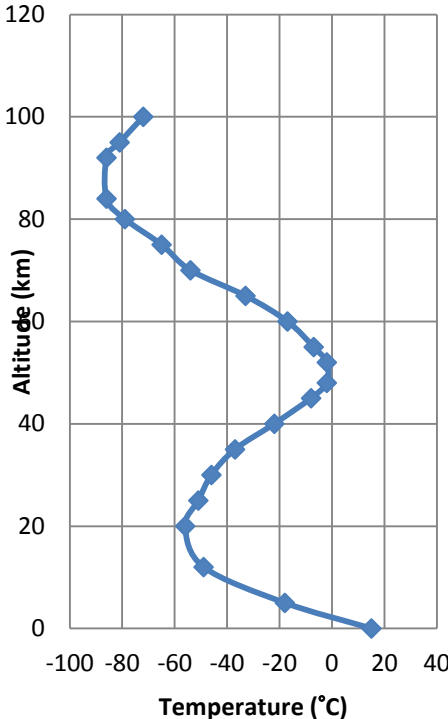
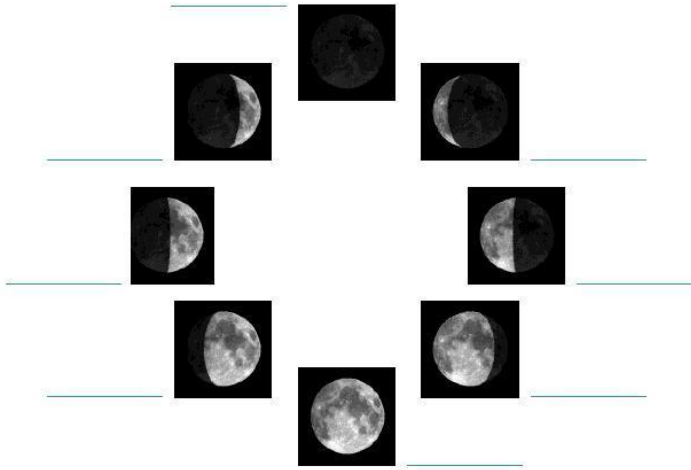
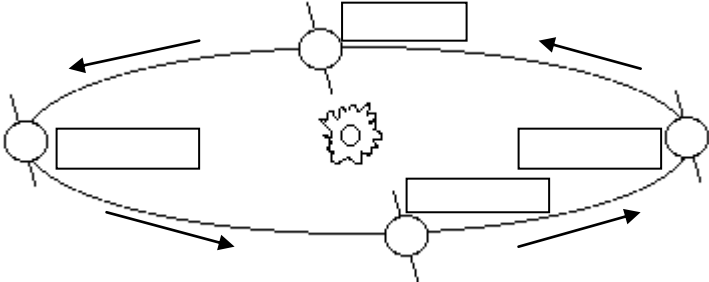


SOL Review and Study Guide

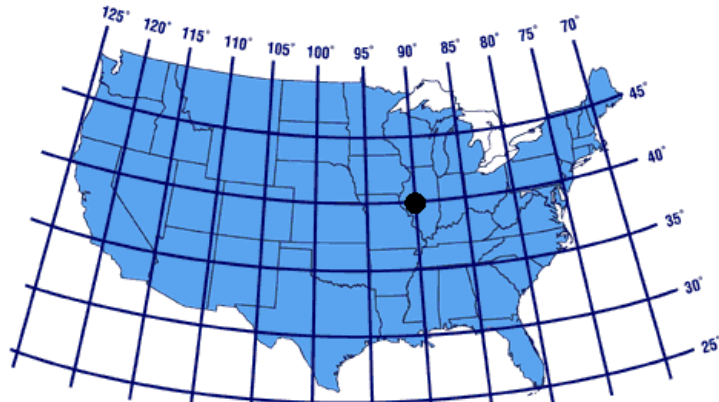

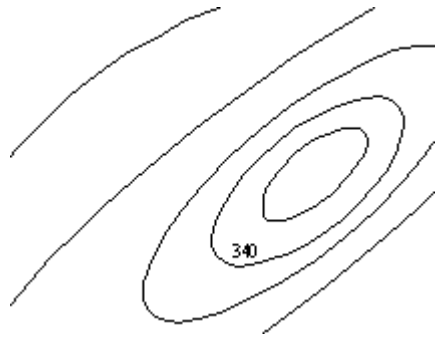
Unit 1 – Scientific Investigation	1.	Define these terms.	Independent Variable – Dependent Variable – Constant – Control –
	2.	Compare and contrast these terms.	Hypothesis - Theory - Law –
	3.	Compare and contrast these terms. Give an example of each.	Observation – Inference –
	4.	What is the metric unit for these measurements? What tools would you use to obtain these measurements?	Length – Area – Volume – Mass – Temperature –
	5.	Define density.	Density – Formula for density –
	6.	Solve the density problem. Show your work.	A block of aluminum has a volume of 17.0 mL and a mass of 45.9 g. What is its density?

Unit 1 – Scientific Investigation	7.	Using only the graph below, describe how temperature changes as the altitude in the atmosphere increases.																																												
	<div><p>Temperature vs Altitude</p><table data-bbox="267 329 712 1043"><caption>Data points estimated from the Temperature vs Altitude graph</caption><thead><tr><th>Altitude (km)</th><th>Temperature (°C)</th></tr></thead><tbody><tr><td>0</td><td>15</td></tr><tr><td>5</td><td>-10</td></tr><tr><td>10</td><td>-55</td></tr><tr><td>15</td><td>-65</td></tr><tr><td>20</td><td>-70</td></tr><tr><td>25</td><td>-60</td></tr><tr><td>30</td><td>-50</td></tr><tr><td>35</td><td>-40</td></tr><tr><td>40</td><td>-30</td></tr><tr><td>45</td><td>-20</td></tr><tr><td>50</td><td>-10</td></tr><tr><td>55</td><td>-5</td></tr><tr><td>60</td><td>-10</td></tr><tr><td>65</td><td>-20</td></tr><tr><td>70</td><td>-30</td></tr><tr><td>75</td><td>-40</td></tr><tr><td>80</td><td>-50</td></tr><tr><td>85</td><td>-60</td></tr><tr><td>90</td><td>-70</td></tr><tr><td>95</td><td>-80</td></tr><tr><td>100</td><td>-90</td></tr></tbody></table></div>			Altitude (km)	Temperature (°C)	0	15	5	-10	10	-55	15	-65	20	-70	25	-60	30	-50	35	-40	40	-30	45	-20	50	-10	55	-5	60	-10	65	-20	70	-30	75	-40	80	-50	85	-60	90	-70	95	-80	100
Altitude (km)	Temperature (°C)																																													
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Unit 2 - Astronomy	8.	Name the terrestrial (inner) planets and the gas (outer) planets.	Terrestrial: 1. 2. 3. 4.	Gaseous: 1. 2. 3. 4.																																										
	9.	Compare and contrast the terrestrial and gaseous planets in terms of characteristics such as density, relative number of moons, relative number of rings, size, etc.	Terrestrial Planets	Gaseous Planets																																										

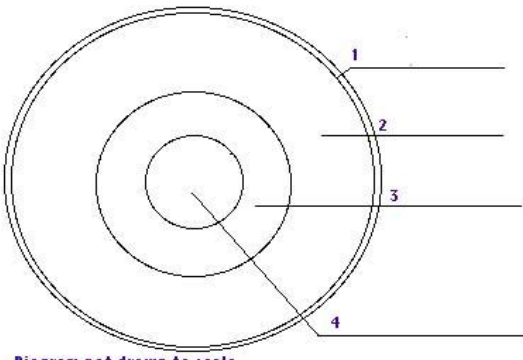
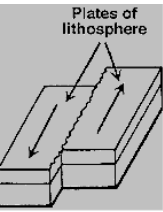
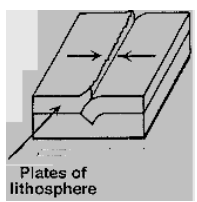
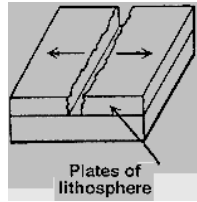
Unit 2 - Astronomy	10.	Name and describe the 3 types of galaxies.	1. 2. 3.
	11.	Draw and label the parts of a lunar eclipse. During which phase of the moon does this occur? Draw and label the parts of a solar eclipse. During which phase of the moon does this occur?	
	12.	Name these phases of the moon.	
	13.	Describe the Stellar Nebula Theory.	
	14.	Describe the Big Bang Theory.	
	15.	What is the process that causes the Sun to emit heat and light?	

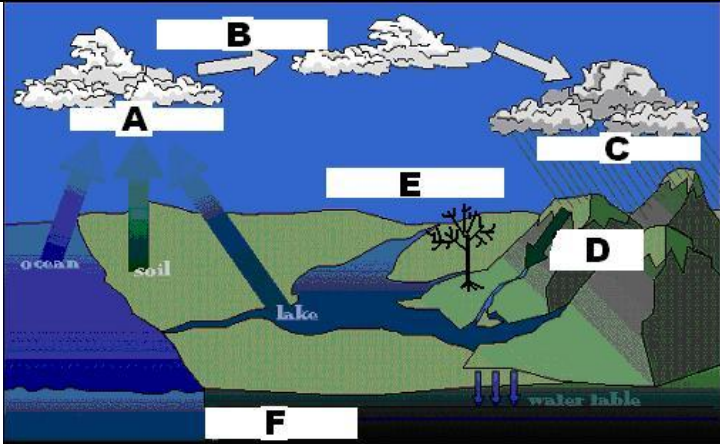
Unit 2 - Astronomy	16.	Compare and contrast the defining characteristics among moons, comets, meteoroids, and asteroids.	
	17.	Compare and contrast meteoroids, meteors, and meteorites.	
	18.	The diagram to the right shows the Earth in various positions around the sun at the center. Label each position which the correct season.	
	19.	Compare and contrast the atmospheres of Venus, Earth, and Mars and the resulting climates.	

Unit 2 - Astronomy	20.	Use the diagram to compare and contrast the life cycle of an average sized star with a massive sized star.	<table><tr><th>Average Size</th><th>Massive Size</th></tr><tr><td></td><td></td></tr></table>	Average Size	Massive Size		
	Average Size	Massive Size					
		<p>Life Cycle of a Star</p> <p>The diagram shows two paths starting from a Stellar Nebula:</p> <ul style="list-style-type: none">Average Star Path: Average Star → Red Giant → Planetary Nebula → White DwarfMassive Star Path: Massive Star → Red Supergiant → Supernova → Neutron Star or Black Hole					
	21.	<p>What is the diagram to the right called?</p> <p>What does it show and compare?</p> <p>What type of star is the Sun?</p>	<p>The H-R diagram plots Absolute Magnitude (Brightness) on the y-axis (increasing upwards) against Average Surface Temperature (°C) on the x-axis (decreasing from left to right). Key features include the Main sequence (diagonal band), Supergiants (top right), Giants (middle right), and White dwarfs (bottom left). The Sun is located on the main sequence between 5,000°C and 6,000°C.</p>				
Unit 3 – Mapping the Earth	22.	<p>Which of the cross sections best represents the elevations if you draw a line from point B to point C?</p> <p>How can you tell?</p> <p>What is the elevation on the top of Lookout Hill?</p> <p>In what general direction is the stream flowing?</p>	<p>The topographic map shows Lookout Hill with a contour line labeled 100. A Stream flows from the hill towards the OCEAN. Points A, B, and C are marked. A distance scale from 0 to 4 km and a north arrow are provided.</p> <p>The four cross-section options (A, B, C, D) show Elevation (m) on the y-axis (0 to 80) and the path from point B to point C on the x-axis. Each option shows a different profile of the land and ocean features.</p>				

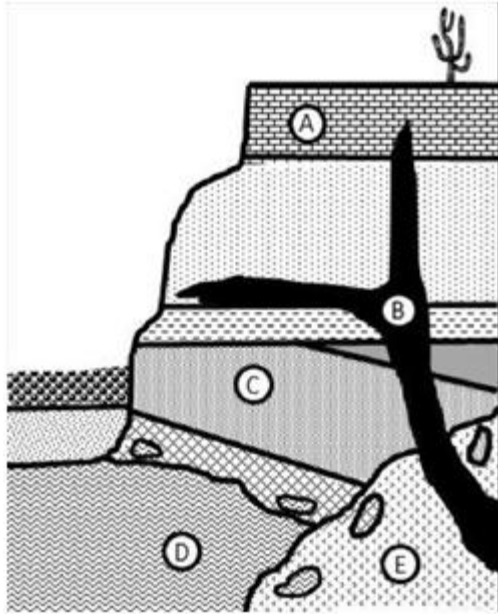
Unit 3 – Mapping the Earth	23.	Answer the questions about GPS.	<p>What is GPS?</p> <p>How does it work?</p> <p>What type of devices can it be found in?</p> <p>Who uses it?</p>
	24.	What are the latitude and longitude coordinates of the dot on the map to the right?	
	25.	Label the contour maps with the contour interval listed.	<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>Contour Interval = 20'</p> </div> <div style="text-align: center;">  <p>Contour Interval 15'</p> </div> </div>
Unit 4 – Minerals and Rocks	26.	Define the term. Include all parts of the definition.	Mineral –
	27.	Someone gave you a clear/whitish colored mineral and you want to find out what it is. You discover that it scratches your fingernail but doesn't scratch a penny. It has a white streak and a nonmetallic luster. Hydrochloric acid reacts with it.	<p>What is its hardness?</p> <p>How do you know?</p> <p>What is the name of the mineral?</p>

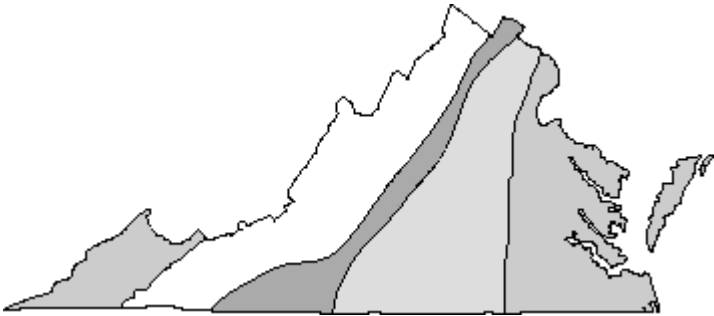
Unit 4 – Minerals and Rocks	28.	What are the characteristics/properties of minerals that we use when identifying them? Name at least 5 and describe them briefly.	1. 2. 3. 4. 5.
	29.	Draw and label the Rock Cycle. Include the processes required for a rock to move from one rock type to another.	
	30.	Compare and contrast intrusive and extrusive igneous rocks. Give an example of each.	Intrusive – Extrusive –
	31.	Define these two sedimentary rock types. Give an example of each.	Clastic – Non-clastic –

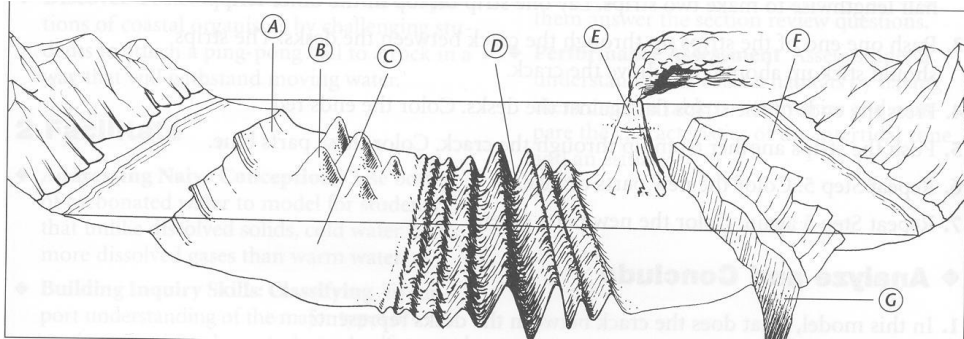
	32.	Define the two metamorphic rock types. Give an example of each.	Foliated – Unfoliated –
Unit 4 – Geologic Processes	33.	Label the layers of the Earth in the diagram on the right. What state of matter is each layer in? How do seismic waves help us understand the interior of the earth?	 <p>Diagram not drawn to scale</p>
	34.	Identify the 3 types of plate boundaries shown here.	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1.</p>  </div> <div style="text-align: center;"> <p>2.</p>  </div> <div style="text-align: center;"> <p>3.</p>  </div> </div>
	35.	Describe what happens when two oceanic plates converge. Include the landform and seafloor features that result. Give two examples of where this occurs (or has occurred in the past) on earth.	
	36.	Describe what happens when an oceanic plate converges with a continental plate. Include the landform and seafloor features that result. Give two examples of where this occurs (or has occurred in the past) on earth.	
	37.	Describe what happens when two continental plates converge. Include the landforms that result. Give two examples of where this occurs (or has occurred in the past) on earth.	
	38.	Describe what happens at a divergent boundary. Give two examples of this on earth.	
	39.	Describe what happens at a transform boundary. Give one example of this on earth.	

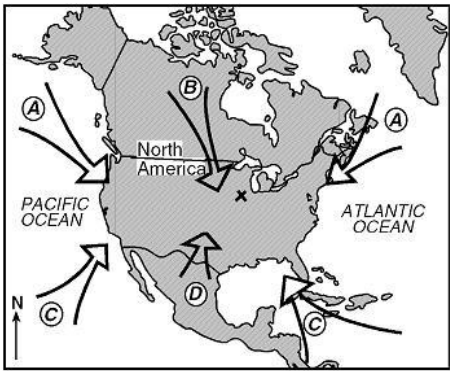
	40.	Is Hawaiian volcanism a result of the movement of plates at a plate boundary? Why or why not? What is this geologic phenomena called?	
	41.	Compare and contrast the volcanism/geothermal activity of Iceland, Mount St. Helens, Tambora, and Yellowstone.	
Unit 5 – Freshwater Resources	42.	Place the letter in the blank that corresponds to the process of the hydrologic cycle.	 <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> ____ Precipitation ____ Condensation ____ Run-off </div> <div> ____ Transpiration ____ Groundwater ____ Evaporation </div> </div>
	43.	Describe how caves and sinkholes form.	
	44.	Draw a diagram which shows the following features: water table, aquifer, zone of aeration, zone of saturation.	

	45.	What is the difference between a stalactite and a stalagmite? Where do they form? Draw each one and label it.	
	46.	Answer the questions on Karst Topography to the right.	<p>What type of rock is needed for the development of a Karst topography landscape?</p> <p>What type of weathering causes Karst topography to form?</p> <p>Which physiographic province in Virginia is known for this type of landscape?</p>
	47.	<p>Put these soil profiles in their correct order from first to last in the blanks below those profiles using A, B, C, D to identify the first formed to the last formed.</p> <p>What is soil made of?</p> <p>How does soil form?</p>	<p>The diagram shows four soil profiles labeled I, II, III, and IV, each with a corresponding description below it. Profile I shows a thick layer of organic matter (A horizon) over a B horizon, with parent material and C horizon below, all over bedrock. Profile II shows a thin layer of organic matter (A horizon) over a B horizon, with parent material and C horizon below, all over bedrock. Profile III shows a thin layer of organic matter (A horizon) over a B horizon, with parent material and C horizon below, all over bedrock. Profile IV shows a thin layer of organic matter (A horizon) over a B horizon, with parent material and C horizon below, all over bedrock.</p> <p>I Developed soil supports thick vegetation _____</p> <p>II Bedrock begins to disintegrate _____</p> <p>III Horizons form _____</p> <p>IV Organic materials speed up disintegration _____</p>
	48.	Name the 4 types of coal and put them in order of their formation, from first to last, softest to hardest, least desirable to most desirable, lowest heat output to highest heat output, fastest burning to slowest burning.	<p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p>
Unit 6 - Resources	49.	Name and describe 4 renewable energy sources.	<p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p>

	50.	Describe the difference between renewable and non-renewable resources.	
	51.	Name at least two natural resources in each of the provinces of Virginia.	Coastal Plain - Piedmont - Blue Ridge - Valley and Ridge - Appalachian Plateau -
Unit 7 – Historical Geology	52.	<p>List the rock layers in the section shown in order from oldest to youngest.</p> <p>Youngest _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Oldest _____</p> <p>_____</p>	
	53.	Define these terms.	<p>Law of Superposition –</p> <p>Law of Horizontality –</p> <p>Law of Cross-Cutting Relationships –</p>
	54.	Describe the differences between Relative Dating and Absolute Dating.	<p>Relative Dating –</p> <p>Absolute Dating –</p>

Unit 7 – Historical Geology	55.	Describe how life has become more complex over geologic time. Use a geologic timescale diagram to help you with this.	
	56.	Describe how each of the global catastrophes on the right affected the climate and life on earth. When did the two largest extinctions occur on earth?	Extreme volcanism like the Siberian Traps – Asteroid Impacts like Chicxulub – The Creation of Pangaea –
	57.	Define each of the fossil terms on the right. Which of the three major rock types will you most likely find fossils in? In which provinces are most of Virginia's fossils found? What are most of these fossils of?	Fossil – Mold – Cast – Original Remains – Trace Fossil –
Unit 8 – Virginia Geology	58.	Identify the 5 physiographic provinces of Virginia on the map shown to the right. Give one geologic fact about each province.	

Unit 8 – Virginia Geology	59.	What are the 6 states that make up the Chesapeake Bay watershed?			
	60.	Name the watershed in the southwestern part of the state.			
	61.	Name the other watershed in the southern and southeastern portion of the state.			
	62.	What is an estuary?			
	63.	Name at least three examples of the human impact on the Chesapeake Bay. Explain how the Chesapeake Bay is negatively affected by these human problems. Explain one potential solution for each.	Examples	Explain problem	Provide solution
Unit 9 - Oceanography	64.	Label the ocean floor features shown here.	<div></div> <div><div>A.</div><div>B.</div><div>C.</div><div>D.</div><div>E.</div><div>F.</div><div>G.</div></div>		
	65.	How much of Earth's water is salt water? (What percent?)			
	66.	What is upwelling and why is it important?			

Unit 9 - Oceanography	67.	<p>What is the difference between a spring tide and a neap tide?</p> <p>Draw a diagram of the position of the Sun, Earth, and Moon for both a spring tide and a neap tide.</p>	
	68.	Describe the relative temperature of major ocean currents on the western boundary of continents vs. the eastern boundary of continents, and explain how these affect the climate.	
	69.	List at least 3 types of human impacts on the oceans and explain what effects they have on the oceans.	
	70.	Explain the relationships between temperature, salinity, and density, and explain how changes in density cause deep water circulation.	
Unit 10 - Meteorology	71.	<p>Name the types of air masses shown in this picture.</p>  <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">A.</div> <div style="text-align: center;">B.</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">C.</div> <div style="text-align: center;">D.</div> </div>	

Unit 10 - Meteorology	76.	Compare and contrast weather and climate.	
	77.	List at least four factors that affect climate, and describe those effects.	
	78.	What are the conditions needed for cloud formation?	
	79.	Compare and contrast hurricanes and tornadoes	
	80.	Use the station model to identify the following: Temperature: Dew Point: Precipitation type: Wind speed: Wind Direction: Cloud Cover: Air Pressure (converted to mb): Change in Air pressure:	

Concept Checks – First Semester

Review the list of terms below. For each one, determine how well you understand the term or the concept that it represents after having completed the review questions on the previous pages.

If you understand it thoroughly, place a check (✓) in the space next to it. If you have heard of it but are less certain about it, place a plus (+) in the space next to it. If you've never heard of it or simply can't seem to understand it, place an 'o' in the space next to it. Let the 'o' items help focus your studying.

✓/+/o	Concept	✓/+/o	Concept	✓/+/o	Concept
	hypothesis		intrusive		lava
	theory		sedimentary		hot spot
	law		clastic		weathering
	independent variable		non-clastic		deposition
	dependent variable		metamorphic		delta
	constant		foliated		flood plain
	control		non-foliated		moraine
	conclusion		sediment		velocity
	research		weathering/erosion		particle size
	trial		cementation/compaction		carrying ability
	table		heat/pressure		horizon
	graph		plate tectonics		oxidation
	metric		continental drift		exfoliation
	mass		seafloor spreading		ice wedging
	volume		convergent boundary		soil profile
	density		divergent boundary		karst
	area		transform boundary		sinkhole
	length		faulting		stalactite
	temperature		folding		stalagmite
	weight		subduction		permeable
	solid		convection		impermeable
	liquid		rifting/rift valley		aquifer
	gas		focus		artesian well
	plasma		epicenter		zone of aeration
	map		earthquake		zone of saturation
	longitude		seismic waves (P,S,L)		groundwater
	latitude		normal fault		hydrologic cycle
	legend		reverse fault		spring
	contour		strike-slip fault		hydrolysis
	contour interval		island arc		carbonic acid
	map scale		trench		energy
	compass rose		shield volcano		resource
	topographic map		composite volcano		renewable
	elevation		cinder cone volcano		non-renewable
	profile		compression force		geothermal energy
	hachure		tension force		wind energy
	coordinates		shearing force		hydroelectric energy
	mineral		Richter Scale		solar energy
	color		Mercalli Scale		nuclear energy
	hardness		inner core		peat
	streak		outer core		lignite
	luster		mantle		bituminous
	cleavage		crust		anthracite
	fracture		continental crust		coal
	rock cycle		oceanic crust		fossil fuel
	igneous		mid-ocean ridge		alternative fuel
	extrusive		magma		ozone layer

Concept Checks – Second Semester

Review the list of terms below. For each one, determine how well you understand the term or the concept that it represents after having completed the review questions on the previous pages.

If you understand it thoroughly, place a check (✓) in the space next to it. If you have heard of it but are less certain about it, place a plus (+) in the space next to it. If you've never heard of it or simply can't seem to understand it, place an 'o' in the space next to it. Let the 'o' items help focus your studying.

✓/+/o	Concept	✓/+/o	Concept	✓/+/o	Concept
	fossil formation		trench		chromosphere
	fossil types		ocean resources		nebula
	fossil location (rock)		human impact on oceans		
	relative dating		troposphere		
	absolute dating		stratosphere		
	rock layer correlation		mesosphere		
	superposition		thermosphere		
	cross-cutting		barometer		
	unconformity		psychrometer		
	horizontality		cP		
	radioactive decay		mP		
	half-life		cT		
	carbon-14 dating		mT		
	coastal plain		cold front		
	piedmont		warm front		
	blue ridge		occluded front		
	valley & ridge		stationary front		
	Appalachian plateau		air pressure		
	VA topography		Coriolis Effect		
	Chesapeake Bay		hurricane		
	watershed		tornado		
	drainage area		thunderstorms		
	estuary		greenhouse effect		
	VA resources		ozone		
	Bay pollution		solar system		
	salinity		planet		
	density		comet		
	thermocline		asteroid		
	wind driven current		meteor		
	parts of a wave		meteorite		
	cause of tides		solar eclipse		
	neap tide		lunar eclipse		
	spring tide		Stellar Nebula Theory		
	ocean origin		Big Bang Theory		
	tsunami		H-R Diagram		
	upwelling		Hubble Tuning Fork		
	convection current		spiral galaxy		
	ocean/climate relationship		barred spiral galaxy		
	ocean as a heat reservoir		elliptical galaxy		
	guyot		irregular galaxy		
	abyssal plain		life cycle of stars		
	sea mount		phases of the moon		
	continental shelf		rotation		
	continental slope		revolution		
	mid ocean ridge		corona		
			photosphere		