- Things to be memorized to pass the Regents

Things to be memorized in Regents:

Topic one:

Density does not change if you cut the matter in half.

Grams=mass, Volume= ml or cubic centimeters

Topic two:

Latitude is measure north or south of equator

Longitude is measure east or west of prime meridian

Latitude = Polaris in North Hem.

Greatest or Least contour line is "the next contour minus or plus one"

Closer the contour lines the steeper the gradient

How to connect isolines and draw a profile

Topic three:

All planets orbit in elliptical paths

Causes distance to star to change through orbit, changes gravity pull, and orbital speed

Larger the mass, greater gravity or closer in distance between two objects, greater gravity

Red shift proves that the universe is expanding, since all light from distant stars and galaxies is shifted to the red end of the spectrum

Revolution is proved by changes in constellations, seasons, revolve by 1 degree per day 360/365 is approx. 1

Stars are born and die, is dependent on mass

Rotation is proved by day/night, Foucault pendulum, coriolis effect, rotate 15 degrees per hour 360/24 is 15

Topic four:

Celestial spheres

Tides are caused by pull between earth, moon, and lesser degree sun

Spring tides, biggest difference between tides, occur during full and new moon. Full and new moon only two phases to get an eclipse. Full moon is lunar and new moon is solar.

Neap tides, smallest difference between tides, occur during first and last quarter.

Moon revolves around earth in 27.3 (RT), but takes 2 more days to go through all phases

Geocentric- everything revolves around earth

Heliocentric- everything revolves around sun

Topic five:

Electromagnetic spectrum is divided into decreasing and increasing wavelengths (decreasing= (blue) more energy, more heat and increasing= (red) less energy, less heat)

Ultraviolet, short wavelength (daytime radiation) and infrared, long wavelength (night time radiation) This causes green house effect when infrared is absorbed by water vapor and carbon dioxide (CO_2)

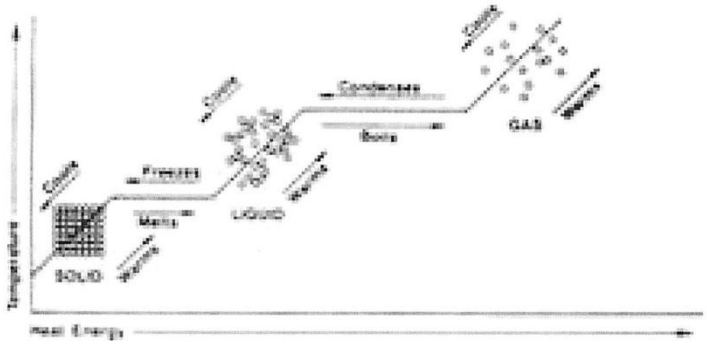
Transfer of energy is when potential (height) energy is transferred to kinetic (movement) energy, and vice versa

Heat energy is transferred by convection, conduction, and radiation.

Convection is due to differences in density

Conduction is based on specific heat

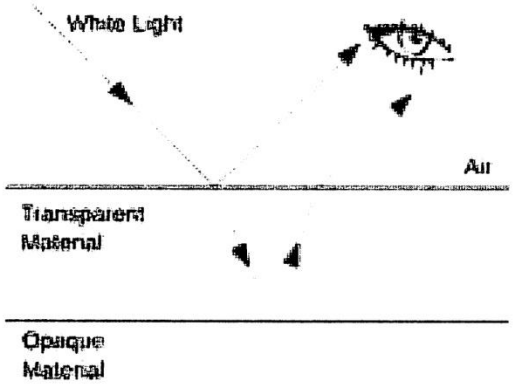
Radiation is based on wavelength



*Diagonals are in the phase, flat lines represent phase change.

Heat energy is absorbed during melting and evaporation

Heat energy is released during freezing and condensation



Reflective bounces light back and refraction bends light

Light colors reflect heat energy and dark colors absorb heat energy

Topic Six:

Insolation is incoming solar radiation that changes intensity by the angle of incidence. Higher angle of incidence, the more heat and lower angle of incidence, the less heat.

Suns direct ray is at equator (0) for 3/21 and 9/21, Tropic of Cancer (23.5 N) for 6/21 and Tropic of Capricorn (23.5S) for 12/21.

Reasons for seasons is tilt, revolution, insolation, and tilt staying parallel during orbit

Diagrams with earth tilted towards sun = summer

Diagrams with earth tilted away from sun = winter

Fall and Spring are determined by the seasons on each side

Daylight hours increase for whatever hemisphere the sun's direct ray is in (North Pole 24 in summer and 0 in winter vice versa for South Pole) Equator get 12 hours year round

Topic seven:

Station models are in reference table except for barometric pressure.

If the three digit number on the station model is above 500, put a 9 in front. If the number is below 500 put a 10 in front.

If given a correct barometric pressure and asked to put on station model, take last three numbers and remove decimal

High pressure systems move SE across the US, they have clock-wise winds in an outward fashion and bring fair weather (NO FRONTS)

Low pressure systems move NE across the US, they spin counter-clockwise and have inward air and bring precipitation, due to fronts

Warm air rises and expands, therefore cooling to the dew point which causes condensation and precipitation. Cool air sink and compresses, therefore warming and having less humidity. Mountain problem: windward side has lush green vegetation, from the side with wind, leeward side has desert conditions.

Instruments for weather:

Barometer- pressure

Thermometer- temperature

Wind vane- wind direction

Anemometer- wind speed

Rain gauge- amount of rain

Psychrometer- humidity

wet (wet sock) and dry bulb

When air temperature and dew point are close to each other in degrees the relative humidity is high and vice versa

On a weather map the closer the isobars (barometric pressure) the faster the winds

Sea breeze during day, due to land heating up faster (because of specific heat), breeze is towards shore

Land breeze during night, due to water retaining heat longer (because of specific heat), breeze is towards water

Pressure belts- poles have constant High pressure due to deep cold air, and equator has constant Low pressure due to very warm air. Sets up a convection current that begins global winds. Global winds bend to the right in N Hemisphere and left in S Hemisphere.

Hurricanes (originally track NW during development)and Tornadoes track towards NE due to having low pressure centers, You get days of warning for hurricanes and 5-15 minutes for a tornado

Topic eight:

Water cycle- evaporation, condensation, precipitation, and either runoff or infiltration

Runoff vs. infiltration-what conditions either allow water to seep (infiltration) into soil or be forced to move along ground (runoff)

POROSITY DOES NOT CHANGE DUE TO SIZE OF PARTICLE!!!!!! (TAP DANCE)

Porosity is affected by shape, sorting, and packing of particles. Round shape particles have the highest porosity, angular have lower porosity.

Sorting is well sorted (all about the same size) verses poorly sorted (all different sizes)

Prevailing winds are due to global wind belts, we live between 30 degrees to 60 degrees N, therefore in the Prevailing Westerlies, which mean that wind travels from W to E across US.

Water table is interface (boundary) between zone of aeration (water and air in pore space) and zone of saturation (water only in pore space)

Capillary is ability of water to attract itself. The closer the particles (finer) to each other the higher elevation of capillary water. The farther apart (coarser) particles to each other the lower the capillary water.

Water budget graphs show us climate, the larger difference between deficit and surplus must be read. Ex. Very large deficit verses surplus means dry climate.

Topic nine and ten:

Weathering- breaking down of material (physical-appearance/chemical-composition)

Erosion- transport of material by wind, water, waves, ice, or gravity

Deposition- leaving material behind after erosion, some features such as drumlins, sand dunes, etc. show direction of movement

Glaciers always move from North areas to South areas

Groins are built to slow down water before the beach, the deposition happen most on the side first in contact with long shore current

Topic eleven:

Sedimentary rocks have fossils in them

Organic means has lived before, inorganic has not

Compounds cannot be taken apart, but mixtures can

First rock on earth was igneous, still has greatest % when considering whole earth, however sedimentary rocks cover 75% of earths surface

Topic twelve:

Earthquake, then P-wave will arrive, then S-wave. E to P to S, add time, when you go S to P, E subtract time.

Continental Drift was theory that all continents were once connected, evidence was fossils, rocks, and mountain chains that match up between South America and Africa.

Plate Tectonics states that plates move and continents ride on them, which is proved by the Mid-Atlantic Ridge, convergent and strike-slip (transform faulting) plate boundaries.

Reversed and normal polarity at Mid-ocean ridges prove that the plates are moving apart (diverging). Always match each other on each side of ridge.

All rocks are younger at Mid-Ocean ridges and get older as you move away from ridge

Safety precaution for earthquakes has to happen before earthquake, due to no warning. For volcanoes, you have days notice to prepare.

P waves travel through solids and liquids, S waves only travel though solids. This is how we know that the outer core is liquid, because S waves will not travel through.

Shadow zones occur at 102-143 degrees away from the earthquake epicenter due to refraction of P waves and S waves not traveling through liquids

Epicenter is on surface of earth above focus, and focus is below ground where the rocks actually break

Topic thirteen:

Law of superposition states that the oldest layer is on bottom, unless overturned

Law of cross-cutting states that whatever crosses or dissects layers is younger than the layers (look for contact metamorphism)

Law of original horizontality states that all rock layers are deposited flat. Later they can be tilted, folded, faulted, etc.

Index fossils must have lived for a short period of time over large geographic area

Carbon-14 is used for organic remains and good for about 70,000 years

Earth has had many atmospheres before today. Gasses such as hydrogen and helium were lost due to outgassing, they were too light for our gravitational pull.

- 117 ways to pass the Regents

117 Ways to Pass the Earth Science Regents

1. The same substance always has the same density

2.As pressure increases, density increases

3.As temperature increases, density decreases

4.Water expands when it freezes

5.Most changes are cyclic

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

7.The true shape of the Earth is an Oblate Spheroid, but from space it looks like a sphere.

8.The best model of the Earth is a sphere

9.The altitude of Polaris equals your latitude

10.To determine the earth's circumference, the altitude of the sun is needed at two locations

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

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

13.Longitude is based on observations of the sun

14.Use the reference tables

15.The closer the isolines (contour-isobar-isotherms-) are the steeper the slope or gradient

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

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

18.All celestial objects appear to move west

19.The moon has phases because of the angle at which we view it (remember though that half is always lit)

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

21.Summer solstice is June 21st

22.Winter solstice is December 21st

23.Equinoxes: March 21st September 23rd

24.Equator always has 12 hours of day-light

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

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

27.Earth is closer to the sun in file winter

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

31.Black absorbs/white reflects

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

33.Ocean crust is thin and made of basalt

34.Continental crust is thick and made of granite

35.Energy moves from source to sink: high to low

36.Mountains form by uplift

37. Chemical weathering occurs mostly in warm, humid climates

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

39.Air moves clockwise and outward around a high

40.Air moves counterclockwise and inward around a low

41.Good absorbers of radiation are good radiators

42.Hottest part of the year is in July

43.Hottest part of the day is after 1:00p.m.

44.As temperature increases, air pressure decreases

45.As moisture increases, pressure decreases

46.Air pressure decreases with altitude

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

48.Wind is due to air pressure differences

49.Wind blows from high to low pressure

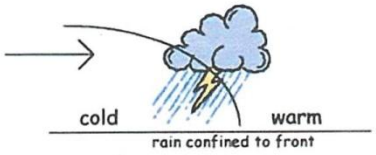
50.Wind is named from the direction that it is coming from

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

52.The closer the air temperature is to the dew point the greater the chance forprecipitation

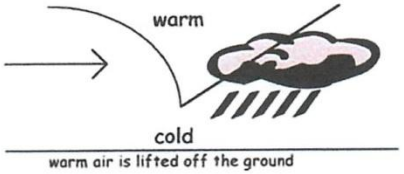
53.Weather moves from west to east in the United States

54. Cold Front:



55. Warm Front

56. Occluded Front



57.Cold fronts move the fastest

58.Porosity does not depend on particle size

59.As particle size increases, permeability increases

60.Capillarity increases when particle size decreases

61.Ep (potential evapotranspiration) depends on temperature

62.Dynamic equilibrium means balance

63.Apparent diameter of objects (sun, moon) gets larger when the object is closer to Earth

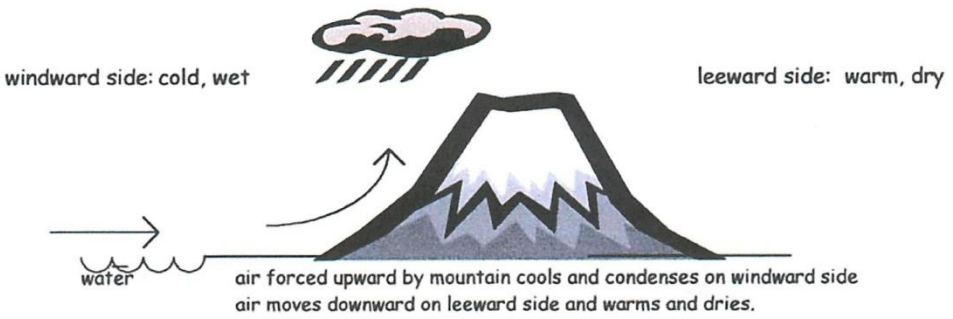
64.Vertical rays (overhead sun) can only occur between 23 1/2 °N and 23 1/2 °S

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

66.Air cools as it rises

67.Water bodies moderate temperature

68. Expansional cooling:



69.Gravity causes all erosion

70.Streams are the number one agent of erosion

71.Stream velocity depends on slope and discharge

72.Velocity is fastest on the out side of meander bend

73.Heavy, round and dense particle settle out first Graded

74. Bedding (vertical sorting):biggest sentiments are on bottom

75.Glacial sentiments are unsorted, scratched, U shaped valley

76.Sedimentary rocks - strata - flat layers - most likely to have fossils

77.Igneous rock: cools fast: small crystals; cools slow: large crystals

78.Metamorphic- banded-distorted structure

79.Mineral properties depend on internal atomic arrangement

80.Silicon + oxygen = tetrahedron

81.Isostasy: earth's crust in equilibrium

82.Mid-ocean ridge - new earth being created-sea floor spreading

83. Trenches - earth being destroyed-subduction zone

84.P waves are faster than S waves

85.P waves - solids & liquids can pass through -- S waves solids only

86.You need 3 seismometer stations to plot earthquake

87.Undisturbed strata - bottom layer is oldest

88.Intrusion and faults are younger than the rock they are in

89.Unconformity means erosion

90.Arid landscape:steep slopes with sharp angles

91.Humid landscape:smooth with rounded slopes

92.When in doubt, see if the reference tables will help

93.Uranium ^{235} dates old rocks

94.Carbon ^{14} dates recent living objects

95.Convection currents in the mantle move plates

96.Always try to eliminate two answers

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

98.Use complete sentences for the free responses

99.Be familiarwith this chart:

DATE (APPROXIMATE)	LATITUDE OF SUN'S DIRECT RAYS	DIRECTION OF SUNRISE AND SUNSET	ALTITUDE OF NOON SUN	LENGTH OF DAYLIGHT
Sept. 23 (Autumnal Equinox)	Equator (0°)	Rises due East Sets due West	48°	12 hours
December 21 (Winter Solstice)	Tropic of Capricorn (23 1/2°S)	Rises in SE Sets in SW	24.5° (lowest)	8 hours (shortest day)

March 21 (Vernal Equinox)	Equator (0°)	Rises due East Sets due West	48°	12 hours
June 21 (Summer Solstice)	Tropic of Cancer (23 1/2°N)	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 1/4 of the exam.

102. In part II, choose groups A and B (rocks & minerals, and plate tectonics)

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 back 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.Eat veggies if possible.

116.A good night sleep is as important as the above 112 items.

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

Review guides

- Mr. Papp review guides.

Regents Topic Test # 1 (Mapping the Earth)

Scientific Tools (Balance, Ruler, Graduated Cylinder, Thermometer)

- Scientific Inquiry ,Inference, Observations (Qualitative vs. Quantitative)
- Mass and Weight (why are they different)
- Metric system and conversions. How is the English system different.
- Density (Finding Density, Mass and Volume) Density of water!!!
- Density (What will and will not change it)
- % Deviation a.k.a. % error (what is it, what is the formula)
- Line of Best Fit
- Sunspots
- Earths' Shape, Oblate Spheroid (Flatter on top and bottom, Bulges at the sides)
- Latitude (equator/parallels)/ Longitude (prime meridian/meridians)
- Polaris (Its altitude is your Latitude)
- Time zones and International Date line (360 degrees / 24 hrs = 15 deg/hr)
- Topographic Maps, Contour lines and Profiles
- Fields
- Gravity
- Temperature and Isotherms (Isolines)
- Heat Source / Heat Sink
- Gradient / Rate of Change

Text book pages 1-16, 23-25, 684-691
Review book

Topic 1

- Classification
- Cyclic Change
- Density
- Dynamic Equilibrium
- Inference
- Instrument
- Interface
- Mass
- Measurement
- Natural Hazard
- Natural Resources
- Observations
- Percent Deviation
- Pollution
- Prediction
- Rate of change
- Universe
- Volume
-
-

Topic 2

Atmosphere
Contour Lines
Coordinate system
Crust
Earth Interior
Elevation
Equator
Field
Gradient
Hydrosphere
Isoline
Latitude
Lithosphere
Longitude
Meridian of Longitude
Model
Pause (of atmosphere)
Prime Meridian
Profile
Topographic Map

Regents Topic Test # 2 (Earth in Space)

- Big Bang and the creation of the Universe
- Doppler Effect (Red & Blue Shift)
- Creation of the Solar system
- Planets (Types, and key information)
- Revolution (Year)
- Rotation (Day & Night) (Evidence of)
- Everywhere 15 Deg/hr, Equator moves fastest
- T.R.I.P. (Tilt, Revolution, Insolation, Parallel)
- Solstices vs. Equinox's
- Seasons (Dates, opposite hemispheres)
- Length of days (shortest, longest, equal)
- Celestial Bodies (Asteroids, Comets, Meteors)
- Constellations (why we have them, how to find)
- The moon (phases)(27 ½ days, 29 1/3 days)
- Waxing (right side) Waning (Left side)
- The sun (sunspots)
- Celestial dome image (Sun crossing sky)
- Perihelion vs Aphelion
- Star Trails, Sun movement 15deg/hr
- Why do we not have 2 eclipse's a month?
- When are we hottest, coldest
- Stars (Luminosity, Life Span)
- Tides (Spring, Neap)
- Eclipse (Lunar, Solar)
- Eccentricity (formula)(No units)
- Gravitational pull & speed
- Heliocentric Vs. Geocentric
- Local time & Time zones
- Key Latitudes (Names, degrees)
- Why is each key latitude important
- Coriolis Effect (N= Right, S= Left)
- Ages(universe,galaxy,solar system)
- Angle of Incidence (Insolation)
- incoming UV, outgoing Infrared
- Green house Effect
- Global warming (H20, C02)
- Finding height of noon day sun
- Sunrise–set (E-W,SE-SW,NE-NW)
- Orbit of Planets, and Moons
- Do the tides come to us???

Text book pages: Chapters 22, 23, 24, 25
Review book: Read chapters 3,4,6

<u>Topic 3</u>
(Earth in the Universe)
- Asteroid
- Big Bang Theory
- Celestial Object
- Comet
- Doppler Effect
- Eccentricity
- Ellipse
- Focus (foci)
- Galaxy
- Gravitation
- Impact Crater
- Impact Event
- Inertia
- Jovian Planet
- Luminosity (of a star)
- Meteor
- Milky Way Galaxy
- Moon

<u>Topic 4</u>
(Motion, Earth/Moon/Sun)
- Axis (of rotation)
- Constellation
- Coriolis Effect
- Eclipse
- Foucault Pendulum
- Geocentric Model
- Heliocentric Model
- Local Time
- Phases (of the moon)
- Tides (spring, neap)
- Time zone

<u>Topic 3 Continued</u>
Nuclear Fusion
Red Shift
Revolution
Rotation

<u>Topic 6</u>
(Insolation & Seasons)
- Angel of Incidence
- Deforestation
- El Nino
- Global Warming
- Greenhouse gases
- Heat Budget
- Ice Ages
- Insolation
- Ozone
- Sunspot
- Transpiration

Solar System
Star
Terrestrial Planet
Universe

Regents Topic Test # 3 (Heat Transfer)

- Heat Transfer (heat gain vs. heat loss)
- Convection (Definition)
- (Best in what? How it works?)
- Conduction (Definition)
- (Best in what? How it works?)
- Radiation (Definition)
- (Best in ?, Works how, Effected by)
- Specific heat (Land vs. Water)
- 3 ways our Atmosphere is heated
- Green house effect and gasses
- Types of Energy and phase changes
- States and changes of matter
- (Global winds) General Wind patterns
- (Local winds) What effects them
- Coriolis effect: Deflections Right and Left
- What causes winds (Moves how)
- * Low and High pressure systems
- How they move & weather they bring
- How L & H pressure systems track
- Atmospheric layers and gas %'s
- Ultra Violet and Infrared Radiation
- Hottest/Coldest time of year/day
- Properties of H20 and phase changes
- Isobars / Isotherms
- What effects evaporation
- Relative Humidity (& how to find)
- Dew Point (& how to find)
- Sling Psychrometer (wet/dry bulb)
- Types of Clouds (Fronts they bring)
- Types of Precipitation
- Atmospheric Transparency
- Types of Fronts
- Warm and Cold Front Weather
- How read & make a Station Models
- Barometer & recording(+/- 10 or 9)
- Wind speed and direction
- Mountain problem
- Air rises, expands and cools
- Air sinks, Compresses and warms
- Air Masses (cP, cT, mP, mT, cA)
- Wet vs. Dry Air / Hot vs. Cool Air
- Saturated vs. Unsaturated air
- Cloud Nuclei
- Anemometer & weathervane
- Pollutants

Text book pages: Chapters: - 17, 18, 19, 20 (do a quick overview of 21)
ESRT – 1, 12, 13, 14
Review book: 5, 7

Topic: 5

- Calorie
- Condensation
- Conduction
- Convection
- Crystallization
- Electromagnetic energy
- Electromagnetic Spectrum
- Energy
- Heat energy
- Mechanical Energy
- Nuclear Decay
- Radiation
- Solidification
- Specific heat
- Temperature
- Texture
- Vaporization
- Wave Length

Topic :7

- -Air Mass
- -Anemometer
- - Atm. Transparency
- - Cloud Cover
- - Cyclone
- - Dew point
- - Humidity
- - Jet Stream
- - Occluded Front
- - Polar Front
- - Probability
- - Radar
- - Stationary Front
- - Troposphere
- - Warm Front
- - Weather Variables
- -Air pressure Gradient
- -Barometric / air pressure
- - Barometer
- - Cold front
- - Cyclonic storm
- - Front
- - Isobar
- - Monsoon
- - Planetary Wind Belt
- - Precipitation
- - Psychrometer
- - Relative Humidity
- - Station Model
- - Visibility
- - Water Vapor

Regents Topic Test # 4 (Hydrological Cycle)

- Steps of the water cycle (Hydrologic cycle)
- Which is more dense and has more air pressure (wet or dry air)
- What can happen to water once it is precipitated (retention, infiltration, runoff)
- How do particles help create clouds, when do particles get removed from the air.
- Earth surface spheres, atmosphere, hydrosphere, lithosphere.
- Zones of ground water & the interface (Aeration, Saturation, Water Table)
- What is Porosity (What effects it: shape, packing, sorting) (NOT SIZE)
- *** How to find (volume of pore space / substance, % Porosity and % Substance)**
- What is Permeability (What effects it: size of pores, connectedness)
- Impermeability (tight packing, cementing, freezing of H20)
- What is Infiltration (vs. runoff)
- (Effected by: vegetation, slope, land use, rate of precip / evap, saturation)
- Capillary Action (What particle sizes work best)
- What is Evaporation, Transpiration, Evapotranspiration
- (what effects them: wind, temp, surface area, air saturation)
- *** How do you find the percent Evaporation (why is it given as a %)**
- POTENTIAL Evaporation (highest ability)
- Properties of water, heat gained/released (melt/freeze, vaporize/condense)
- Phase change graph (phases are changing where the graph is level)
- Specific heat
- Water Budgets (Income, Outgo, Excess, Shortage(deficit), source)
- Stream Discharge and Recharge.
- When do you get a flood and a drought (think water in storage)
- What is the difference between Weather and Climate
- (What effects it: latitude, wind & ocean currents, elevation, cloud cover)
- Why does proximity to a body of water affect yearly temperature range?
- Mountain problem: windward, leeward (wet cool side vs arid hot side)
- (raising air: cools by expansion, sinking air: warms by compression)

ERST: 1, 4, 6,
Text book pages: Chapters: 6 (157 – 182)

Review book: Topic # 8

- ***Topic # 8***
- Capillarity
- Climate
- Ground Water
- Hydrologic Cycle
- Infiltrate
- Permeability
- Porosity
- Prevailing Winds
- Runoff
- Seep
- Sorted
- Stream Discharge
- Unsorted
- Urbanization
- Water Cycle
- Water Retention
- Water Table

Regents Topic Test # 5 Rocks & Minerals

- Minerals
- Naturally occurring
- Inorganic Solid
- Set Chemical Composition
- Set Crystal Structure
- Compound
- Color: how it looks
  (Why least Scientific)
- Hardness: scratching
  (Mohs / field testing)
- Luster: reflecting light
  (Metallic / Non)
- Streak: powder
  (Always the same)
- Breakage: how it splits
  (Fracture / Cleavage)
- Atomic Arrangement
- Other tests (ex. Taste)

- Rocks (Mixtures)
- Igneous (Ignite/fire/melt)
- First & Most Common
- Intrusive (Underground)
- Slow cool = large crystals
- Extrusive (Above ground)
- Instant cooling (Glassy)
- Vesicular (Rock w/ bubbles)
- Finding mineral %'s pg 11
- Felsic (Al) / Mafic (Fe, Mg)
- Sedimentary (Sediment)
- Cementation / Compaction
- Most common on surface
- Best for Fossils
- Clastic (fragmental)
- Based on piece size
- Crystalline / Chemical
- (Precipitates / Evaporates)

- Bioclastic / Organic
- Metamorphic (Change)
- Heat and Pressure
- Recrystalization - harder
- Foliated (layers)
- Banding (mineral layers)
- Non Foliated
- Contact Met (Touching)
- Regional Met (ex. Mts)
- Rock Cycle (any to any)
- % element chart pg 1
- Granite – Gneiss
- Intrusions (Sill, Dike)
  (Batholith, Laccolith)

Text book pages: Chapters: 2,3

ESRT – pg. 1, 6, 7, 11,

Review book: Topic # 11

Topic 11-

Bioclastic Sedimentary Rocks
  Aka - Organic
Chemical Sedimentary Rocks
Clastic Sedimentary Rocks
Cleavage
Contact Metamorphism
Crystal Shape
Crystal Structure
Extrusive Igneous Rocks
Foliation
Fossil
Fracture
Hardness
Igneous Rock
Inorganic
Intrusive Igneous Rock
Luster
Magma
Metamorphic Rock
Metamorphism
Mineral
Mineral Crystal
Mineral Resources
Organic
Precipitation of minerals
Regional Metamorpism
Rock Cycle
Sedimentary Rocks
Streak
Texture

Regents Topics Test # 6 (Faults, Earthquakes & Volcanoes)

- Continental Drift Theory
- Wegener's proof
- What was he lacking (tides???)
- Pangaea 250 MYA
- Gondwanaland, Lurasia
- Panthalassia
- Plate Tectonics
  - Sea floor spreading (zebra banding)
  - Switching of magnetic poles
  - Earthquakes
- Plate Boundaries (earthquakes, volcanoes)
- Convection in the Mantle
- Subduction (Oceanic = more dense)
- Oceanic = basalt, continental = granite
- Divergent (rift valleys, ridges)
- Convergent (trench, mts, volcanoes)
- Transform/strike slip (faults, earthquakes)
- Stress (compression, tension, sheering)
- Folding (anticline, syncline,)
- Faulting (Lateral and Horizontal)
- Normal (footwall, tension)
- Reverse (hanging wall, compression)
- Thrust (super reverse)
- Lateral/strike-slip (fault line)
- What decides if a rock folds or faults?

- P / S / L waves (alliteration)
- Seismometer, seismograph
- Richter scale. Each # 30x's
- P/S wave arrival time (Distance)
- Triangulation (exact location)
- Focus / Epicenter
- Inferred Inner of the Earth? Why inferred
- How do Earthquakes and Volcanoes help
- What do Meteors tells us about the Earth
- Thickness of Earths Layers
- Lithosphere thickness (ocean, continent)
- Pressure, Temp, Depth, Density of interior
- State of Matter of Interior layers
- Moho zone of discontinuity
- uplift / erosion
- Evidence of uplift (fossils)
- Volcanoes (3 types) and hotspots.
- Continental Growth
- Mountain Building (Orogeny) times
- Layers originally placed down horizontal

Text book pages: Chapters: 8, 9, 10, 11

ESRT – pg. 5, 9, 10, 11

Review book: Topic # 12

- Asthenosphere
- Continental crust
- Convergent Boundary
- Crust
- Divergent Boundary
- Earthquake
- Epicenter
- Faulted
- Folded
- Hot Spot
- Inner Core
- Island Arc
- Lithosphere
- Lithospheric Plate
- Mid-Ocean Ridge
- Moho
- Oceanic Crust
- Ocean Trench
- Original Horizontality
- Outer Core
- Plate
- Plate Tectonic Theory
- P-waves
- Seismic Wave
- Subduction
- S-waves
- Tectonic Plate
- Transform Boundary
- Tsunami
- Uplifted
- Volcanic Eruption
- Volcano
- Young Mountains

Regents Topic Test # 7 (Weathering, Erosion & Deposition)

- What is Weathering
- Chemical (Water, Air, Acids)
- Physical (Temp, Biological, Abrasion, Gravity)
- How can Physical help Chemical and Vice Versa
- Product of Weathering (stages, horizons and profile of soil)
- Transported Vs Residual Soil
- Climate that weathers the most
- What is Erosion
- 5 agents of Erosion
- Wind (abrasion, sandblasting, mushroom/balancing rocks)
- Running water (stream abrasion, V-Shape Valley)
- Gravity (mass wasting, Creep, Flows, Fall)
- Glaciers (U-Shape Valley, Melt water streams)
- Waves (Abrasion, Crashing)
- What is Deposition
- Wind (Dunes, Loess)
- Running water(Delta, inside curve deposition, Levee, Ox-Bow Lake, Flood Plain)
- Gravity (Talus Slope)
- Glaciers (Kettle Lake, Moraines, Drumlins, Till, Outwash Plain)
- Waves (Beaches, Sandbars, Barrier Islands)
- Sorted Vs Unsorted Deposition
- Inside / Outside of a meander (Erosion Vs Deposition, Fast Vs. Slow)
- Potential / Kinetic Energy of Rivers
- Settling Rates
- Drainage Patterns (Topic 14 pg 313)
- Landscape Regions (Topic 14 pg 302-304)
- Longer Erosion leads to rounder smoother rocks

Text book pages: Chapters: 5,6,7

ESRT – pg. 6

Review book: Topic # 9 & 10

<u>Topic 9</u>

Abrasion
Breaking Wave
Chemical Weathering
Delta
Erosion
Finger Lake
Flood Plain
Glacial Groove
Glacial Scratches
Glacier
Mass Movement
Meander
Physical Weathering
Sandbar
Sandblasting
Sediment
Stream
Stream Abrasion
Stream Channel Shape
Tributary
U-Shaped Valley
V-Shaped Valley
Watershed
Weathering

<u>Topic 10</u>

Barrier Island
Deposition
Drumlin
Kettle Lake
Moraine
Outwash Plain
Sand Dune
Sorted Sediment
Unsorted Sediment

Regents Topic Test # 8 (Geological Time)

- Uniformitarianism
- Super position
- Original horizontality
- Inclusions
- Faults/intrusions
- Unconformities
- Disconformities
- Nonconformity
- Angular unconformity
- Relative Dating
- Index fossils
- Sequencing
- Overturned / folded
- Correlation
- Contact Metamorphism
- Volcanic Ash
- Absolute Dating
- Radio active dating
- Half life's + graph
- Carbon 14 (recent life)
- Uranium 238 (Rocks)
- Geologic Time
- Out gassing
- Mountain
- Plateau
- Plains
- Generalized Landscape of NYS
- Generalized Bedrock of NYS
- Geologic History of NYS
- Precambrian (80% of time)
- Eon, Era, Period, Epoch
- Extinctions
- Evolution
- NYS Bedrock Record
- Outcrops
- Orogeny

Text book pages: Chapters: E 1-31, 12, 13

ESRT – pg. 1 (1/2 life chart), 2 , 3 , 8 & 9

Review book: Topic # 13, 14

Topic 13:

Absolute Age
Bedrock
Carbon-14 dating
Correlation
Extrusion
Fossil
Geologic time scale
Half-Life
Inclusion
Index Fossil
Intrusion
Isotope
Organic Evolution
Outgassing
Super position
Radio active dating
Radio active decay
Species
Unconformity
Uranium-238
Volcanic Ash

Topic 14:

Escarpment
Landscape
Landscape Region
Mountain
Plain
Plateau
Ridges
Stream Drainage Pattern
Uplifting Forces

- Regents Fun Facts.
- A bit harder to read but here if you want to try.

Regents Earth Science

Fun Facts From Earth Science

(Have fun memorizing them!)

Map Facts:

TGIF / top goes in first
Rivers and streams always move/ from high to low elevations
Close Isolines / steep gradient...steep hill...strong winds
Contour Lines Always Bend / the opposite way the water is moving
The Altitude of Polaris / is equal to your latitude (in the N. Hemisphere)
Most Environmental Changes / are cyclic

Rock Facts:

Hydrosphere / water part of the Earth...Lithosphere / rock part of the Earth
All Sedimentary Rocks form in places where / water was present
Metamorphic Rocks / more dense...banded...deformed...associated with mountains
All Minerals are the way they are due to / internal arrangement of the atoms
Sedimentary Rocks contain / fossils...layers...sediments...mud cracks...ripple mark
Metamorphic Rocks / banded...dense...deformed...found in mountains
Fast Cooling / small or no crystals Slow Cooling / big crystals
Any Rock with the Mineral Calcite / bubbles with acid

Plate Tectonic Facts:

P-waves / faster...travel through solids and liquids S-waves /slower...travel through solids only
Ocean Crust / basalt...more dense...younger...thinner
Continental Crust /granite...less dense...older...thicker
Convection Currents / heat transfer due to density differences...move plates...occurs at mid ocean ridges
Most Crustal Activity Occurs at / plate boundaries & hot spots
Evidence of Crustal Movement / marine fossils on mountain tops...deformed or tilted layers...layers do not line up
Outer Core Inferred to be liquid because / S waves cannot pass through
Evidence of Continental Drift / matching rocks & fossils...puzzle fit...glacial deposits...tropical plant fossils...coal deposits
Mid Ocean Ridges / same on both sides with age & magnetism...youngest closest to ridge

Weathering Facts:

Erosion / move Weathering /wear away Deposition / drop
Faster Water / steeper slope...more water (discharge), straighter channel
Capillarity / water moves up through soil...faster if particles are small
Outside of Curve / faster...deeper...more erosion...less deposition
Inside of Curve / slower...shallow...less erosion...more deposition
Harder Rocks Weather / slower...more resistant Softer Rocks Weather / faster...less resistant
Abrasion / scratches in rock
Rivvvvvvers Carve / V-shaped valleys
Glacial Landscape / scratched bedrock...isolated boulders...U-shaped valleys...unsorted sediments...moraines
Effects of Water / smooth...rounded &sorted horizontally and vertically
Largest...Most Dense & Round /settle first Smallest...Less...Dense...Flat / settle slower
Permeability / water moves down through the soil (infiltration)...faster if particles are big, ground is not frozen
Capillarity / water moves up through the soil...faster if the particles are small
Porosity / space between particles...size does not affect it (if particles are the same size and shape
Runoff is Most If / too much water...ground is impermeable (packed or paved)...steep slope
Sediments Don't Match Bedrock / transported sediment
Chemical Weathering / warm & wet Physical Weathering / cold & dry
Mass Movement / a lot of stuff moves down a slope all at one time
Shape of Landscape Regions are determined by / underlying bedrock

Geologic History:

Every Half-life/half (50%)of the radioactive substance will decay and more non- radioactive stuff forms
Anything that happens to a rock / must be more recent than the age of the rock
If you see Contact Metamorphosis / the rock is older than the intrusion
Precambrian / represents 90% of geologic time
Carbon 14 / used to date recent fossils only...less than 50,000 years (it has a short half life)
If you see Contact Metamorphosis / the rock with the contact metamorphosis must be older
Every Half-Life / half of the radioactive substance decays & more non radioactive stuff forms
Unconformity / loss of geologic record...buried erosional surface caused by erosion and more deposition
Index Fossil / lived for a short period of time & found in many places worldwide
Precambrian represents / 90% of the history of Earth
Correlation / matching rock's ages in areas far away from each other
Correlation Methods / index fossil & volcanic ash

Meteorology:
The closer the Dew Point and the Air Temp / the wetter the air...more relative humidity...more chance of rain
Everything on Earth moves from regions of where there is more / to regions where there is less (examples: pressure & Temp)
Dew Point Temperature / condensation occurs forming clouds, air is saturated
Saturated / full can't hold any more (refers to ground or air)
Strongest Winds / biggest difference in pressure...pressure gradient
Hurricanes / late summer early fall, form over warm tropical waters...form in South Atlantic...bigger...more destructive
Tornado / late spring early summer...smaller...short lived
Weather Moves From West to east with a curve to the northeast
Evaporation Rate depends on / wind...temp...humidity...surface area
Cold Front / brief heavy rain as the front arrives and passes followed by cooler temps
Warm Front / long light rain as the front arrives and passes followed by warmer temps
Air masses get the Characteristics of / where they come from
Conduction / solids Convection / liquid or gas Radiation / no molecules
The Closer the Air Temp and the Dew Point / the wetter the air...higher chance of rain...higher relative humidity
Air always moves from / high pressure towards low pressure causing winds
The Bigger the Difference in Pressure / the stronger the wind (pressure gradient)
Station Model Air Pressure / put a 10 & a 9 in front and check the reference tables
High Pressure / cool & dry...clockwise...away from the center
Low Pressure / warm & wet...counterclockwise... towards the center (sucks)
All weather systems move / from west to east curving to the Northeast
Decrease in Temperature / Increase in relative humidity
Barometer / Air Pressure Anemometer / wind speed Sling Psychrometer /humidity or Dew Point
Condensation Nuclei / dust particles necessary for water to collect on forming raindrops
Evaporation Rate Depends On / humidity...wind...temperature...surface area
Evapotranspiration / loss of water into the atmosphere through evaporation & plants

Climate:
Windward Side / near water...cool & humid Leeward Side...away from water hot & dry
Ocean Currents / wind blows across them making the land warmer or cooler
Type of Electromagnetic Energy / determined by the wavelength
Dark & Rough / absorbs Light & Smooth / reflects
Global Warming is caused by / Carbon Dioxide...Water Vapor...Methane absorb Infrared (heat)
Carbon Dioxide is Produced / by burning fossil fuels
All Types of Electromagnetic Energy is determined by / wavelength
Water Always Heats / slower...higher specific heat
Air Rises / expands & cools Air Sinks / compresses & warms
Specific Heat / lower number indicates it heats quickly - water heats slowly
Marine Climate / cooler summers & warmer winters Continental Climate / warmer summers & cooler winters

Astronomy:
Earth Rotation / counterclockwise spin in place...15 per hour...360 per day causes day & night...objects move across sky each day & night
Earth Revolution / counterclockwise around Sun...1 per day...360 in 365 days...causes seasons...constellations to shift
When the Moon & Sun are on opposite sides of Earth / full moon
When the Sun & Moon are on the same side of Earth / new moon
Solar Eclipse / sun is blocked by moon Lunar Eclipse / moon is blocked by Earth
June 21 /summer solstice..longest day...maximum altitude of sun...sunrise N of east..sunset N of west..vertical ray Tropic of Cancer
December 21/ winter solstice...shortest day;..minimum altitude of the sun...sunrise S of east...sunset S of west...vertical ray Tropic of Capricorn
March 21 & Sept 23 / equinox...12 hour day...sunrise due E...sunset due W...vertical ray Equator EQ...EQ...EQ
Foucalt Pendulum / proves rotation...disproves geocentric model
Coriolis Effect / proves rotation,...objects (winds) appear to shift to the right in the N. hemisphere...disprove geocentric model
Red Shift / expanding universe
Longest Shadows Occur When / the sun has the lowest altitude
The greater the Altitude of the Sun / the greater the intensity of insolation
Earth's Tilt Causes / Seasons Less Tilt / less difference in seasonal temperatures
North Pole Summer Hours of Daylight / 24
The Equator Always has / 12 hours of daylight
When the Northern Part of the Earth's Axis Tilts Away From the Sun / winter
Our Galaxy is / Milky Way...spiral shaped...cluster of billions of stars
Size Order / Universe...Galaxy...Solar System...Planet
Geocentric Model / Earth is in the center does not rotate or revolve (G before H)
Heliocentric Model / Sun is in the center rotates and revolves (G before H)
Time of Day Changes / 15 per hour on Earth West is always / earlier same longitude /same time
Jovian Planets / outer 4. Terrestrial Planets / Inner 4
Gravitation Attraction is Greatest When / distance is small or mass is big
To see the Sun above 23½ degrees latitude / you must look south
Apparent Diameter / objects look bigger when they are closer
Spring Tides / Moon, Earth & Sun in straight line...higher high tides & lower low tides
Neap Tides / Moon, Earth & Sun at Right angles... less extreme high & low tides
Stars or Sun / a burning ball of gas producing energy by nuclear fusion