

Final Exam Study Guide- 2014

The Universe

1. **Cosmology is the study of what aspect of astronomy?**
Cosmology is the study of how the universe is arranged.
2. **List the two most abundant gases in the universe and explain why we have so much of them.**
Hydrogen and Helium – small, simple atoms
3. **What was the Big Bang and why is it important to cosmology?**
All matter and energy were at one time compressed into a very small space. The compressed matter exploded outward releasing all of the matter and energy that makes up the expanding universe.

Life Cycle of Stars

4. **What forces are responsible for creating stars?**
Gravity and friction
5. **What is a young star called and what causes these young stars to heat up and glow?**
 - a. Begins as a protostar and as matter stops accreting it becomes a pre-main sequence star
 - b. Light and heat is generated in a protostar by Friction
 - c. Light and heat is generated in a pre-main sequence star by Fusion
6. **What physically happens to a star as it moves through the main sequence?**
It expands and contracts
7. **What is the most influential factor in the life and death of a star? Why?**
Mass - it determines what the star will become later in its life cycle.
8. **What features can form when a star dies and what are these figures based on?**
 - As stars grow older they usually grow larger.
 - Fusion continues until the stars' gravity can't re-start fusion or until it makes Iron
 - After fusion ends gravity pulls the star inward which creates different objects depending on the mass of the star.
 - Black Dwarf (low mass star)
 - Neutron Star (High mass star)
 - Black Hole (Very High mass star)

Hertzsprung-Russell Diagram

9. What can an H-R diagram tell you about a star?

- The age of the star and the surface temperature of the star
- How far through the star's life cycle it is and the surface temperature of the star
- The age of the star and how far through the star's life cycle it is

10. What is the difference between apparent magnitude and absolute magnitude? When is one more useful than the other?

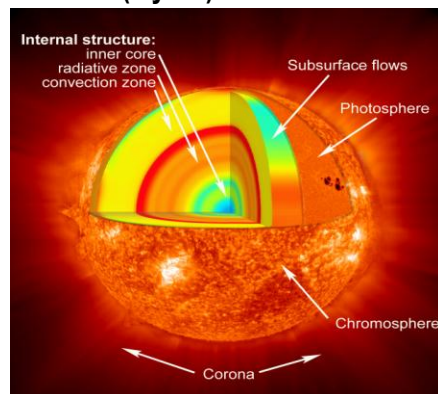
Absolute Magnitude: The brightness of a star as though all stars are the same distance from Earth

Apparent Magnitude: The brightness of a star as seen from Earth; *hotter the star, the more light it gives off

The Sun

11. Describe the interior of the Sun. (layers)

Radiative Core
Convective Zone
Photosphere
Solar Corona



12. Explain how granules allow energy to be released from the Sun.

Hydrogen gas rises and falls in individual pockets which is known as convection

13. What kind of star is the Sun? What does this mean about the Sun's location in its life cycle?

Main Sequence – about halfway through its cycle

14. What type of fusion is going on inside a main sequence star?

Hydrogen to Helium

15. What is nuclear fusion? How is it different from nuclear fission?

Fusion: Two smaller atoms coming together to form a larger atom (fuse together)

Fission: Large atom breaks apart into smaller atoms

Solar System

Review your planet information!

16. Which planet is the largest? Smallest?

Largest: **Jupiter**

Smallest: **Mercury**

17. Which planets have ring systems?

Jupiter, Saturn, Uranus, Neptune (the gas giants)

18. Which planets have atmospheres?

Venus: (thick, made carbon dioxide)

Earth: (Nitrogen & Oxygen)

Mars: (Extremely thin, made of carbon dioxide)

Jupiter, Saturn, Uranus, Neptune: (extremely thick atmospheres made of methane, ammonia, hydrogen, helium)

19. What are the Great Red Spot and Great Dark Spot? On which planets are they found?

Which planet is the hottest? coldest? What makes these planets hot or cold?

Great Red Spot: **Jupiter's cyclonic storm**

Great Dark Spot: **Neptune's cyclonic storm**

Hottest Planet: **Venus due to the atmosphere of carbon dioxide that traps in heat**

Coldest: **Neptune – furthest from the sun and wind speeds**

20. What objects are included in our solar system?

Planets, sun, meteoroids, comets, asteroids, etc.

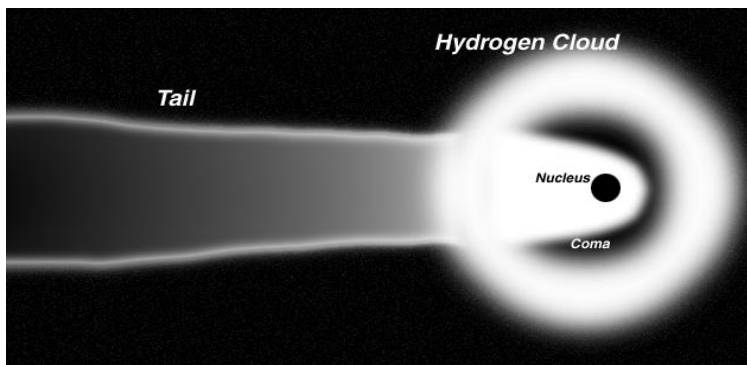
21. What is the asteroid belt? Where is it located?

Area of space between Mars and Jupiter filled with rocky debris

22. What is a comet made of? Draw and name the 3 parts of a comet.

The Nucleus is made of: Minerals, Metals and Ice

The coma and the tail are gases and vapors escaping from the nucleus due to the heat of the Sun.



Telescopes

23. Describe a: meteor, meteoroid, meteorite? What is the difference amongst these?

| Meteor | Meteoroid | Meteorite |
|---|--|---|
| <ul style="list-style-type: none"> ■ The light created as a meteoroid <u>passes through a planets' atmosphere.</u> ■ Also called "Shooting Stars." ■ 5-15 can be seen nightly. ■ ~ 100 million enter the Earth's atmosphere daily ■ Add several tons to the Earth every day ■ When many enter at once it is called a meteor shower. (generally from a comets' tail) | <ul style="list-style-type: none"> ■ Rocky fragment <u>floating through space</u> ■ Large as a boulder or small as a grain of sand ■ Has no orbit | <ul style="list-style-type: none"> ■ Meteor that <u>strikes a planet's surface</u> ■ Made of stone or iron or a mixture of both (weigh several ounces to 35 tons) ■ Most are found in Antarctica |

24. What is the difference between a meteoroid and a comet?

A comet has an orbit; A meteoroid does not...it just floats through space

25. What are the two types of optical telescopes? What is the difference in how they collect light?

See chart below

26. Which of the two types of optical telescopes gives a better image? Why?

See chart below

27. Name the other types of telescopes and what they detect.

See chart below

| Name: | Refracting | Reflecting | <u>Radio</u> | Infrared |
|--------------------------------|-------------------|---|------------------|------------|
| Type: | Optical telescope | Optical Telescope | XXXXXXXXXX | XXXXXXXXXX |
| What does it use to work? | lenses | mirrors | Satellite dishes | |
| What do they collect / detect? | Visible light | Visible light | Radio Waves | Heat |
| | | Better image b/c light doesn't pass through glass | | |

Eclipses

28. Describe the two types of eclipses.

Lunar: the Moon is passing into Earth's Umbra which causes the sun to be blocked out by the Moon and the earth's shadow to appear on the Moon.

Solar: When the moon gets between Earth and the sun, and the moon casts a shadow over Earth.

29. What is the difference between the umbra and penumbra?

Umbra: Part of an eclipse; an area where light is completely blocked; Full Shadow

Penumbra: Part of an eclipse; an area where only part of the light is blocked; Partial Shadow

Geology

30. What is the shape of the Earth? How do we know this?

Oblate Spheroid

1. The North Star moved in an arc in the sky as sailors sailed north or south. (higher in the sky as they sailed north and lower in the sky as they sailed south)
2. The mast of a ship is the first thing you see over the horizon as it sails toward you and the last as it sails away

31. List and describe the four types of geologic events.

Tectonic: caused by an earthquake

Gradational: caused by a change in grade (Slope)

Volcanic: caused by a volcanic eruption

Impact: caused by an object colliding with the Earth

32. How do the Laws of Superposition and Cross-Cutting Relationships help determine the age of a rock?

Law of Superposition: In any undisturbed sequence of rocks the oldest are on the bottom

Cross-Cutting Relationships: Any object cutting through a rock layer is younger than the rock layer itself

Minerals

33. List the five criteria that must be met for a substance to be considered a mineral.

Naturally Occurring

Definite Chemical Composition

Definite Crystal Structure

Solid

Inorganic

34. Compare and contrast the types of minerals.

| Silicates | Carbonates | Iron Oxides & Iron Sulfides |
|---|--|--------------------------------------|
| 90% of all minerals belong to this group | CO ₃ bonded to a metal (common around here) | Iron combined with oxygen and sulfur |
| Silicon + a metal (Al, Fe, etc.) | Generally react to acids (creating rocks that are easily dissolved by acid rain making caves and sink holes) | Very heavy, dense minerals |
| Atoms form a silica tetrahedron | | Resemble a piece of metal |
| The silica tetrahedron causes the minerals to have their distinct crystal shapes. | | |
| Feldspars – most common type of silicate found in the Earth's crust (Al has replaced some of the Si in the tetrahedron) | | |

35. List the other mineral identification properties and explain how they are used to aid in identifying minerals.

Color: least useful identification property

Luster: The way a mineral reflects light (vitreous [glassy], pearly, metallic, non-metallic [earthy])

Crystal Shape: atoms forming distinct crystal patterns

Hardness: The resistance of a mineral to being scratched

- Uses the Mohs Hardness Scale
- Mohs Scale ranks minerals from 1 – 10 (1 is softest and 10 is the hardest)
- Talc = 1 and Diamond = 10 (not always whole numbers)

Streak: The color of a mineral's powder

- To obtain the mineral's powder you rub the mineral across a Streak Plate (porcelain)
- Mineral color and the mineral streak are not necessarily the same. (All minerals do not have a streak – some are too hard)

Cleavage and Fracture: The way in which a mineral breaks or splits

- Cleavage = smooth break on a flat surface
- Fracture = rough break with jagged edges

Specific Gravity: Ratio of the mass of a mineral compared to the mass of an equal volume of water

Rocks

36. What is a rock?

A group of minerals bound together in some way

- How they are bound determines the type of rock that you get.

37. List the three types of rocks. How do these three rock types form?

Igneous:

- Made from molten (melted) rock
- Rocks that are created as magma cools and hardens.

Metamorphic:

- Rocks that are created by changes in the rock brought about by heat, pressure or chemical reactions.

Sedimentary:

- Rocks made from pieces of other rock that have become cemented together.

38. What is the difference between a mafic and felsic rock? (both physically and chemically)

Felsic: contains more than 50% silicate material (generally light colored rocks)

Mafic: contains over 50% iron and magnesium (generally dark colored rocks)

39. What is the difference in texture between an intrusive and an extrusive igneous rock? How does where the rock cooled effect the texture of the rock? Why?

| | Intrusive | Extrusive |
|--------------|----------------|-----------------------|
| Cooling | Underground | Above ground |
| Cooling Time | Slowly | Quickly |
| Grain Size | Large crystals | Small crystals |
| Texture | Coarse grained | Fine grained / glassy |

- **Porphyritic:** both intrusive and extrusive b/c it has both large and small crystals

40. How do the three types of sedimentary rocks form?

Clastic

- Made by other rocks being eroded into sediments.
- The sediments are then deposited and compacted.
- Cement then works its way between the sediment particles and creates a rock.
- Clastic rocks are described by their sorting.
- Well sorted means all pieces of the rock are similar in size, poorly sorted means that the pieces that make up the rock are different sizes.

Chemical

- Made as mineral rich water evaporates and the minerals are left behind.

Organic

- A rock made from the remains of a dead plant or animal.
- Coal (plants) and organic limestone (animal) are two examples of organic rocks.

41. What are the different features that can be found in sedimentary rocks?

Stratification

- Made as different types of sediment are layered on top of one another.
- The different rock types create layers in the rocks.
- It is only found in clastic sedimentary rocks

Fossils

- Made from the imprint of the hard parts of plants or animals.
- They are only found in clastic sedimentary rocks.

Ripple Marks and Mud Cracks

- Can show what the climate of an area was like during the time of the rock's creation.
- **Ripple Marks** are found in rocks that form near water.
- **Mud Cracks** form in rocks from very dry, arid regions (deserts)

Geodes

- Forms when a rock is hollowed by mineral-rich water and then the water evaporates.
- As the water evaporates it leaves the minerals behind in the form of mineral crystals within the rock.
- Eventually the rocks can completely fill with mineral crystals.

42. What forms metamorphic rocks?

Heat, pressure or chemical reactions

43. What is foliation?

Layers within a rock created by pressure

44. What is the difference between regional and contact metamorphism?

| | Contact Metamorphism | Regional Metamorphism |
|------------------|--|-----------------------|
| Process | Lava or magma "bakes" a rock - heating | Pressure crushes rock |
| Size of area | smaller | larger |
| Changes in rocks | crystals | Layers created |
| Texture | Non-foliated | foliated |

45. Describe the rock cycle and how it can determine how different rock types are made.

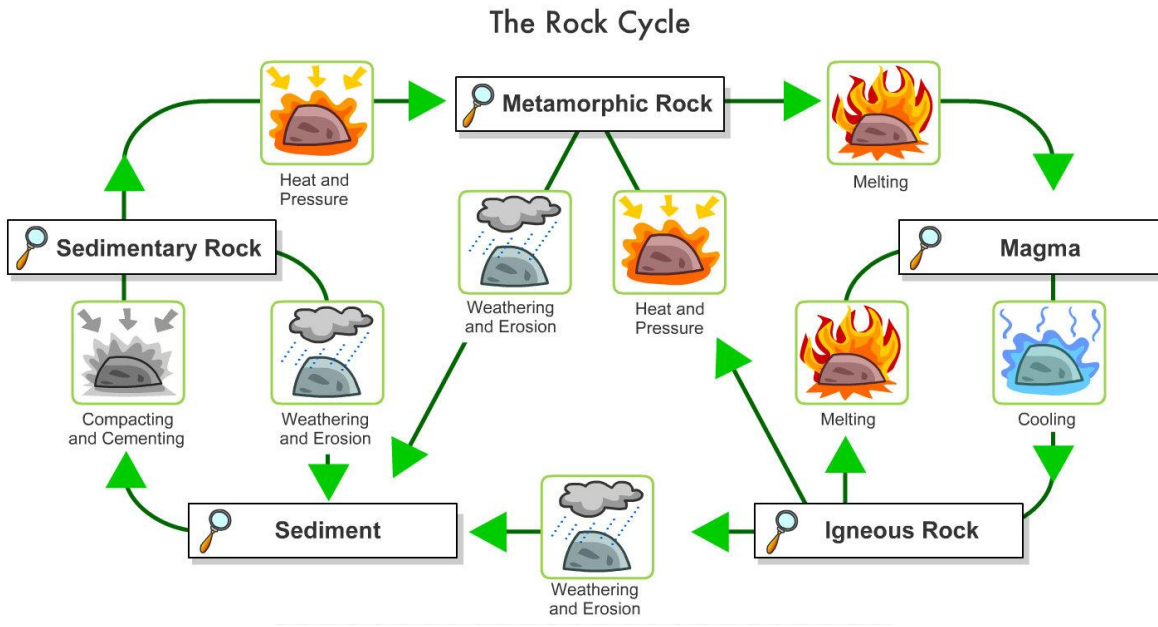


Plate Tectonics

46. Compare and Contrast Uniformitarianism to Catastrophism.

Catastrophism:

- The Earth's surface was created by fast drastic changes (called catastrophes) that occurred long ago and do not occur anymore

Uniformitarianism

- Developed by the father of modern Geology, James Hutton
- Hutton said that the forces that made the Earth look the way it does are the still occurring today.
- "The present is the key to the past"

47. What is plate tectonics and how does it explain the formation of the Earth's surface?

The theory of the formation and movement of the plates that cover the Earth's surface.

48. What is the difference between the lithosphere and asthenosphere?

The lithosphere is the top, most solid layer of the mantle. It is often included in the crust.

The asthenosphere is the second and more plastic layer of the mantle.

49. What was Alfred Wegener's contribution to plate tectonics?

Alfred Wegener came up with the theory of continental drift. He theorized that the Earth's continents were once all together as a supercontinent called Pangaea. He believed the supercontinent split into two smaller continents called Laurasia and Gondwanaland. He said that these continents continued to move and split until we have the continents we know today. His evidence was that the continents seem to fit together like a jigsaw puzzle. He said that the continents had to once be together because he noticed that certain areas on earth that are now deserts had evidence of glaciers and coal and certain fossils were found on opposite sides of the ocean.

50. What are the three types of plate boundaries? What occurs at these boundaries?

Divergent: Two plates are moving away from each other. Creates volcanoes

Convergent: Two plates are moving toward each other. 3 types depending on crust type (see next ?)

Transform: Two plates slide past each other

51. What features can form at convergent plate boundaries?

continental – oceanic: volcanoes are formed

oceanic – oceanic: islands are formed

continental – continental: mountains are formed

52. What is seafloor spreading?



Harry Hess's theory that the seafloor moves like a conveyor belt. The plates move apart at ridges and together at trenches.

53. How did Harry Hess' seafloor spreading help to support continental drift?

See answer in question 52

Volcanoes

54. List the three volcano types.

See chart in question 55

55. Describe the eruptions and shape of each type of volcano.

| | Shield Volcano | Cinder Cone | Composite Cone |
|---|---------------------------|---|---|
| Size of volcano | Largest | smallest | Medium |
| Describe the sides of the volcano | Very gently sloping sides | Very steeply sloping sides | Sloping gently at base, steeper at peak |
| Type of eruption | Most gentle (non-violent) | Medium strength...typically runny and full of gases | Alternate between gentle and very violent |
| Type of Boundary the volcano is formed at | divergent | XXXXXXXXXX | convergent |

56. What is a crater? caldera? vent?

Crater: normal, relatively small depression at the volcano's peak

Caldera: a very large crater that forms from erosion or explosion

Vent: areas where lava or debris escapes from the volcano

57. What is tephra? Describe the various types of tephra.

Tephra: any debris that comes from a volcano

Lapilli: pebbles, no more than several centimeters in diameter

Bombs: football sized pieces of rock that travel very fast

Ash: The most damaging form of tephra b/c of its weight as it builds

58. List and describe the three states of volcano activity.

Extinct: this volcano has been eroded

Active: this volcano has erupted in recent history

Dormant: this volcano has erupted in the past several thousand years

59. Name some benefits of volcanic activity.

Volcanoes provide fertile soil. The volcano's activity adds nutrients and minerals to the soil.

Volcanoes provide geothermal energy. Iceland generates a vast majority of their energy using heat from volcanoes to produce electricity. It is extremely cheap for the residents!

Earthquakes

60. What is an earthquake?

Shaking of the Earth's crust due to the release of built up energy from two plates grinding against one another.

61. What is the elastic rebound theory?

Theory states that two (2) plates will snap past one another retaining their shape, but ending in a new position, after the plate can no longer store energy

62. What is a fault? epicenter? focus?

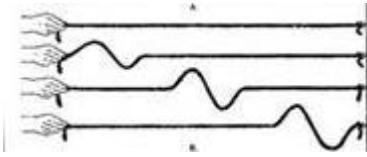
Fault: Crack in the Earth's surface where two plates meet and slide past one another. (transform boundary)

Focus: location beneath the crust along a fault where the energy between the plates was stored.

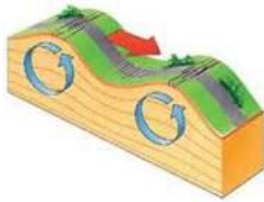
Epicenter: location on the surface directly above the focus.

63. List the three types of seismic waves and describe the characteristics and movements of each.

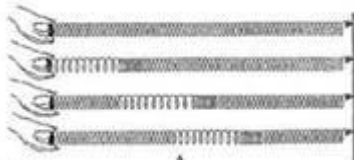
1. **Secondary Waves (S):** The second fastest wave that moves through solids



2. **Surface (L) Waves:** These waves are the slowest, but move the ground the most and cause the most damage



3. **Primary (P) Waves:** These are the fastest waves, but cause the least amount of damage.



64. What are the scales used to measure an earthquake's strength. What does each measure?

Richter Scale: ranges from 1-10 and measure the energy given off by an earthquake.

Mercalli Scale: ranges from 1-12 and measure the amount of damage caused by an earthquake.

65. List some earthquake hazards.

Ground Shaking

Foundation Failure (buildings collapse)

Fires (1906 – San Francisco → 80% of the city burned down)

Landslides

Tsunami: huge waves caused, generally, by underwater earthquakes

Soils

66. Define soil.

Soil is a naturally occurring body of thick layers comprised of minerals and organic (dead & decaying) material that differs from parent material physically, biologically, and morphologically.

67. List the five soil forming factors?

Organics: vegetation and animals (both decaying and root action)

Time: how long it has been there (age)

Climate: the amount of rain and other biological factors

Slope: amount of water runoff

Parent Material: type of rock the soil is made of

68. What is the difference between weathering and erosion?

Weathering is the process of breaking down rock.

Erosion is the breaking down AND transport of those rocks.

69. What are the two types of weathering?

| Types of Weathering → | Mechanical (Physical Breakdown) | Chemical |
|--|--|--------------|
| Things associated with that type of weathering | 1. Frost action 2. Shrink/Swell 3. Root Action | 1. Acid Rain |

70. What can cause erosion?

Wind, Water, Ice (Glaciers)

71. What are the 2 types of parent material?

1. Residual Parent Material

Definition: Parent Material made from the remains of a rock that was weathered

2. Transported Parent Material

Definition: Parent Material that is moved from one location to another

72. How can transported parent material be created?

Types of Transported Parent Material:

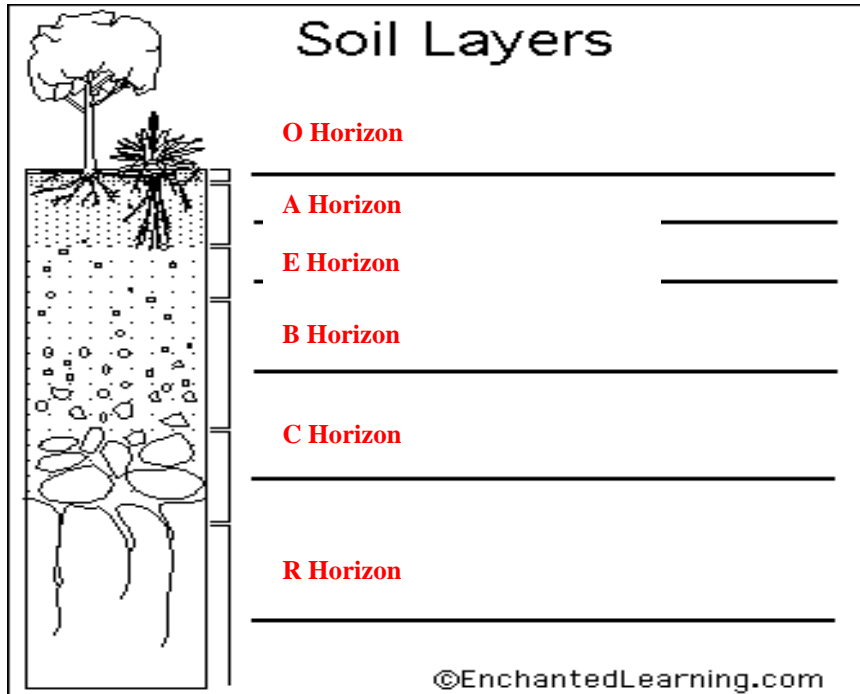
Eolian: moved by wind; found in deserts

Fluvial: moved by streams or floods

Colluvium: moved by gravity (mountains)

Glacial: moved by glacier or glacial outwash

73. Sketch the soil master horizons and describe each.



C Horizon _____ - Also called regolith. It consists of slightly broken-up bedrock. Plant roots do not penetrate into this layer; very little organic material is found in this layer. (In notes: Mr. Sheerer used weathered rock instead of regolith)

E Horizon _____ - This eluviation (leaching) layer is light in color; It is made up mostly of sand and silt, having lost most of its minerals and clay as water drips through the soil (in the process of eluviation). (In notes: Mr. Sheerer called eluviation the sandy layer)

B Horizon _____ - Also called the subsoil. It contains clay and mineral deposits (like iron, aluminum oxides, and calcium carbonate) that it receives from layers above it when mineralized water drips from the soil above. (In notes: Mr. Sheerer used silt and clay instead of subsoil)

R Horizon _____ - The unweathered rock (bedrock) layer that is beneath all the other layers.

O Horizon _____ - The top, organic layer of soil, made up mostly of leaf litter and humus (decomposed organic matter).

A Horizon _____ - The layer called topsoil; Seeds germinate and plant roots grow in this dark-colored layer. It is made up of humus (decomposed organic matter) mixed with mineral particles.

74. What is the difference between the coarse fraction and the soil separates? What is the importance of each?

Coarse Fraction

| | |
|-----------------------------|--------------------|
| _____ Cobbles _____ | 75mm – 200mm |
| _____ Boulders _____ | greater than 600mm |
| _____ Gravels _____ | 2mm - 75mm |
| _____ Stones _____ | 250mm – 600mm |

Soil Separates

| | |
|-------------------------|-----------|
| _____ Clay _____ | smallest |
| _____ Silt _____ | mid-sized |
| _____ Sand _____ | largest |

- **Note: Clay is the most important grain size because it holds nutrients for plants**

Oceanography – SKIP THIS SECTION

75. What is a salt?

76. What is salinity?

77. What are the three temperature zones in the ocean? Describe each.

78. List the different types of tides and describe each.

79. How can density currents be created?

80. List the three types of currents and describe their temperature and direction of flow.

81. What is the shoreline? continental margin? continental shelf? continental slope? continental rise?

82. What are submarine canyons? Abyssal plains? Seamounts? Guyots? Trenches? midocean ridges?

Waves – SKIP THIS SECTION

83. What is the motion of water particles inside ocean waves?

84. What two ways can waves form?

85. What are the parts of a wave? (making a diagram would help)

86. What is a breaker? How and why do they form?

87. What is a tsunami? How is it different from a wind created wave?

Meteorology

88. What are the three major components of our **atmosphere** (should be weather)?

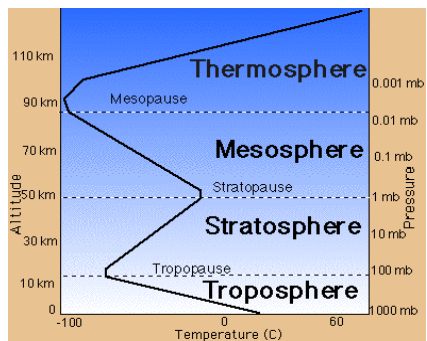
Humidity

Temperature

Air Pressure

* See Definitions in Question 91

89. What are the 4 main layers of our atmosphere?



90. List the two types of barometers and describe each.

Mercury Barometer: uses the element Mercury to measure air pressure

Aneroid Barometer: uses a vacuum can to determine air pressure

91. Define: air pressure, humidity, relative humidity and temperature
Humidity: **the amount of moisture (water vapor) in the atmosphere**
Relative Humidity: **The amount of water in the air compared to the maximum amount of water the air can hold**
Temperature: **the amount of heat in the atmosphere**
Air Pressure: **the weight of the atmosphere at a particular place at a particular time**

92. What does a psychrometer measure? a hygrometer? Describe how each works.
Psychrometer: **Instrument that measures the humidity using evaporation of water and the air temperature**
Hygrometer: **Instrument that measures relative humidity using the “frizziness” of hair**

93. List the different air masses, describe where they form, their humidity and temperature.
Air Mass: **large body of air with the same temperature and humidity**

Types:

Maritime Polar (mP) – **cold, humid air mass**
Maritime Tropical (mT) – **warm, humid air mass**
Continental Polar (cP) – **cold, dry air mass**
Continental Tropical (cT) – **warm, dry air mass**

94. Be able to convert °C to °F, °F to °C, °C to °K, °K to °C, °K to °F and °F to °K.

$$^{\circ}\text{C} \rightarrow ^{\circ}\text{F} = 9/5 (^{\circ}\text{C} + 32)$$

$$^{\circ}\text{F} \rightarrow ^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$$

$$^{\circ}\text{C} \rightarrow ^{\circ}\text{K} = ^{\circ}\text{C} + 273$$

95. What is adiabatic cooling?

As air rises it expands and cools and eventually reaches the Dew Point Temperature (no energy is added or removed from the system)

96. List the ways that a cloud can form and explain each.

Need:

- a. **Moisture**
- b. **Condensation Nuclei – particle for water to condense onto**

1. **Temperature Change: when a warmer body of air mixes with a cooler body of air causing it to drop below the Dew Point Temperature**

- Dew Point temperature is the temperature at which air is at 100% relative humidity

2. **Advective Cooling**

- **When a warm body of air moves across a cooler surface causing it to cool to the Dew Point Temperature.**

3. **Adiabatic Cooling**

- as air rises it expands and cools and eventually reaches the Dew Point Temperature (no energy is added or removed from the system)

97. What are the three main types of clouds and what are their altitudes?

Stratus

- Lowest altitude
- Means “sheet-like” or “layered”
- Usually very little precipitation from these clouds

Cumulus

- Medium altitude
- Means “piled” or “heaped”
- Called “Fair Weather Clouds”
- May form into Cumulonimbus Clouds (thunderstorm clouds)

Cirrus

- Highest Altitude
- Means “wispy” or “feathery”
- Made from ice crystals

98. What is the Greenhouse Effect? Is it a bad thing?

NOT always a bad thing

Shortwave energy enters the atmosphere and is converted to long wave energy

Longwave energy is then trapped at the Earth’s surface

99. List the four fronts and the weather associated with each.

Fronts: leading edge of an air mass

Cold Front – thunderstorms (summer) / snow (winter)

Warm Front – rain (summer) / snow (winter)

Stationary Front – extended periods of rain or snow

Occluded Front – extended periods of rain or snow (not as long as stationary fronts)

100. Explain how the types of precipitation form.

Definition – anything that is created in and falls from the base of a cloud

Types:

- Rain – liquid when it leaves the cloud and a liquid when it hits the ground
- Snow – solid when it leaves the cloud and a solid when it hits the ground
- Sleet – liquid when it leaves the cloud and a solid when it hits the ground (frozen raindrops)
- Hail – made only during thunderstorms (cumulonimbus clouds)
- Freezing Rain – liquid when it leaves the cloud and becomes a solid immediately upon touching the ground (super-cooled water)

101. List the types of clouds and their altitudes. Why are some clouds more vertically developed than others?
See question #97

102. Explain what a tornado is and some hazards.

Characteristics of a Tornado

- Most destructive of all atmospheric disturbances
- Average 400m in diameter
- Up to a 100 mb pressure change from outside to the center of the tornado
- Wind speeds between 100 and 300 mph
- Move at 35-75 mph along the surface
- Last anywhere from 10 minutes to 8 hours

Hazards

- Extremely high wind speeds
- Strong Updraft (100 mph)
- Multiple Vortices (most dangerous)
- Abrupt drop in air pressure

103. What is the difference between a watch and a warning?

Watch

- Conditions are good for the formation of severe weather

Warning

- severe weather is occurring and could take place near you

104. Explain how a tropical cyclone forms and some hazards associated with it. (three stages)

A tropical cyclone is a storm system characterized by a large low-pressure centre and numerous thunderstorms that produce strong winds and heavy rain. It undergoes 3 or 4 stages which are the formation stage, deepening stage, mature stage and the decay stage. These stages occur in a continuous process and they may even occur more than once during the life-cycle of a particular storm.

Hazards

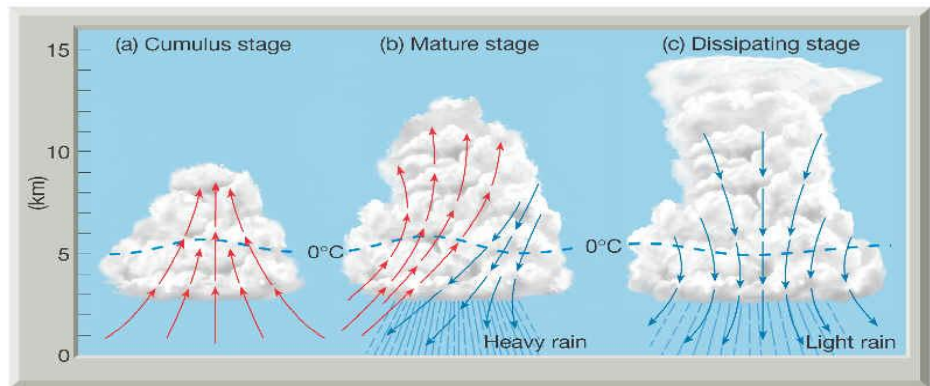
- Heavy rain (flooding)
- Storm Surge – large dome of seawater pushed onshore by the hurricane
- Strong Winds
- Possible Tornadoes

105. Describe the 3 stages of thunderstorm development. (sketches may help)

Definition: **Small, short-lived storm system caused by the uplift of warm, moist air**

Stages:

- Cumulus
- Mature
- Dissipation



106. Explain how hail forms in a cumulonimbus cloud.

Hail forms in strong thunderstorm clouds, particularly those with intense updrafts, high liquid water content, great vertical extent, large water droplets, and where a good portion of the cloud layer is below freezing 0 °C (32 °F)

It forms by very cold water droplets in a cloud collide with condensation. When the hail stone becomes too big to be held by gravity, it falls from the cloud.

107. Explain how lightning is created in a cumulonimbus cloud.

Lightning is caused by ionized droplets in the clouds rubbing against each other. The static charge built up creates lightning.

***** Also: Be able to place isobars and fronts on a weather map and create a weather forecast!**