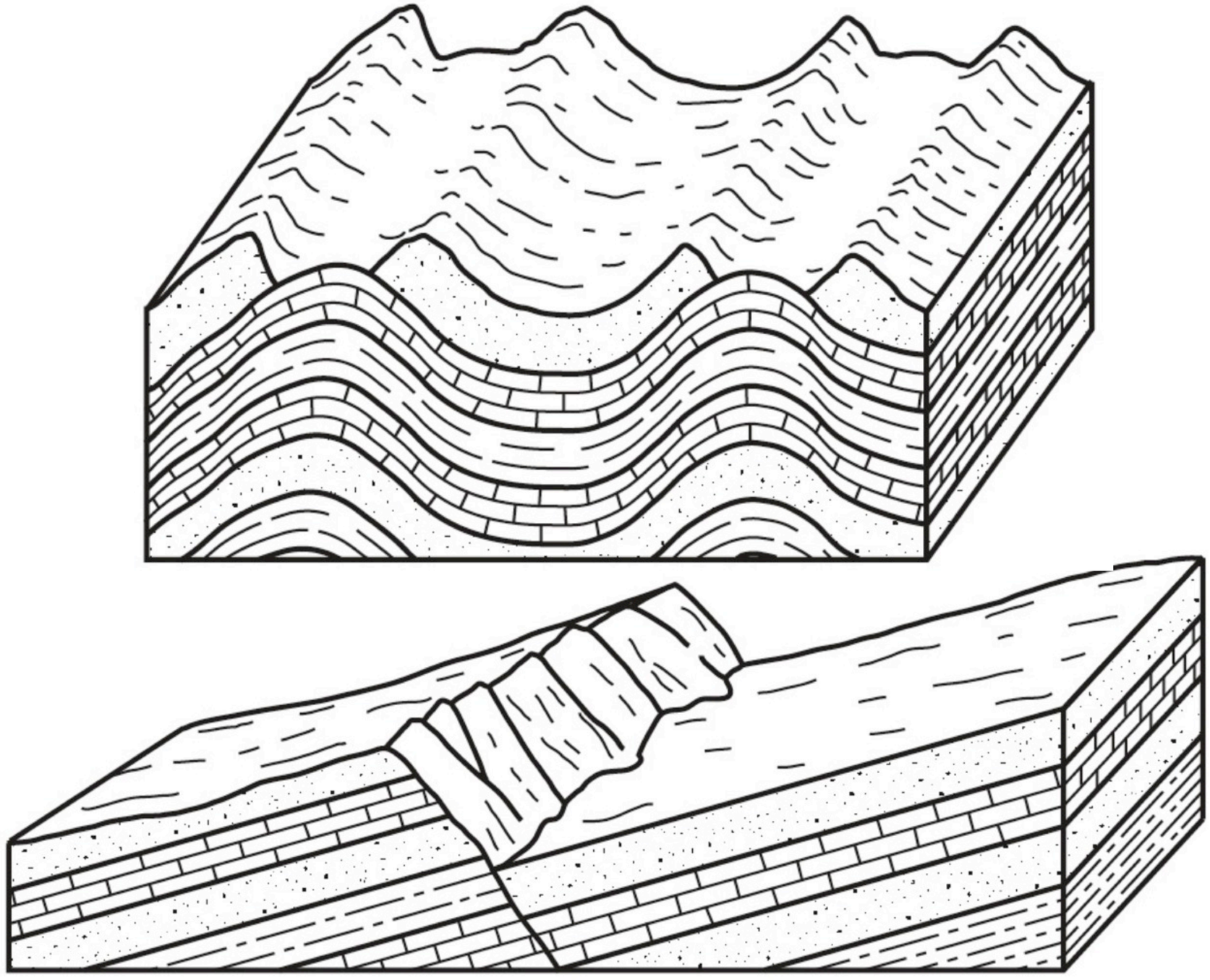
The half-life of a radioactive element can't be changed.

Ocean crust is thin, dense, and made of basalt.

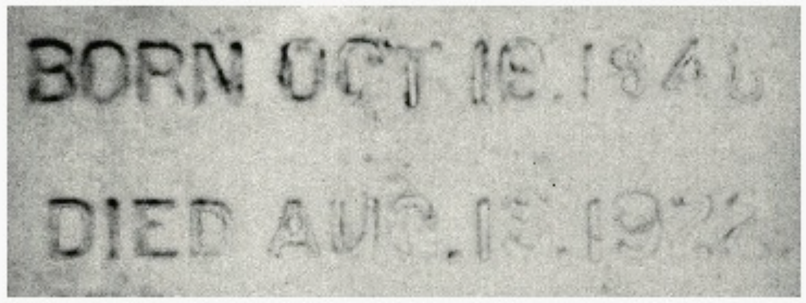
Continental crust is thick, less dense, and made of granite.

Energy moves from source to sink: high to low.

Mountains form by uplift, folding and faulting.



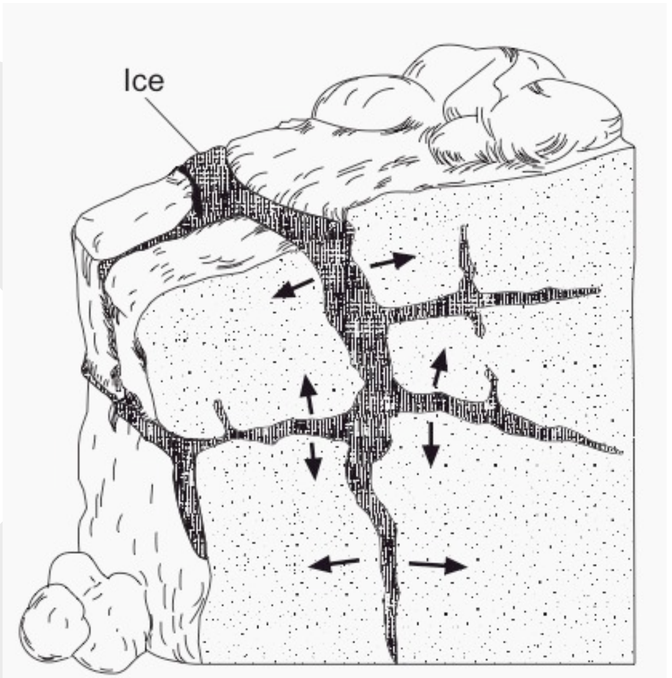
Chemical weathering occurs mostly in warm, humid climates.



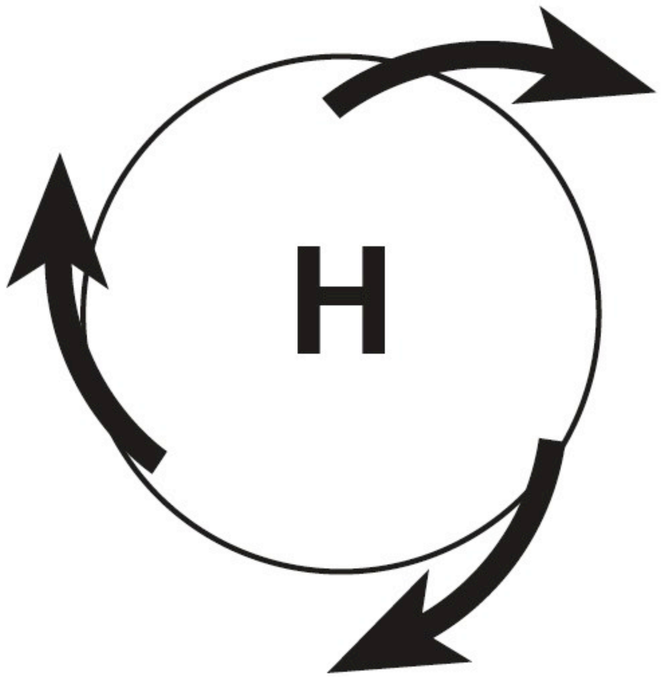
Tombstone A (1922)

Tombstone B (1892)

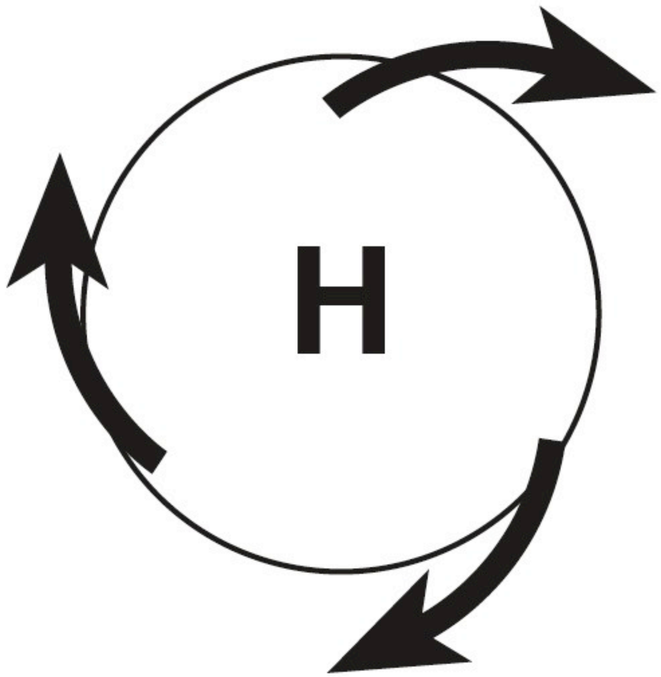
Chemical weathering occurs mostly in warm, humid climates.



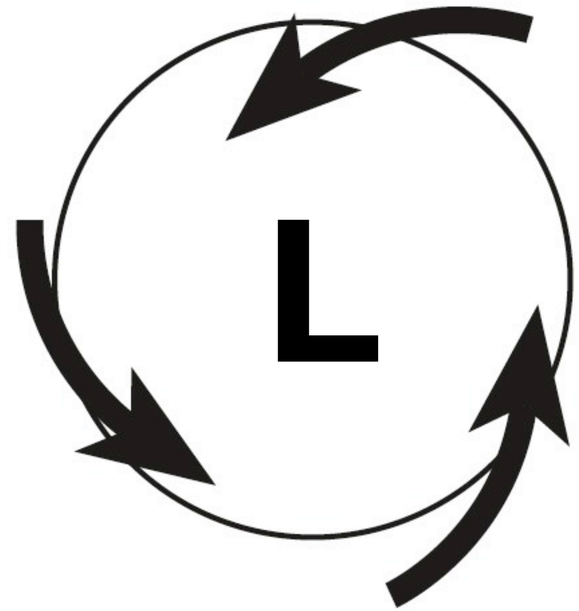
Physical weathering occurs mostly in cold, humid climates (good for ice wedging).



Air moves clockwise and outward around a high.

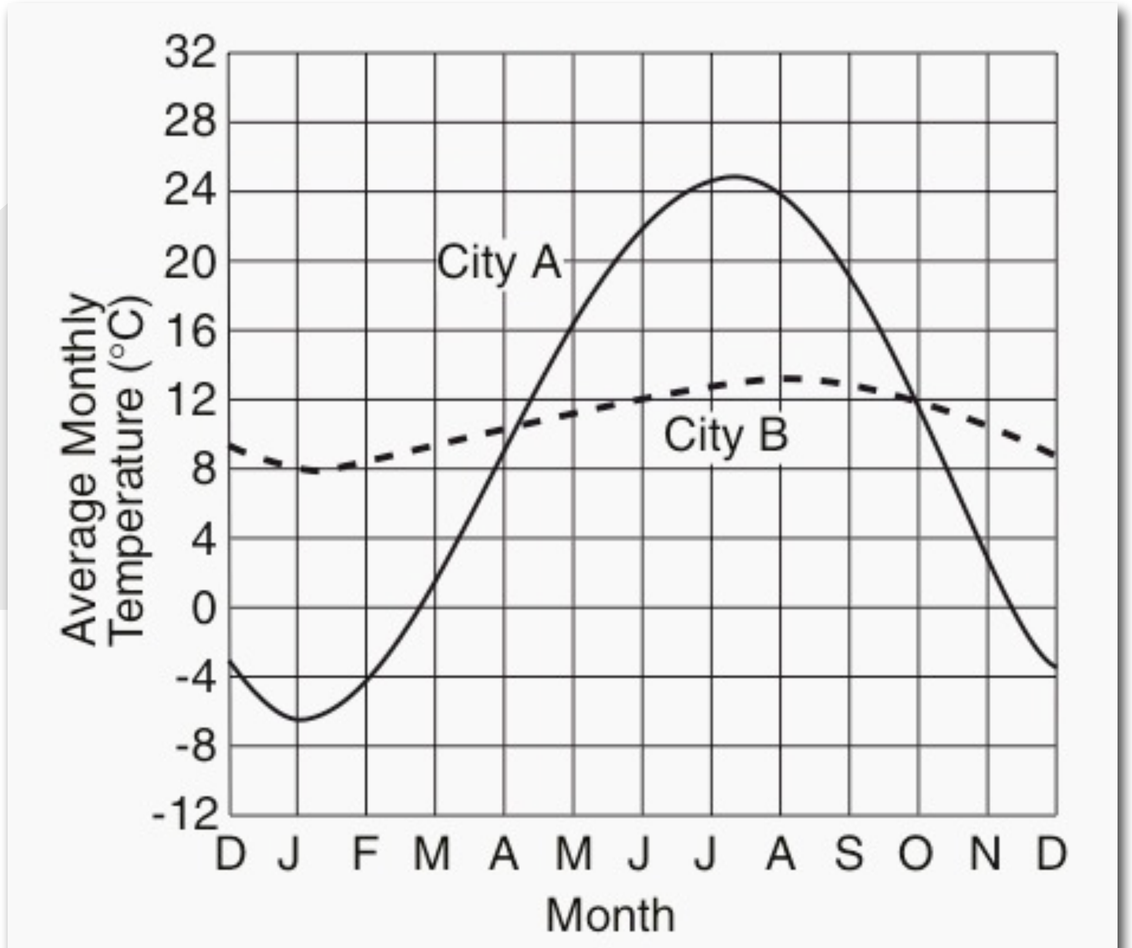


Air moves clockwise and outward around a high.

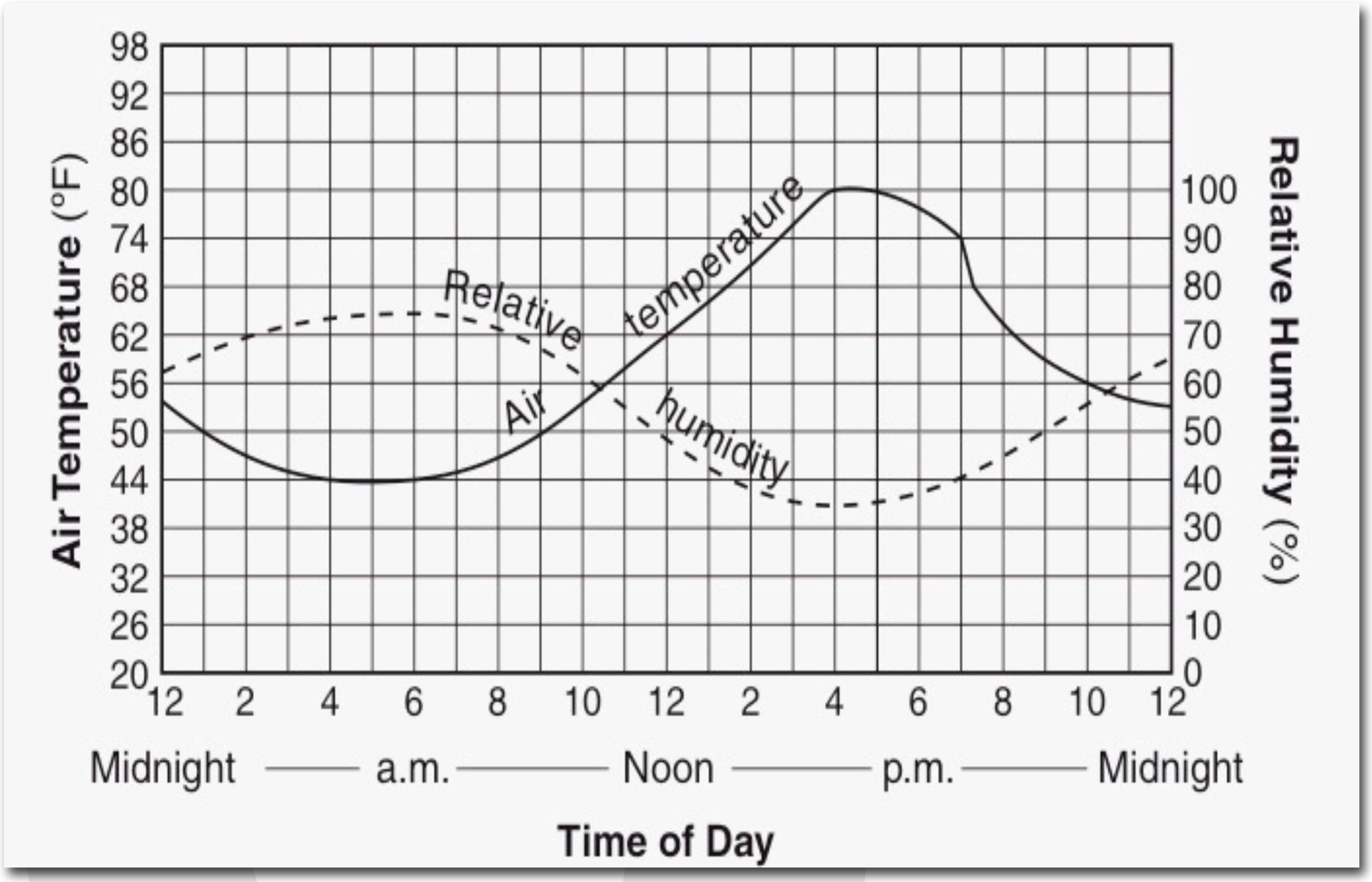


Air moves counterclockwise and inward around a low.

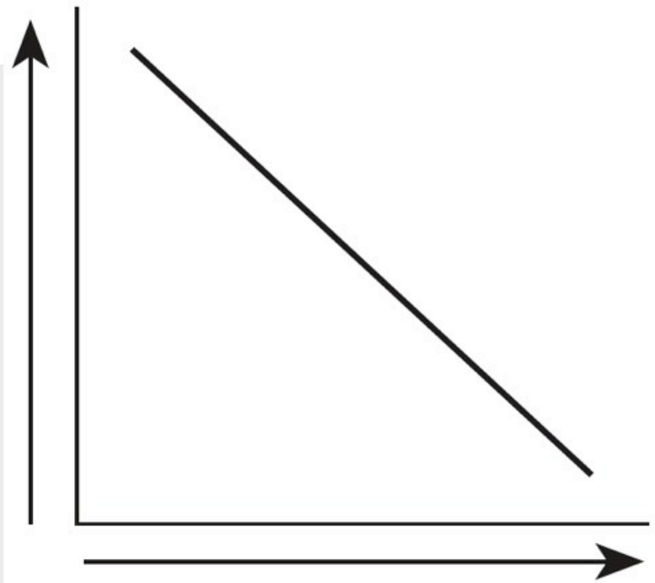
Good absorbers of radiation are good radiators.



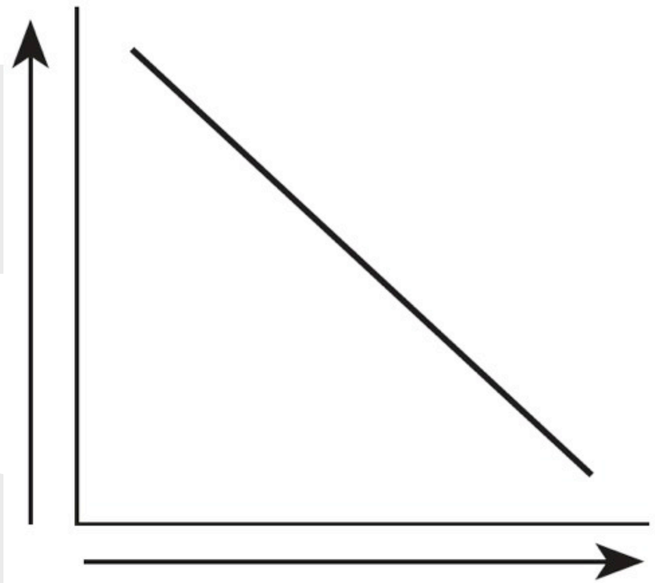
Hottest part of the year is in July.



Hottest part of the day is 1pm.



As temperature increases, air pressure decreases.



As moisture increases, pressure decreases.

Air pressure decreases with altitude.

H=Happy

L=Lousy

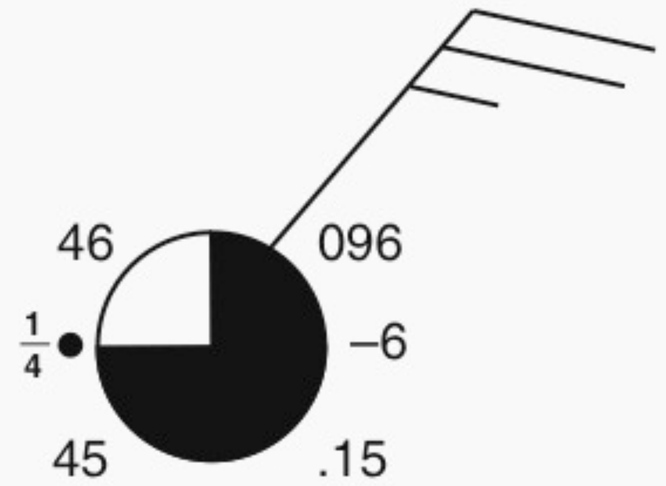
Highs are cool and dry;
lows are warm and wet.

40

Wind is due to air pressure differences.

H TO L

Wind blows from high to low pressure



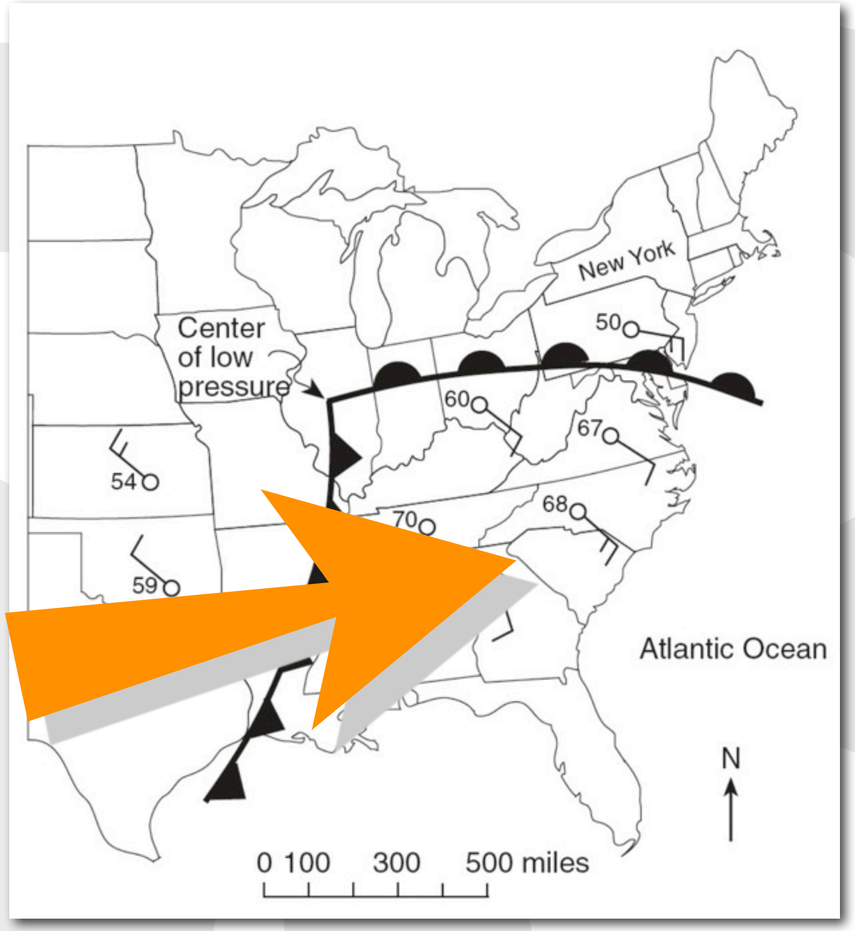
Northeasterly wind

Wind is named from the direction that it is coming from

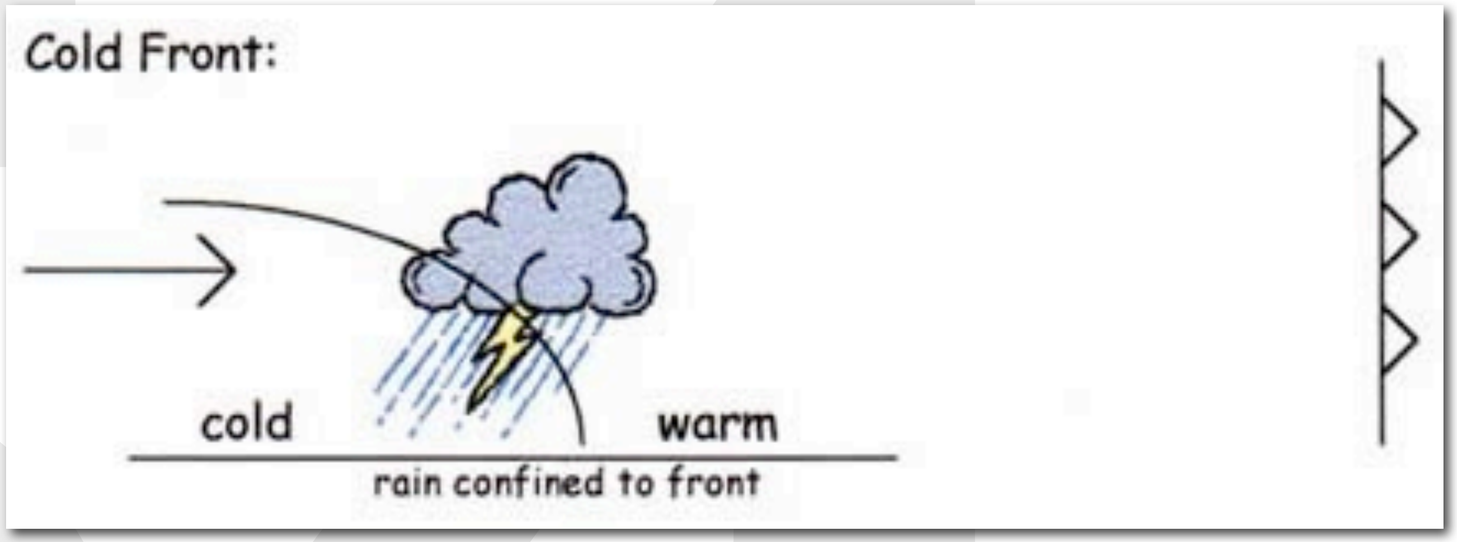
Percent deviation from accepted value	$\text{deviation (\%)} = \frac{\text{difference from accepted value}}{\text{accepted value}} \times 100$

The accepted value is the correct answer, the measured value is the guess.

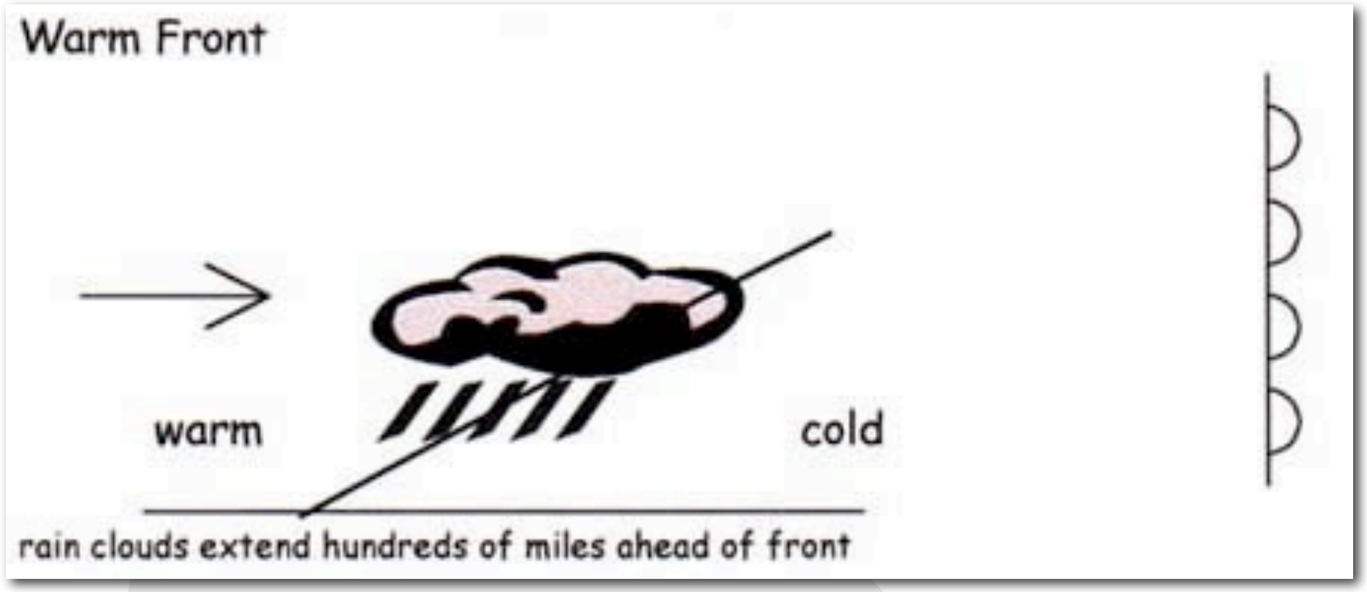
The closer the air temperature is to the dew point the greater the chance for precipitation.



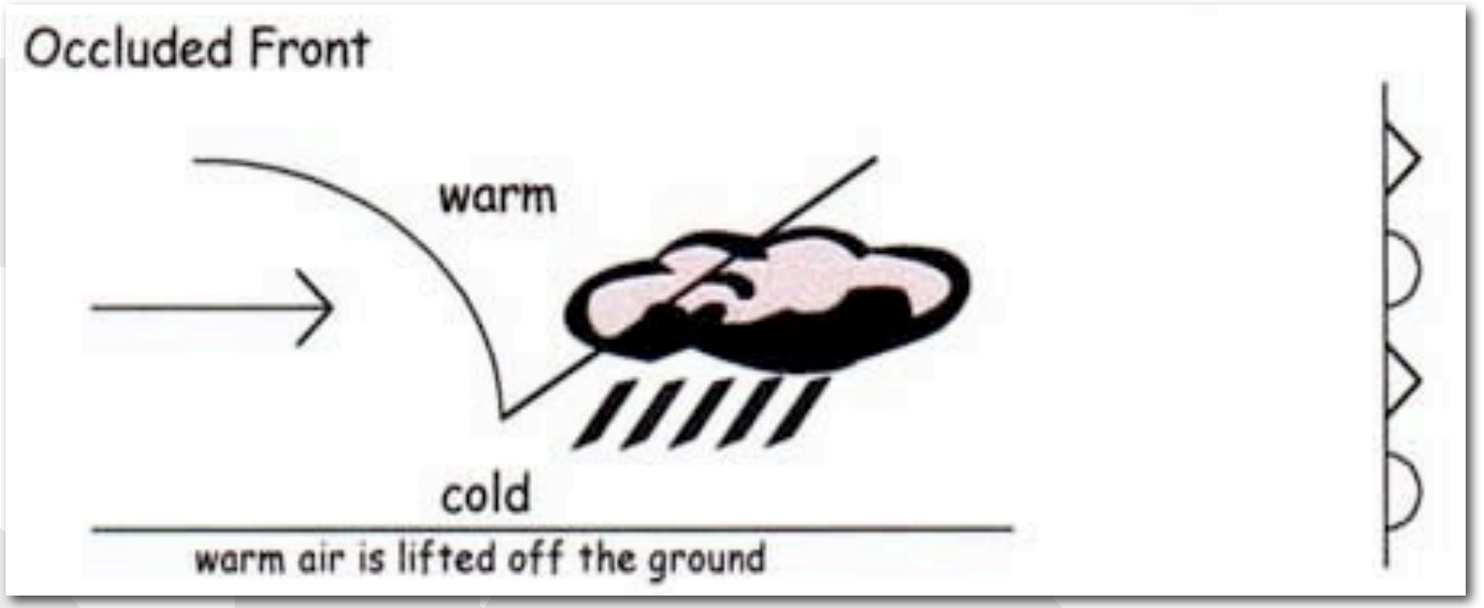
Weather moves from **west** to **east** in the United States



Know your cold front.

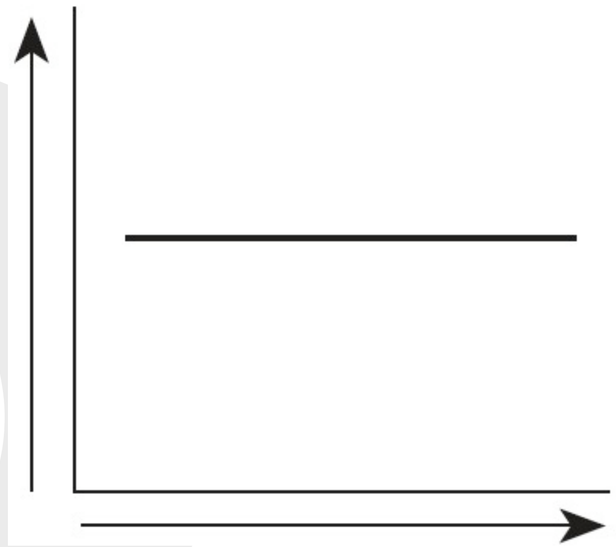


Know your warm front.

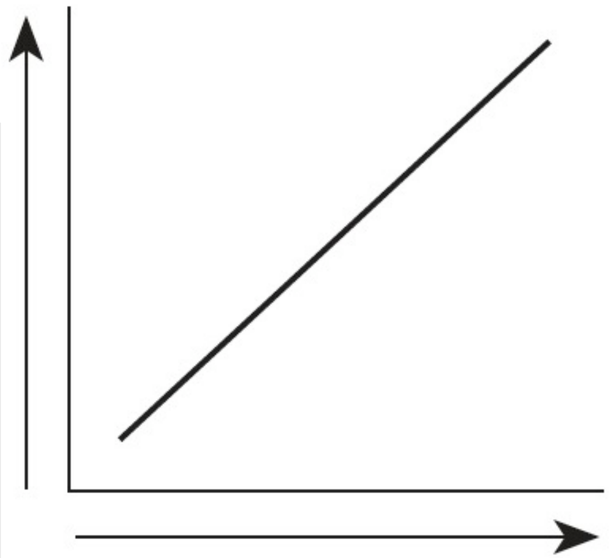


Know your occluded front.

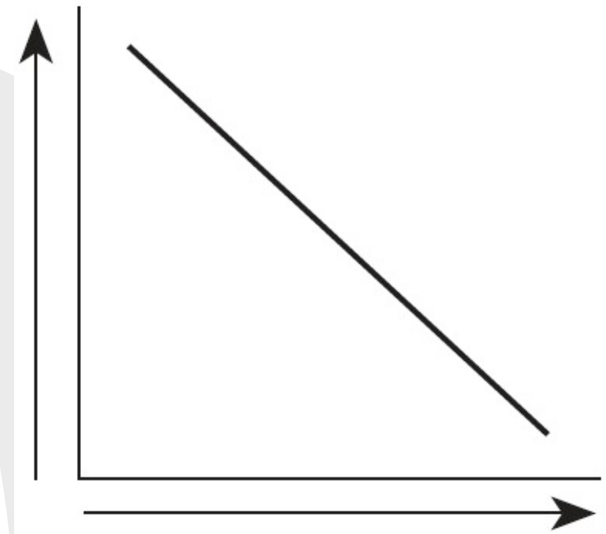
Cold fronts move the fastest



Porosity does not depend on particle size



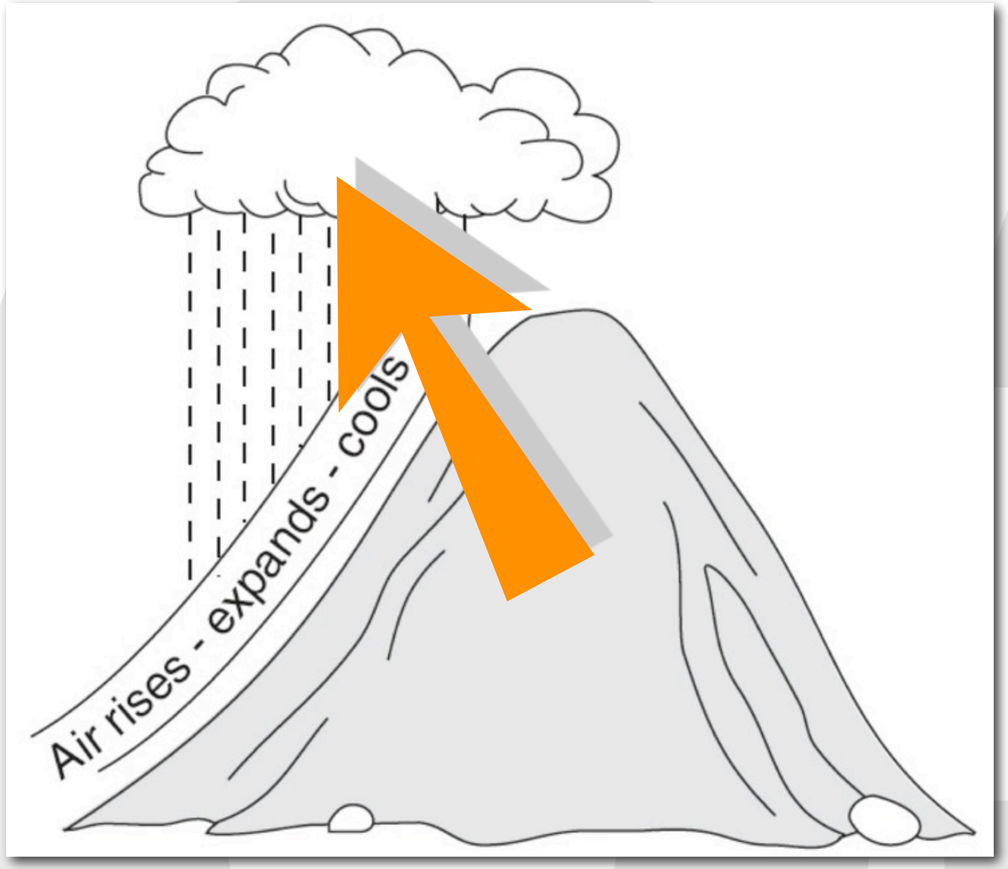
As particle size increases, permeability increases

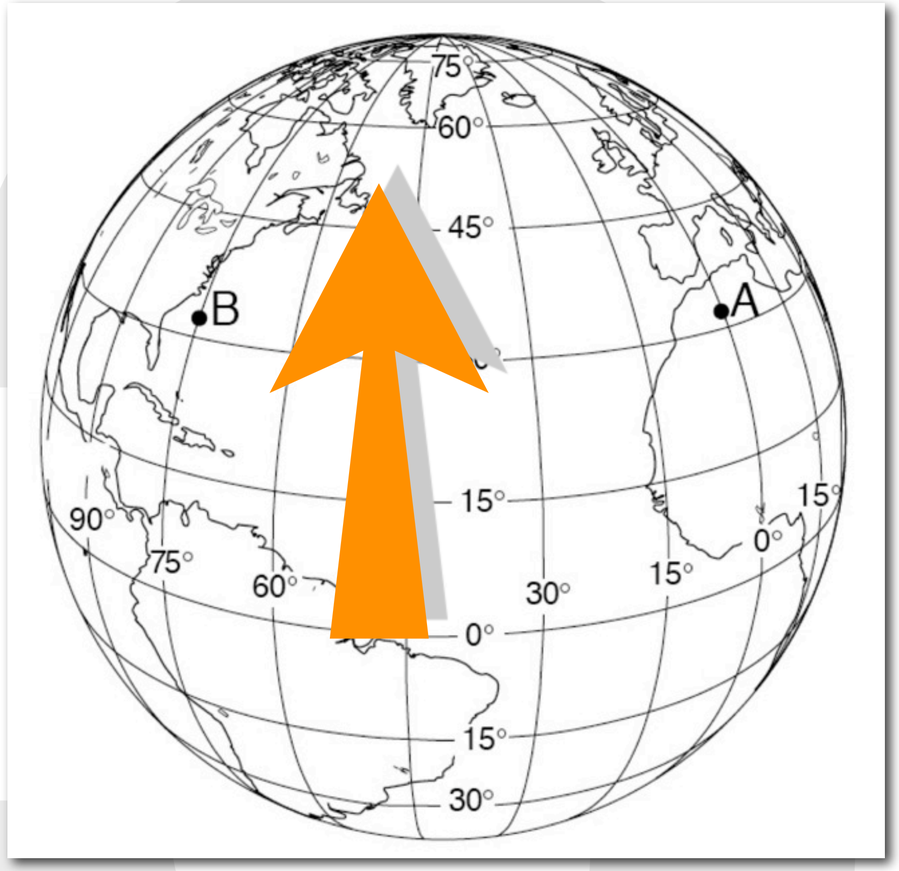


Capillarity increases when particle size decreases

Evapotranspiration depends on temperature

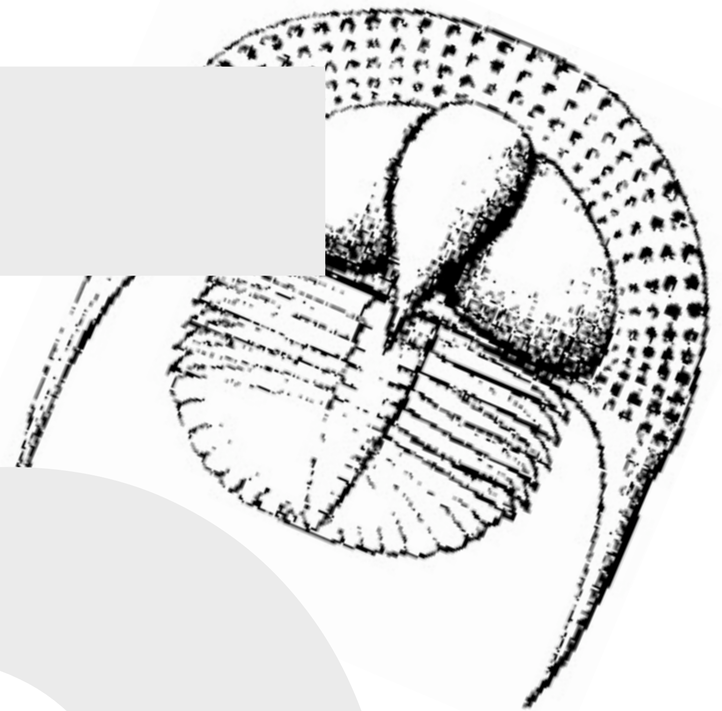
Dynamic equilibrium means balance





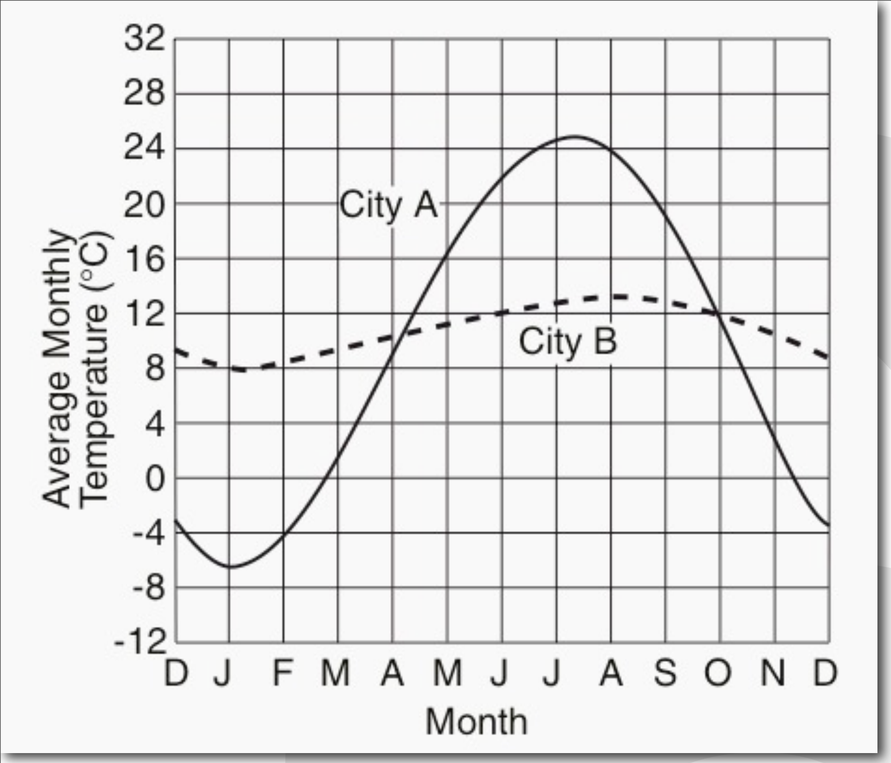
Increase in latitude and altitude have the same affect on climate

Vertical rays (overhead sun) can only occur between 23.5°N and 23.5°S

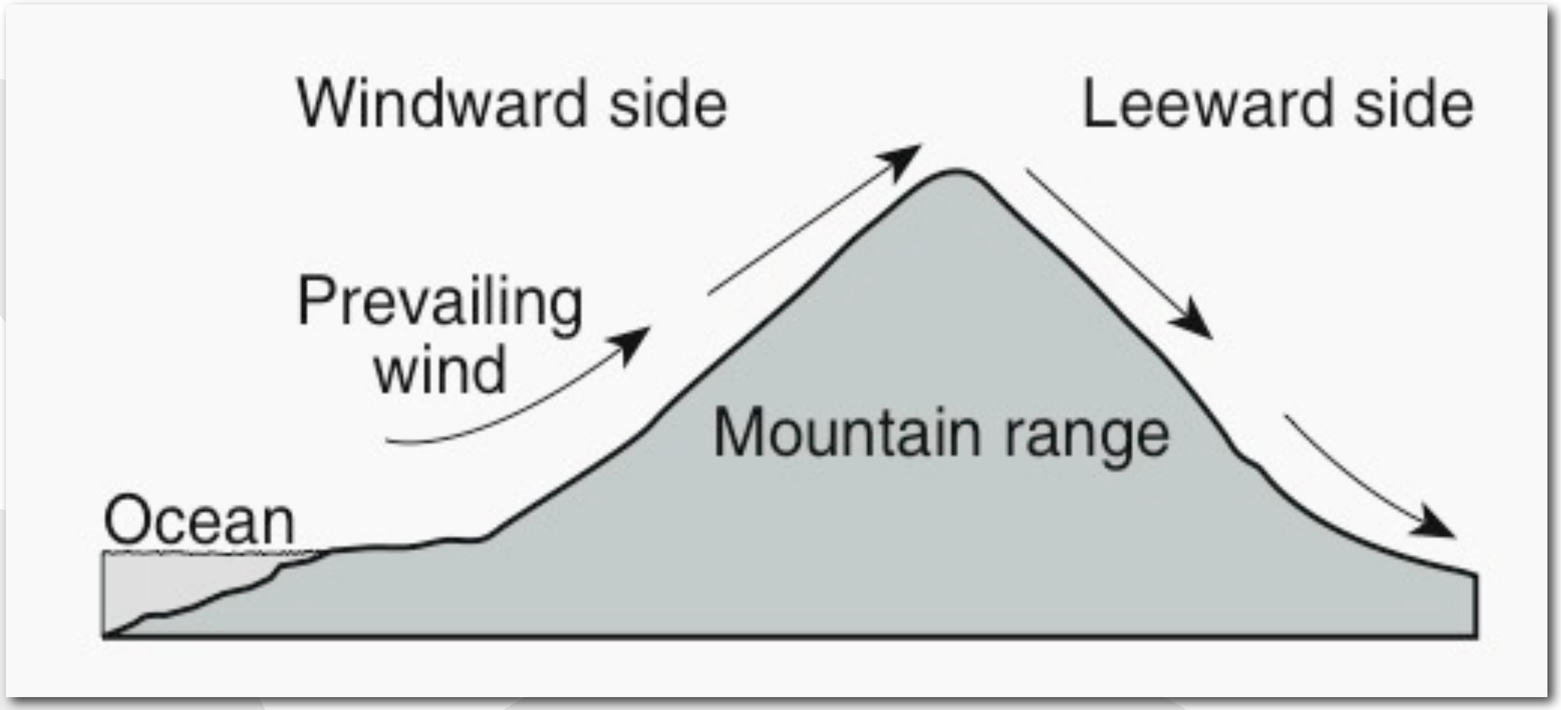


Index fossils are good time markers (widely spread, lived a short time)

Air cools and expands as it rises



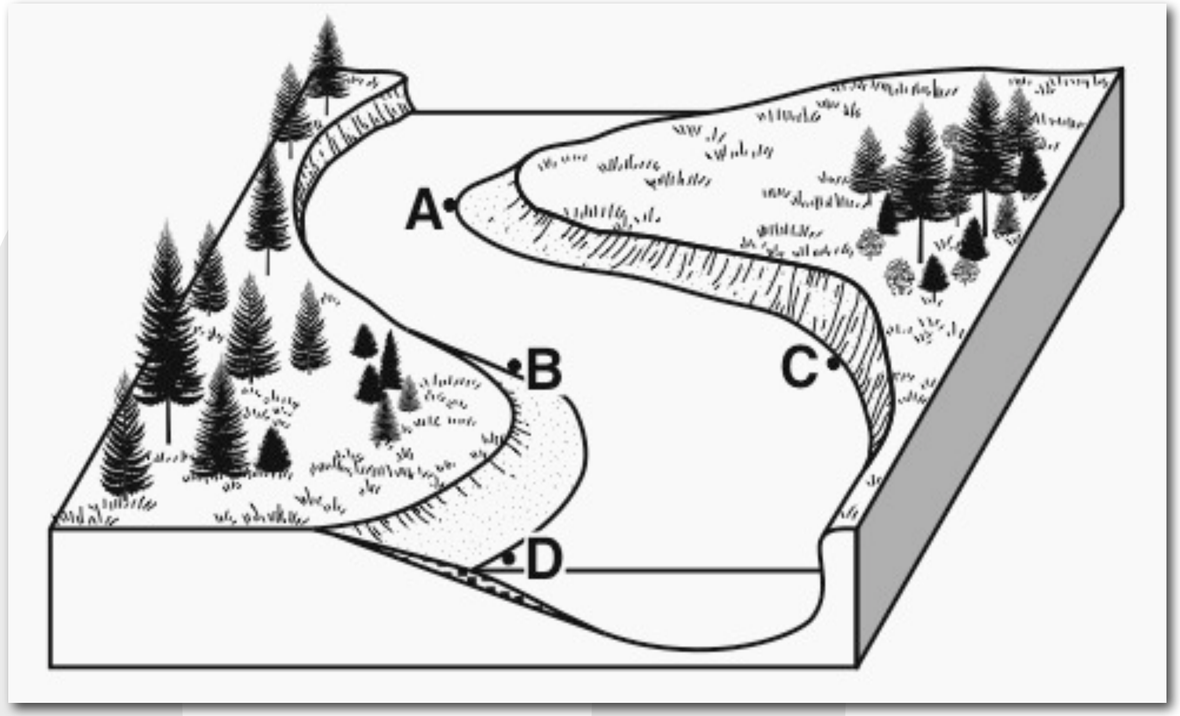
Large bodies of water moderate temperature (smaller temperature range)



Expansional cooling/ Orographic Lifting

09

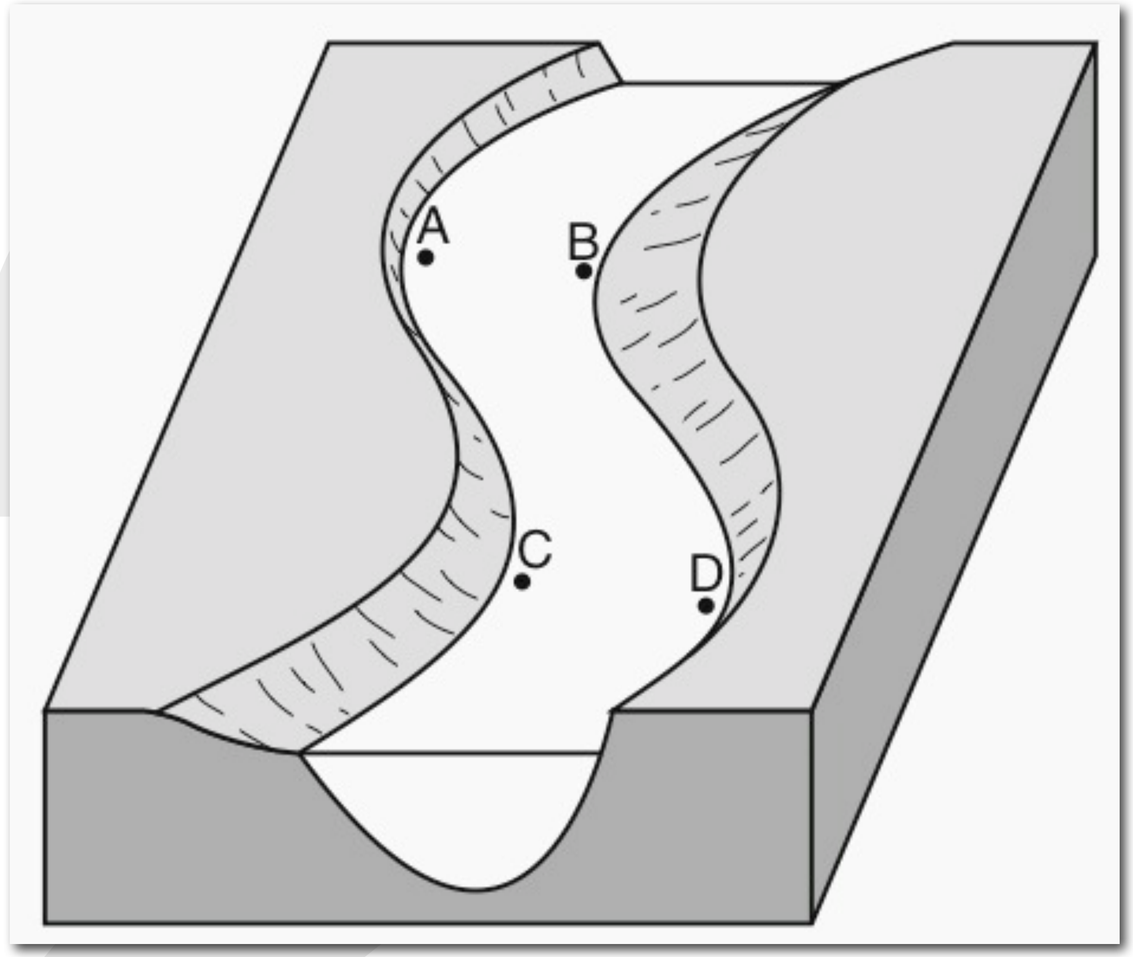
Gravity causes most erosion.



Streams are the number one agent of erosion

71

Stream velocity depends on slope and discharge (amount of water)



Velocity is fastest on the out side of meander bend

Heavy, round, and dense particles settle out first

Graded bedding (vertical sorting): biggest sediments are on bottom

Glacial sediments are unsorted with scratches in a U-shaped valley

Sedimentary rocks may have flat layers, are most likely to have fossils

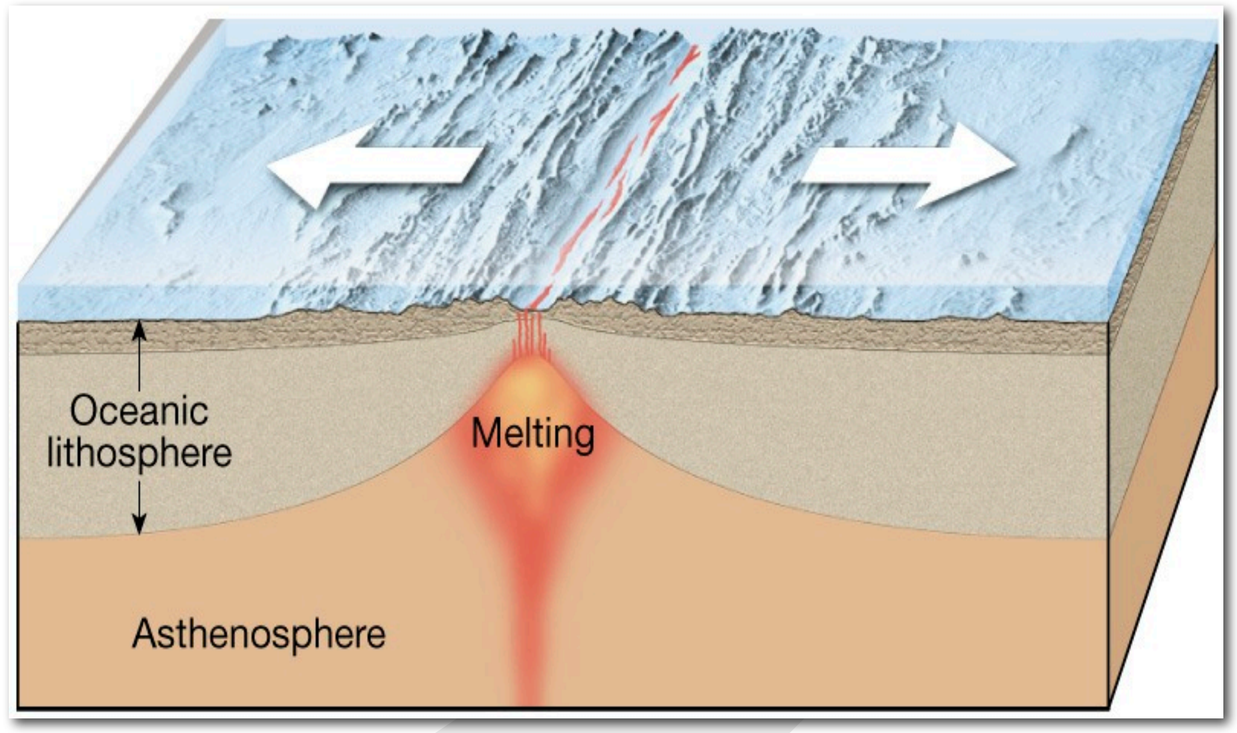
Igneous rocks:
cools fast-small crystals,
cools slow-large crystals

Metamorphic: banded, distorted structure

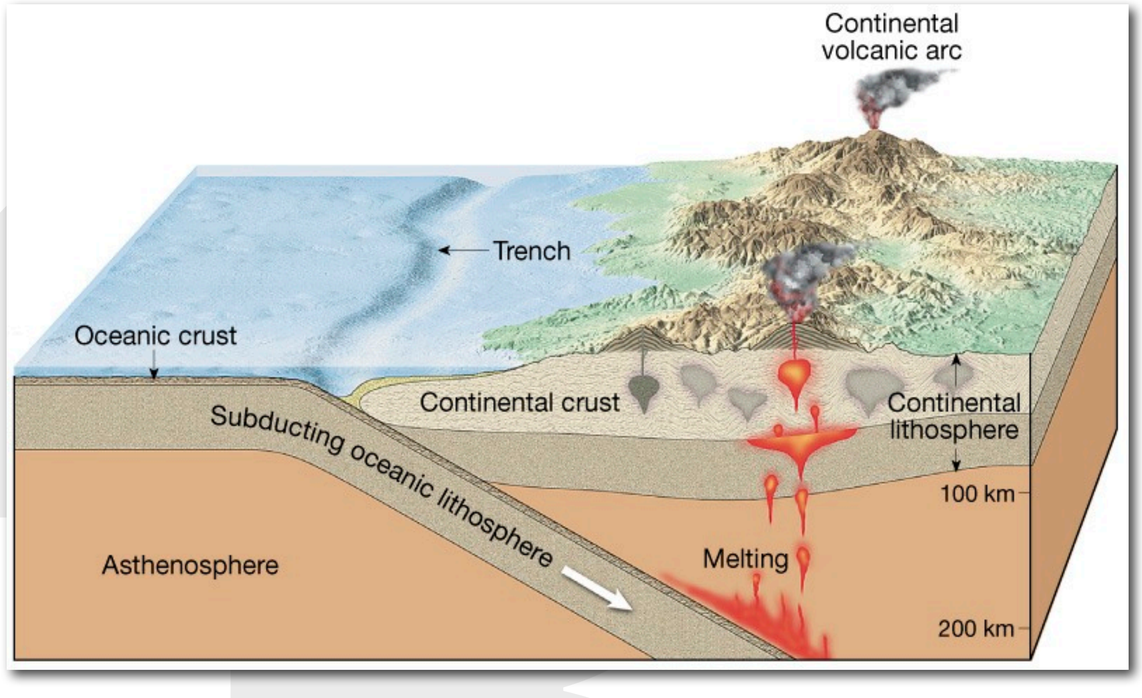
Mineral properties depend on internal atomic arrangement.

Calcite fizzes with acid

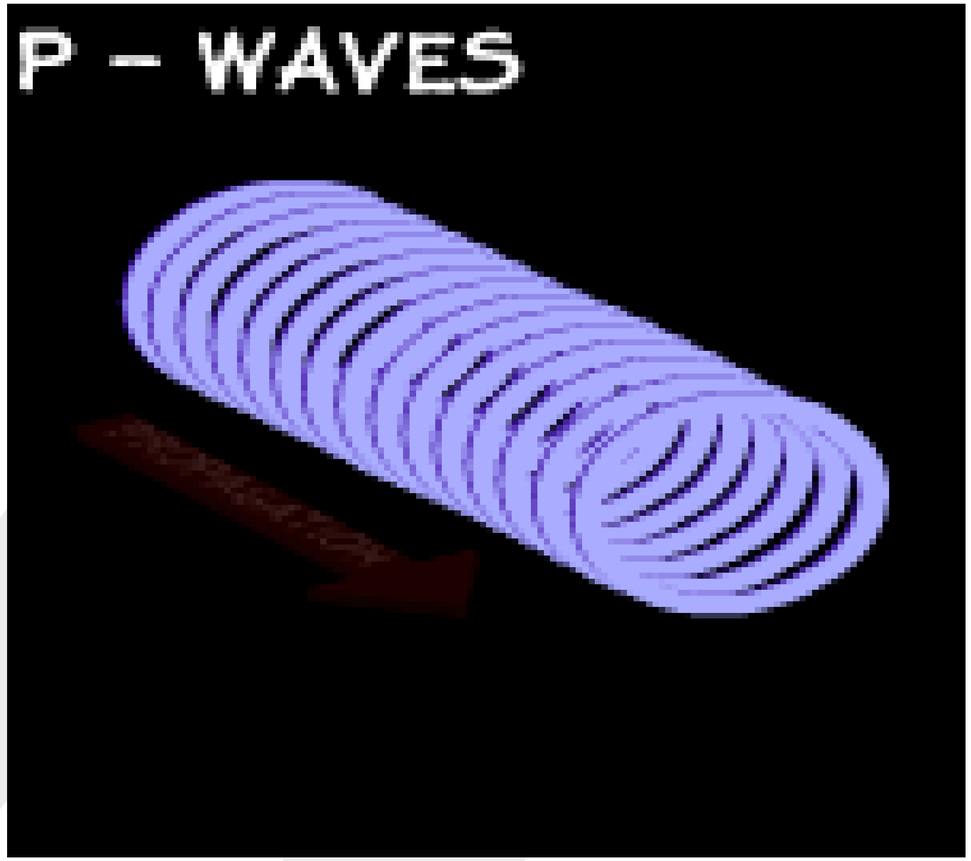
Isostasy: earth's crust in equilibrium (uplift & subsidence).



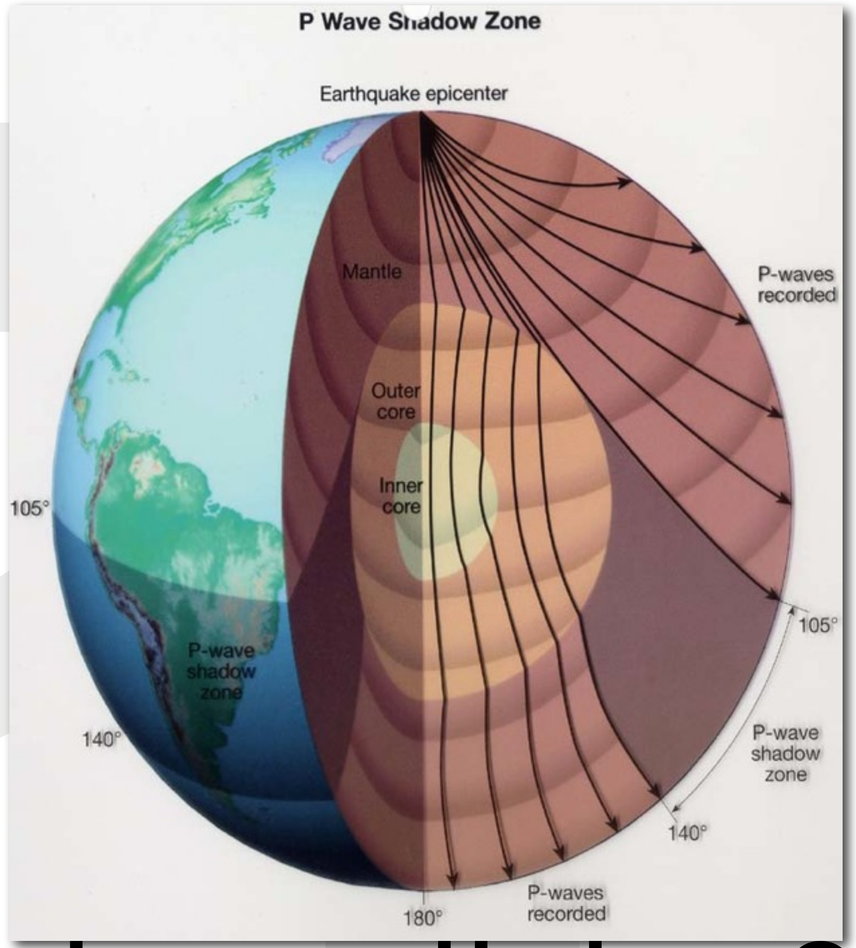
Mid-ocean ridge- New earth being created-sea floor spreading



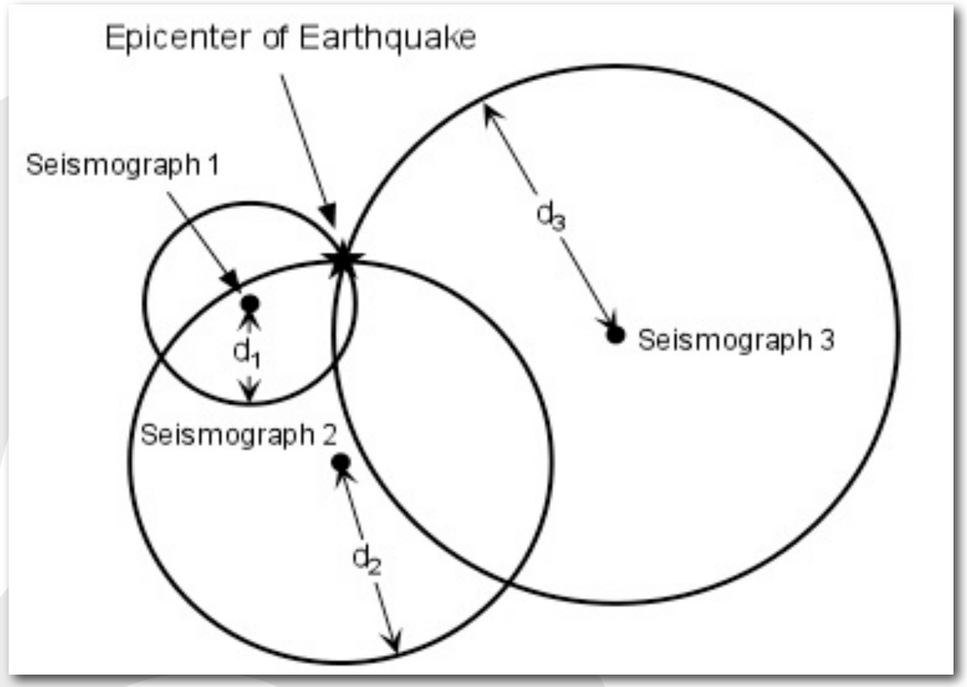
Trenches- Earth being destroyed, subduction zone



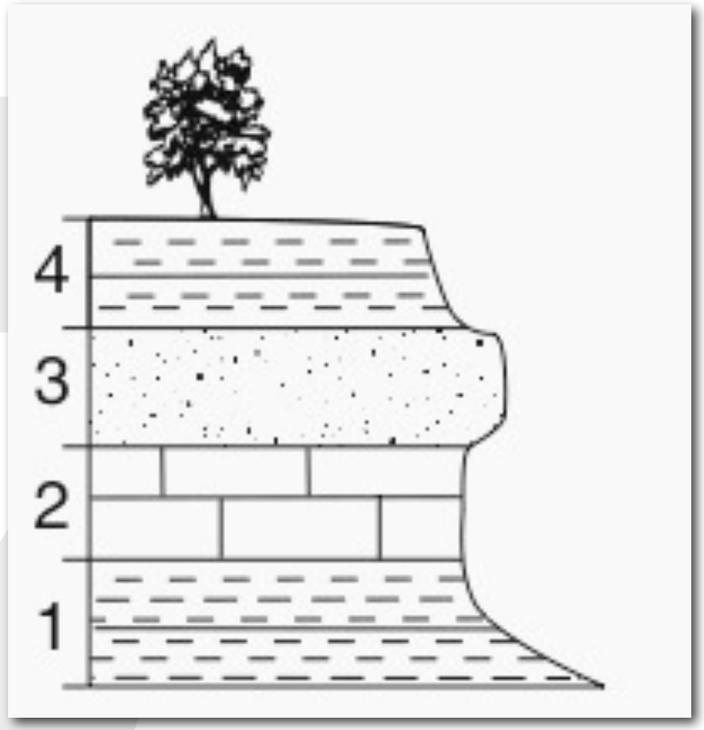
P waves are faster than S waves



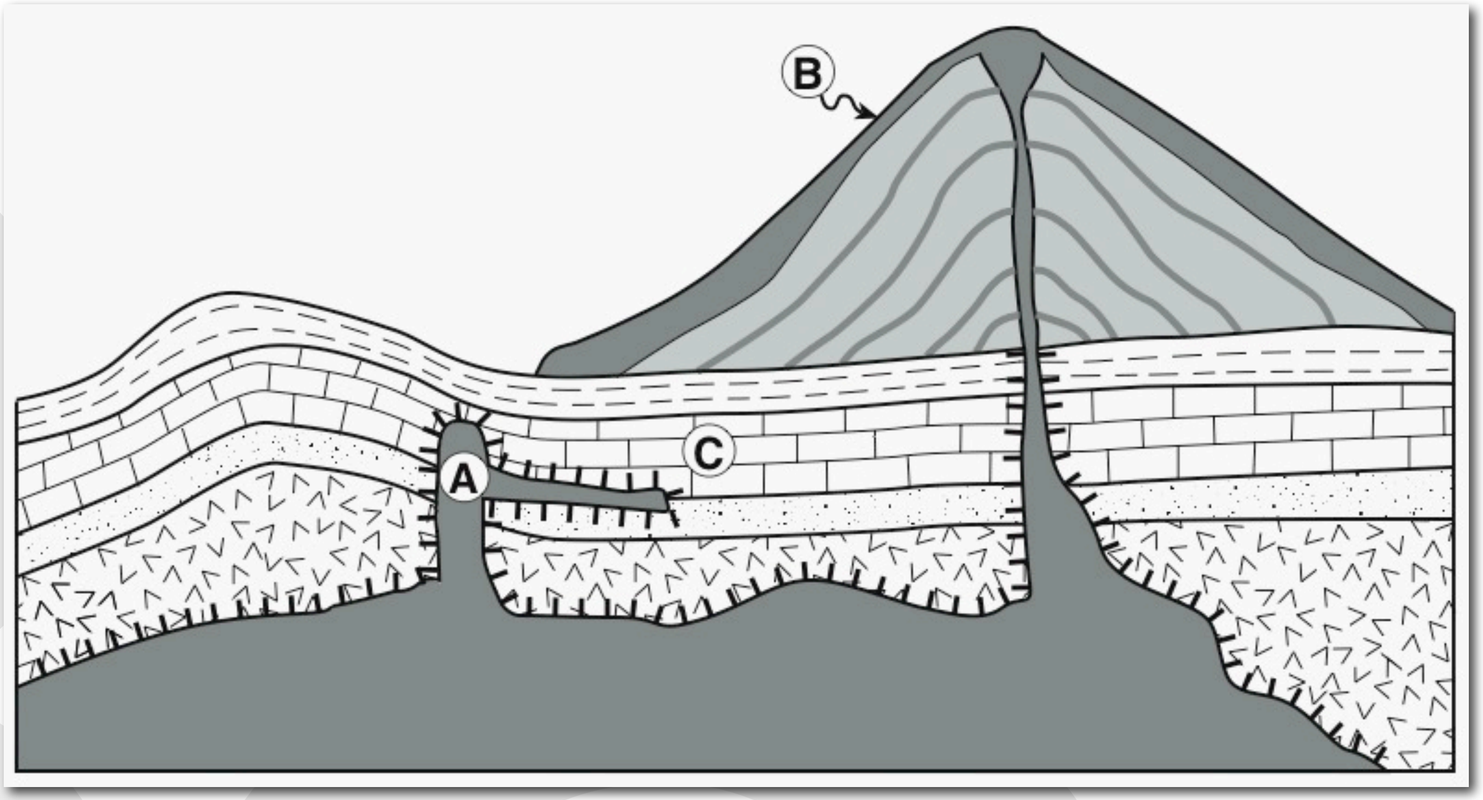
P-waves- Through solids & liquids, S-waves- Through solids only



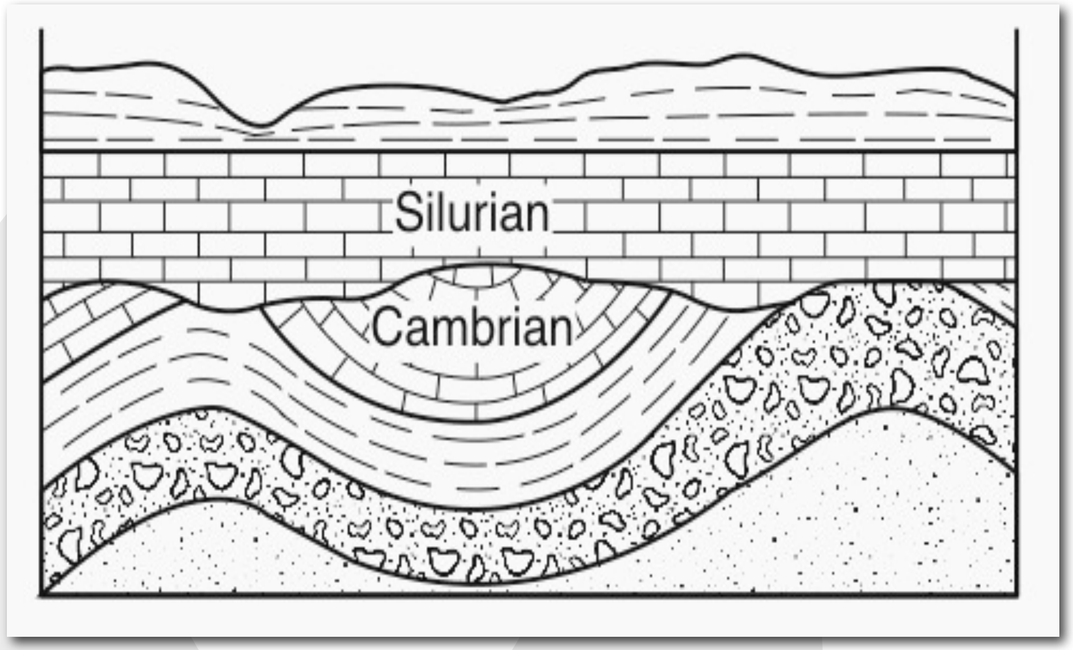
You need 3 seismometer stations to plot an earthquake



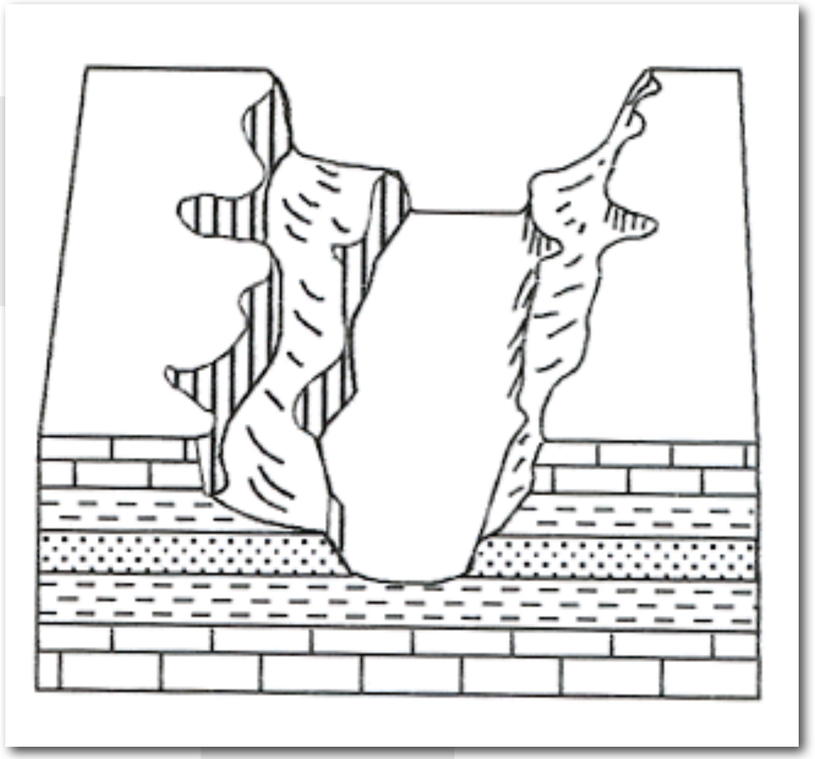
In undisturbed layers, the bottom layer is oldest (Law of Superposition)



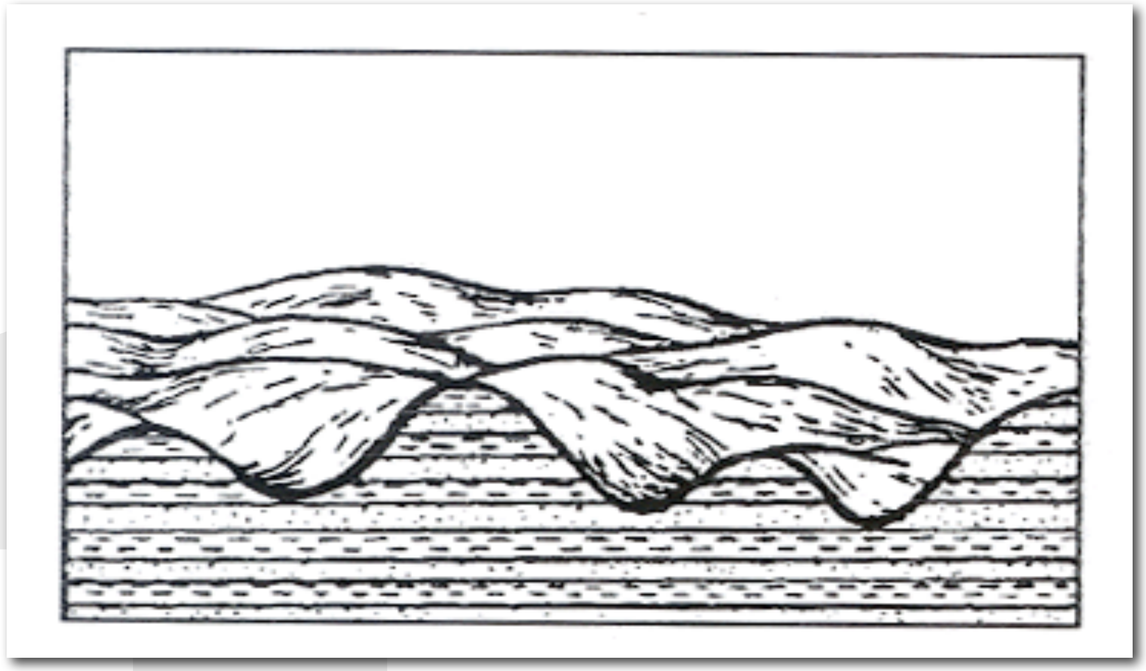
Intrusion and faults are younger than the rock they are in



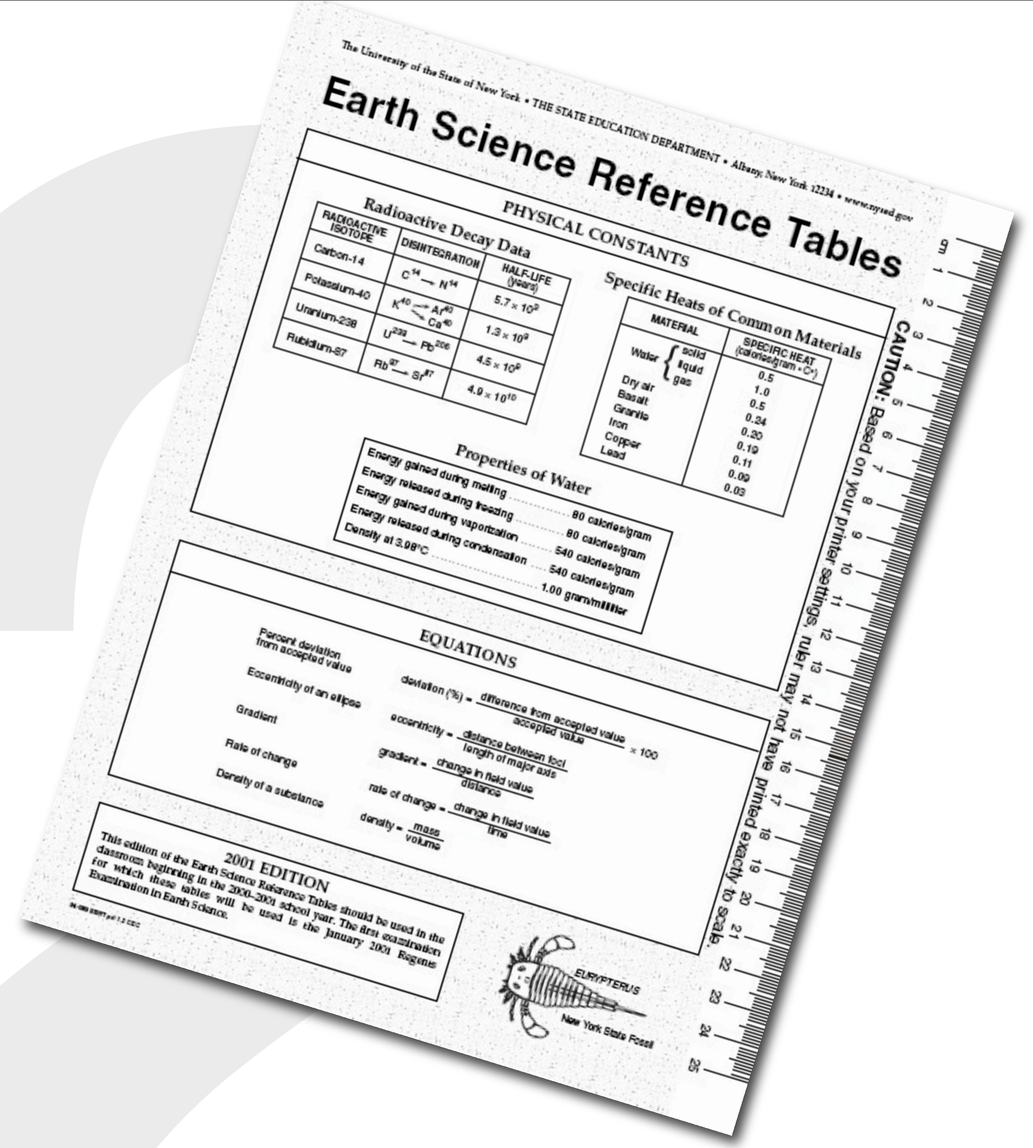
Unconformity means erosion (time gap in the layers)



Arid (dry) landscape: steep slopes with sharp angles



Humid (wet) landscape: smooth with rounded slopes


The University of the State of New York • THE STATE EDUCATION DEPARTMENT • Albany, New York 12234 • www.nysed.gov

Earth Science Reference Tables

PHYSICAL CONSTANTS

Radioactive Decay Data

RADIOACTIVE ISOTOPE	DISINTEGRATION	HALF-LIFE (years)
Carbon-14	$C^{14} \rightarrow N^{14}$	5.7×10^{3}
Potassium-40	$K^{40} \rightarrow Ar^{40}$ / $K^{40} \rightarrow Ca^{40}$	1.3×10^{9}
Uranium-238	$U^{238} \rightarrow Pb^{206}$	4.5×10^{9}
Rubidium-87	$Rb^{87} \rightarrow Sr^{87}$	4.9×10^{10}

Specific Heats of Common Materials

MATERIAL		SPECIFIC HEAT (calories/gram • C°)
Water	solid	0.5
	liquid	1.0
	gas	0.5
Dry air		0.24
Basalt		0.20
Granite		0.19
Iron		0.11
Copper		0.09
Lead		0.03

Properties of Water

Energy gained during melting	80 calories/gram
Energy released during freezing	80 calories/gram
Energy gained during vaporization	540 calories/gram
Energy released during condensation	540 calories/gram
Density at 3.98°C	1.00 gram/milliliter

EQUATIONS

Percent deviation from accepted value: $\text{deviation (\%)} = \frac{\text{difference from accepted value}}{\text{accepted value}} \times 100$

Eccentricity of an ellipse: $\text{eccentricity} = \frac{\text{distance between foci}}{\text{length of major axis}}$

Gradient: $\text{gradient} = \frac{\text{change in field value}}{\text{distance}}$

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

Density of a substance: $\text{density} = \frac{\text{mass}}{\text{volume}}$

2001 EDITION

This edition of the Earth Science Reference Tables should be used in the classroom beginning in the 2000–2001 school year. The first examination for which these tables will be used is the January 2001 Regents Examination in Earth Science.

EURYPTERUS
New York State Fossil

CAUTION: Based on your printer settings, ruler may not have printed exactly to scale.

When in doubt, see if the reference tables will help

Uranium 238 is used to date old rocks

Carbon 14 is used to date recent living objects

Convection currents in the mantle move plates

Always try to eliminate two answers

When a rock is broken into smaller pieces, surface area increases and weathering rate increases

Use complete sentences for the free responses

Be familiar with this chart:

Date	Latitude of Sun's Direct Rays	Direction of Sunrise/ Sunset	Altitude of Noon Sun	Length of Daylight
Sep. 23 (Autumnal Equinox)	Equator (0°)	Rises due east Sets due west	48°	12 hours
Dec. 21 (Winter Solstice)	Tropic of Cancer (23.5°N)	Rises in SE Sets in SW	28.5° (lowest)	8 hours (shortest day)
Mar. 21 (Spring Equinox)	Equator (0°)	Rises due east Sets due west	48°	12 hours
June 2 (Summer Solstice)	Tropic of Capricorn (23.5°S)	Rises in NE Sets in NW	71.5° (highest)	16 hours (longest day)

HINTS FOR TAKING THE REGENTS EXAM AND DOING BETTER

100. USE THE REFERENCE TABLES!

101. Relax--You've already completed 15% of the exam.

102. Be sure to answer every question. At the end, if you have no idea, take a guess.

103. Take your time. You have three hours to do the exam

104. Read introductory paragraphs and study diagrams before looking at questions. Underline key words.

105. Draw diagrams to help you visualize the questions asked - where possible

106. Use a straight-edge to read graphics, to mark points on a graph and to measure distances.

107. If certain words cause confusion, cross them out and substitute a different word, then read the question again. (example: substitute the word "false" for "not true")

108. Don't leave any questions blank

109. Read all choices before deciding on an answer, sometimes a question has a good and a better answer. Always choose the best answer.

110. If you are not sure of an answer, try to eliminate choices that you think are clearly wrong and narrow down your choices. Then make your most careful guess.

111. Ask yourself: Is it in the reference tables, or can the reference tables help me?

112. Check your test a second time, but only change an answer if you find an obvious mistake. Your first choice is usually correct.

113. Look up formulas, even if you think you know them. Substitute information from the question into the formula. Most are on the front page of the reference tables.

114. Skip over hard questions that are stumping you. Go back to them later. Something else in the test may give you a clue to the harder problems.

115. Have a healthy meal for dinner the night before.

116. A good night sleep is as important as the above 115 items.

117. Relax-you've seen all this stuff before.