

## Final Study Guide Questions

Geology/Earth Science

Spring 2007

Mr. Traeger

The following questions are similar to questions that will be asked on the final exam. The topics are in the order in which we covered them. Please go through your book and answer them as a way to review for the final. **Anything with an asterisk (\*) next to it means that only geology is responsible for knowing it.**

Section	Topic	Questions to Ponder
<b>Chapter 25 and Section 24.3: Earth's Moon</b>		
25.1	Origin and Properties of the Moon	<ul style="list-style-type: none"> <li>▪ What is the impact theory and how does it explain the formation of the moon?</li> <li>▪ What are the surface features on the moon?</li> <li>▪ How do the rocks found on the moon similar to those on Earth?</li> <li>▪ What is your weight on the moon compared to here on Earth?</li> <li>▪ *How do you use <math>F_{\text{gravity}} = Gm_1m_2/r^2</math> to calculate your weight on the moon or another planet?</li> </ul>
25.2	The Moon's Motions	<ul style="list-style-type: none"> <li>▪ How does the moon orbit the Earth?</li> <li>▪ How many minutes later does the moon rise each day/night?</li> <li>▪ What are the phases of the moon? Waxing, waning, gibbous, crescent, full moon, new moon, first quarter, third quarter?</li> <li>▪ What are lunar eclipses and how do they form?</li> <li>▪ What are solar eclipses and how do they form?</li> </ul>
24.3	Tides	<ul style="list-style-type: none"> <li>▪ What causes tides?</li> <li>▪ What are spring tides and in what phases of the moon do they occur?</li> <li>▪ What are neap tides and in what phases of the moon do they occur?</li> <li>▪ What has more effect on tides? The moon or the sun?</li> <li>▪ *Know how to calculate the comparative tidal force of the moon and the sun using <math>F_{\text{gravity}} = Gm_1m_2/r^3</math></li> </ul>
<b>Chapter 4: Earth's Motion</b>		
4.2	Earth's Rotation	<ul style="list-style-type: none"> <li>▪ Who was Jean Foucault and what did he do?</li> <li>▪ Who was Gaspard Coriolis and what did he do? In other words: What is the Coriolis Effect?</li> <li>▪ What is the evidence for earth's rotation?</li> <li>▪ What is the difference between rotation and revolution?</li> <li>▪ In what direction does Earth rotate? West to East or East to West?</li> <li>▪ How did the ancient people measure time?</li> <li>▪ How many time zones are there? Why do we use time zones?</li> </ul>
4.3	Earth's Revolution	<ul style="list-style-type: none"> <li>▪ What is the evidence that Earth is revolving around the sun?</li> <li>▪ What are the reasons for the seasons?</li> <li>▪ What time of year are we closest to the sun? Farthest?</li> </ul>
<b>Chapter 26: The Sun and the Solar System</b>		
26.1	Sun's heat, size, and structure	<ul style="list-style-type: none"> <li>▪ What is nuclear fusion and how does it create energy in the core of the sun?</li> <li>▪ What are the different layers of the sun? Be able to diagram them!</li> <li>▪ What are sunspots and how hot are they?</li> <li>▪ What is the solar wind and how does it cause the northern lights (aurora borealis)?</li> <li>▪ What is the UV Index? What do we use it for?</li> <li>▪ What are variables that determine how the UV Index is calculated?</li> <li>▪ Why is it so necessary to wear sunscreen, a hat, and sunglasses?</li> </ul>
26.2	History of Solar System and Planetary Orbits	<ul style="list-style-type: none"> <li>▪ What is the geocentric model?</li> <li>▪ What is the heliocentric model?</li> <li>▪ Who are Ptolemy, Copernicus, Brahe, Kepler, Galileo, and Newton? What did each one of them do?</li> <li>▪ What are Kepler's Three Laws of Planetary Motion and what do they mean?</li> <li>▪ *How do you calculate eccentricity using <math>e = c/a</math>?</li> <li>▪ *How do you calculate the period of revolution of a planet going around the sun using <math>p^2 = a^3</math>?</li> <li>▪ What is an astronomical unit (AU) and when do we use it?</li> <li>▪ *How do we convert from Kilometers to AU's or AU's to Kilometers?</li> <li>▪ What are the basic properties of an ellipse?</li> <li>▪ What does Newton's Law of Gravitation say?</li> </ul>
<b>Chapter 27: The Planets and the Solar System</b>		

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27.1	Inner Planets	<ul style="list-style-type: none"> <li>▪ What are the inner planets?</li> <li>▪ What are the characteristics of the inner planets? Are they solid or gas?</li> <li>▪ Which of the inner planets have moons? What are they?</li> <li>▪ Which planets have atmospheres, volcanoes, etc?</li> <li>▪ Which planets are only visible from earth either in the morning or the evening?</li> <li>▪ Which planets might have had life other than earth?</li> <li>▪ What are the basic ingredients needed for life on a planet to occur?</li> </ul>
27.2	Outer Planets	<ul style="list-style-type: none"> <li>▪ What are the outer planets?</li> <li>▪ What are the characteristics of the outer planets? Are they solid or gas?</li> <li>▪ Do all of the outer planets have moons? What are the main moons of each planet and what are their characteristics?</li> <li>▪ Why was Pluto demoted from a planet to a dwarf planet?</li> <li>▪ What are the Roman mythological name origins of the planets?</li> </ul>
27.3	Planetary Satellites	<ul style="list-style-type: none"> <li>▪ What are the characteristics of the main moons of each planet?</li> </ul>
27.4	Solar System Debris	<ul style="list-style-type: none"> <li>▪ What are comets? How and where do they orbit the sun?</li> <li>▪ What are asteroids? How and where do they orbit the sun?</li> <li>▪ What are the differences among meteors, meteoroids, and meteorites?</li> </ul>
<b>Chapter 28: Stars and Galaxies</b>		
28.1	Light	<ul style="list-style-type: none"> <li>▪ What is light? Does it only exist in the form we can see?</li> <li>▪ What is the electromagnetic spectrum? Know the different parts of this! (e) Infrared, Visible, etc.</li> <li>▪ Why do we use different parts of the spectrum in astronomy?</li> <li>▪ What are continuous, emission, and absorption spectra?</li> <li>▪ How can we figure out a star's chemistry based upon the light that we receive from it?</li> <li>▪ What is the Doppler Effect and how do we use it to gauge the expansion of the Universe?</li> <li>▪ What is red shift? What is blue shift? What do they tell us?</li> <li>▪ *How can we use the Doppler Effect to calculate the velocity and direction of a galaxy using <math>v = \lambda \times C/\lambda_0</math></li> </ul>
28.2	Stars and Their Characteristics	<ul style="list-style-type: none"> <li>▪ What is the difference between astronomy and astrology?</li> <li>▪ What determines a person's sign of the zodiac?</li> <li>▪ What are constellations? Do the same constellations appear throughout the whole year?</li> <li>▪ What is significant about the North Star (Polaris)?</li> <li>▪ What is the apparent magnitude of a star? How is it different from absolute magnitude?</li> <li>▪ What is a light year? How far away is one light year?</li> <li>▪ What is parallax and how do we use it to measure distances to stars?</li> <li>▪ *How do we measure distance using <math>d = 1/p</math>?</li> <li>▪ *How do we convert from parsecs to light years?</li> <li>▪ What stars are hotter? Blue, yellow, white, or red?</li> <li>▪ *How can we use Wien's Law (<math>\lambda_{max} = 2,900,000/\text{Temperature}</math>) to find the peak emission wavelength (color) of a star in nanometers?</li> <li>▪ What is luminosity and absolute magnitude?</li> </ul>
28.3	Life Cycles of Stars	<ul style="list-style-type: none"> <li>▪ What is the Hertzsprung-Russell (H-R) diagram and how do we use it to know the life stage of a star?</li> <li>▪ How is a star born?</li> <li>▪ How do stars live their main sequence lives?</li> <li>▪ How do stars die? (See life cycle of stars on pages 628-629)</li> <li>▪ What are the remains of stars? Black Holes, etc.</li> <li>▪ What is a black hole? Why are they black?</li> <li>▪ *What is the event horizon? Schwarzschild Radius? Singularity?</li> <li>▪ *How do we calculate Schwarzschild radius of a black hole using the formula <math>r_s = 2Gm/c^2</math>?</li> <li>▪ How do gravity and fusion determine the size of a star?</li> <li>▪ Which stars burn fuel quicker and die younger in a supernova?</li> <li>▪ What will be the fate of our sun, a main sequence star?</li> </ul>
28.4	Galaxies and the Universe	<ul style="list-style-type: none"> <li>▪ What are galaxies and what are the different types of galaxies?</li> <li>▪ What is the theory for the origin of the Universe? How did we get to this theory?</li> <li>▪ Is our Universe expanding? How do we know?</li> </ul>

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<b>Chapter 17: Atmosphere</b>		
17.1	Atmosphere in Balance	<ul style="list-style-type: none"> <li>▪ What is the basic chemical composition of the atmosphere?</li> <li>▪ How do materials such as water, carbon dioxide, and oxygen get cycled through the atmosphere?</li> </ul>
17.2	Heat and the Atmosphere	<ul style="list-style-type: none"> <li>▪ How does heat move through conduction, convection, and radiation?</li> <li>▪ What is the difference between heat and temperature?</li> <li>▪ What is the basic structure of the atmosphere? (see page 370-371)</li> <li>▪ What are the different layers of the atmosphere and what are some characteristics of each layer?</li> <li>▪ What is a heat budget? Can you balance one?</li> <li>▪ What is global warming? What are the natural causes? What are the human causes? What are the effects?</li> <li>▪ What is the difference between weather and climate?</li> <li>▪ What are some basic causes for climate change, both human and non-human? See page 474-477.</li> </ul>
17.3	Local Temperature Variations	<ul style="list-style-type: none"> <li>▪ How is the intensity of sunlight received affected by time of day, latitude, time of year, and cloud cover?</li> <li>▪ What is the difference between heating land surfaces and heating water surfaces? How does this affect local temperature ranges?</li> <li>▪ *What is specific heat capacity? How do you calculate it using <math>q = mc_s \Delta T</math>?</li> </ul>
17.4	Human Impact on the Atmosphere	<ul style="list-style-type: none"> <li>▪ What is air pollution and what are common pollutants?</li> <li>▪ What is acid rain and what does it do?</li> <li>▪ What is a temperature inversion and how does it cause smog?</li> <li>▪ What is Ozone Layer Depletion, what causes it, where does it occur, and how is it <i>different</i> from global warming?</li> <li>▪ How is ocean density affected when temperature rises? Falls?</li> <li>▪ How is ocean density affected when salinity rises? Falls?</li> <li>▪ What is ocean thermohaline circulation? Why is it so important in the movie <i>Inconvenient Truth</i>?</li> </ul>
<b>Chapter 18: Water in the Atmosphere</b>		
18.1	Humidity and Condensation	<ul style="list-style-type: none"> <li>▪ What are the basic characteristics of the water molecule?</li> <li>▪ What are the phase changes of water?</li> <li>▪ What is humidity? What is the difference between specific humidity and relative humidity?</li> <li>▪ How do we measure relative humidity?</li> <li>▪ What happens when the temperature and dew point are the same?</li> <li>▪ What are condensation nuclei? Remember the cloud in a bottle demo?</li> <li>▪ What are the different types of fog?</li> </ul>
18.2	Clouds	<ul style="list-style-type: none"> <li>▪ What are three things required to form a cloud? Remember demo?</li> <li>▪ What are the different types of clouds and the methods by which they are classified?</li> <li>▪ *How can we predict the elevation where a cloud will form? Geology: Know how to do the math!</li> <li>▪ How do thunderstorms and lightning occur? What are the hazards?</li> </ul>
18.3	Precipitation	<ul style="list-style-type: none"> <li>▪ How do the different types of precipitation form?</li> <li>▪ What are the different kinds of precipitation and what are their characteristics?</li> <li>▪ How do we measure precipitation?</li> <li>▪ Where does precipitation occur geographically?</li> <li>▪ What is the rain shadow effect? See page 404</li> <li>▪ What are the two factors responsible for differences in precipitation amounts in California?</li> <li>▪ What is El Niño? How does it occur? What are its effects? How do we monitor it? See page 468.</li> </ul>
<b>Chapter 19: Atmosphere in Motion</b>		
19.1	Air Pressure and Wind	<ul style="list-style-type: none"> <li>▪ What is air pressure?</li> <li>▪ *What does Dalton's Law of Partial Pressures say?</li> <li>▪ How do we measure air pressure?</li> <li>▪ How do we record air pressure?</li> <li>▪ How does air pressure change?</li> <li>▪ What are isobars and how can you use these to figure where areas of low and high pressure are?</li> <li>▪ What makes the wind blow?</li> <li>▪ How do we measure wind?</li> </ul>

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19.2	Factors Affecting Wind	<ul style="list-style-type: none"> <li>▪ What is the Coriolis Effect?</li> <li>▪ Which way will winds and ocean currents turn in the Northern Hemisphere? Southern Hemisphere? Equator?</li> <li>▪ Which direction will high pressure and low pressure spin in the Northern Hemisphere? How about in the Southern Hemisphere?</li> <li>▪ What is the Jet Stream and how does it affect our weather?</li> </ul>
19.3	Global Wind Patterns	<ul style="list-style-type: none"> <li>▪ What are the effects of earth's rotation?</li> <li>▪ What is the three-celled circulation model?</li> <li>▪ What are the general areas of high and low pressure?</li> <li>▪ What are the main wind belts?</li> </ul>
19.4	Continental and Local Winds	<ul style="list-style-type: none"> <li>▪ What is the monsoon in India?</li> <li>▪ What are sea breezes and how are they caused?</li> <li>▪ What are land breezes and how are they caused?</li> </ul>
<b>Chapter 20: Weather</b>		
20.1-20.5	Weather	<ul style="list-style-type: none"> <li>▪ Know about air masses and fronts</li> <li>▪ You should know about thunderstorms, tornadoes, hurricanes, and pacific winter storms.</li> <li>▪ What are some basic tools and procedures for forecasting weather?</li> </ul>
<b>Chapter 21: Climate and Climate Change</b>		
21.1	What is Climate?	<ul style="list-style-type: none"> <li>▪ What are the two main characteristics of an area's climate?</li> <li>▪ What are three other characteristics of an area's climate?</li> <li>▪ What are the six controls that control the climate of a certain area?</li> </ul>
21.2	Climate Zones	<ul style="list-style-type: none"> <li>▪ What are the six major climate zones around the world?</li> <li>▪ What are the characteristics of the six major climate zones?</li> </ul>
21.3	Climate Change	<ul style="list-style-type: none"> <li>▪ What have happened to Earth's temperatures over the past 420,000 years? How does this relate to carbon dioxide levels?</li> <li>▪ How do the shape of Earth's orbit around the Sun, tilt of Earth's axis, and precession of Earth's axis change Earth's climate?</li> <li>▪ How do plate tectonics cause climate change?</li> <li>▪ How do sunspots on the Sun affect Earth's climate?</li> <li>▪ How can volcanic eruptions affect Earth's climate?</li> <li>▪ How do humans affect climate change?</li> <li>▪ How do sea floor sediments help us to know about past climates?</li> <li>▪ How do glacial ice cores help us to know about past climates?</li> <li>▪ How do tree growth rings help us to know about past climates?</li> </ul>

**Geology/Earth Science Final Exam Schedule for Spring Semester 2007**

Date	Period	Who Takes It?	Subject	Time
Thursday, 6/14/07	2	Seniors Only	Earth Science	7:50-9:52
Thursday, 6/14/07	5	EVERYONE	Geology	12:35-2:37
Friday, 6/15/07	6	EVERYONE	Geology	12:35-2:37
Monday, 6/18/07	3	EVERYONE	Geology	7:50-9:55
Monday, 6/18/07	4	EVERYONE	Earth Science	10:20-12:25
Tuesday, 6/19/07	2	EVERYONE	Earth Science	7:50-9:55

**Frequently Asked Questions about Traeger's Final Exam**

- What should I bring to the final? Bring your brain, a #2 pencil, a calculator (especially important for geology) and any work that is due on the final day.
- What items are NOT allowed to be in use during the test? Notes, cheat sheets, cell phones, iPods, your moving mouth, and wandering eyes are not allowed on the final.
- How much of my semester grade is the final worth? The final exam will be about 12-15% of your overall semester grade. The final exam will be included in the test category.
- What if I need extra time? There will be plenty of time to take the test.
- What is the format of the test? The test will be all multiple choice/true false/matching. I do not have time to grade a written portion on the Spring Final Exam.
- What is the best way to study for this test? Use this review sheet and answer EVERY question if you want 20 points added to your final exam grade. Use your book and the class website [PowerPoint notes](#).
- If I took the final on the Senior Final Day and I am not a Senior, do I have to show up on the scheduled final day? You betchya! If you don't show up for the scheduled final day, you will lose points for the activity we do on that day. This could mean the difference between an A or a B, B or a C, C or a D, D or an F!
- How do I get help studying for the final? Email Mr. Traeger at [traeger@lcusd.net](mailto:traeger@lcusd.net) or come by after school!