

# Mid-Term Earth Science Review Sheet

## Density

Know these vocabulary words:

error  
~~percent error (or deviation)~~  
volume  
mass  
density  
phase (state of matter)

Be able to answer the following questions:

1. ~~Be able to determine percent error (deviation).~~  
FORMULA:

~~ex. If the mass of an object was measured in error to be 65 g and the accepted value is 70 g, what is the percent error? Don't forget the units!~~

3. ~~Be able to find the volume of a regularly shaped object.~~  
FORMULA:

~~ex. length = 2 cm, width = 1 cm and height = 3 cm~~

4. Know how to determine the density of regular, irregularly shaped solids and fluids.  
ex 1. If the mass of a baseball is 4 g and its volume is  $10 \text{ cm}^3$ , what is its density?

ex 2. If a beaker of orange juice weighs 10 g and beaker with the juice is 60 g, what is the density of the orange juice if there was 25 ml of juice in the beaker?

5. How does the density of an object change when the following factors change?

change in state (along with temperature change)

mass

volume

6. Know that if you cut something in half, its density does NOT change!!!!

7. Remember that less dense objects float on more dense fluids.

8. Water expands as it begins to freeze ( $4^{\circ}\text{C}$ ).

ex. Is ice more or less dense than water?

## Mapping

*Know these vocabulary words:*

coordinate system

equator

latitude

parallel

longitude

meridians

prime meridian

field

isolines

contour lines

contour interval

topographic profile

gradient

*Be able to answer the following questions:*

1. Know the difference between latitude and longitude.

ex. The equator is an example of \_\_\_\_\_ .

2. How do we write coordinates on a map? Be able to pick out locations on a map based on their coordinates.

ex. What are the coordinates of New Paltz to the nearest minute?

3. Be able to interpret contour lines.  
ex. How do you determine the minimum and maximum height of a mountaintop, if the highest index contour was 11500 ft and the contour interval was 20 ft.?
4. Understand that the elevation of a point between two contour lines is estimated ~~to be its average height.~~
5. Know the rules of contour lines. (Especially in terms of slope steepness and river flow direction.)
6. Know how to use a map scale to find distances on a map to the nearest tenth of a kilometer or mile.  
ex. How do you find the distance of a curved road?
7. Know how to determine the gradient on a map.  
ex. If X is 25 ft in elevation, Y is 35 ft high, and the distance between X and Y is 2 miles, what is its gradient?
8. Know how to draw an isomap.  
ex. What principles do you have to keep in mind to create a good map?
9. Be able to draw the profile of a map between two points.

## Minerals and Rocks

*Understand the following vocabulary words:*

mineral  
inorganic  
crystal  
hardness  
Moh's scale of hardness  
streak  
cleavage  
fracture  
luster  
mineral family  
silicate family

rocks  
intrusive (plutonic igneous)  
extrusive (volcanic igneous)  
magma  
lava  
clastic (fragmental)  
organic sedimentary  
chemical sedimentary  
sediment  
cement  
fossil  
evaporite  
metamorphism  
foliated  
banding  
non-foliated  
mafic  
felsic  
fossil fuels

*Know the answer to the following questions:*

1. Define a mineral.  
ex. What two things do the composition and internal arrangement of atoms determine in a crystal?
2. Know that the silicate family is the most abundant family of minerals. Some members of the silicate family include quartz, mica and feldspar.  
ex. What two elements are found in silicates? (They are also the most common elements in the Earth's crust).
3. What are the features of a mineral that are useful in its identification? Know how to use Moh's hardness scale and the relative hardness of minerals on the scale  
ex. Is 3 or 2 harder on the Moh's scale?
4. Know that only a dozen minerals make up most of the rocks in the world.
5. Compare and contrast intrusive (plutonic) and extrusive (volcanic) igneous rocks in terms of their texture and where they formed.
6. Know how cooling rate of magma effects the crystal size of the intrusive plutonic rock.  
ex. The slower the cooling the \_\_\_\_\_ the crystal.

7. Be able to answer questions on igneous, sedimentary and metamorphic rocks using the information found in the Earth Science Reference Tables.

ex. 1. Name two minerals found granite, but not gabbro.

ex. 2. Name a chemical sedimentary rock that is made up of only one mineral (monomineralic).

ex. 3. Which metamorphic rock has undergone more heat and pressure-gneiss or schist?

8. Describe how the three types of sedimentary rocks are formed and how to identify them by their characteristics.

9. Know what size fragments shale, sandstone and conglomerates are made from.

ex. What rock type is made from sediments .001 cm in diameter?

10. Describe the conditions under which metamorphic rocks form and their typical characteristics. Do they ever melt?

11. Identify the metamorphic rocks that form from granite, shale, slate, schist, limestone and sandstone.

12. Know the significant history of how each rock type formed and where you would expect to find them. Use the Reference Tables!

ex 1. Granite is formed from slowing cooling \_\_\_\_\_ and is commonly found \_\_\_\_\_ .

ex 2. Sandstone is formed from sand sized \_\_\_\_\_ that were deposited \_\_\_\_\_ .

ex. 3. Gneiss is formed from heat and \_\_\_\_\_ and is found deep \_\_\_\_\_ .

ex. 4. Rock salt formed when \_\_\_\_\_ evaporated.

13. Why is our dependence on fossil fuels a growing problem and what are some alternatives? How did fossil fuels form?

# Earthquakes and Plate Tectonics

Define the following vocabulary words.

continental crust  
~~continental drift~~  
convection current  
convergent boundary  
divergent boundary  
Mid-Atlantic Ridge  
mid-ocean ridges  
oceanic crust  
Pangaea  
plate tectonics  
rift zone  
~~sea-floor spreading~~  
subduction zone  
transform fault boundary  
trench  
~~Alfred Wagener~~  
crust  
mantle  
outer core  
mantle  
lithosphere  
asthenosphere  
earthquake  
epicenter  
focus  
Mercalli scale  
P-wave  
Richter scale  
Ring of Fire  
S-wave

Review the following concepts:

- ~~1. List what evidence supports continental drift.~~
- ~~2. Understand the significance of polar magnetic reversals, where evidence of it is found and how it supports the Plate Tectonics theory.~~
- ~~3. Know the relative age distribution of the Atlantic ocean rocks and how their age compares to continental rocks.~~
4. Study how convection currents move the plates.

5. Review how continental crust differs from ocean crust.
6. Describe the difference between a divergent, convergent, and transform fault plate boundaries. Also know what land form is created at each type of plate boundary and be able to give an example of each.
7. Describe what happens at a subduction zone and how density differences between the ocean and continental plates effect what happens when they collide.
8. Be able to locate the name of the tectonic plates using the reference table.  
ex. What is the name of the plate that we live on?
9. Using the reference table, be able to determine the type of plate boundary given a certain location.  
ex. 1. What type of plate boundary is Japan located on?  
ex. 2. What type of plate boundary is the Andes located on?
10. Know how to find the density, temperature and pressure of each layer of the Earth using the reference tables.  
ex. 1. What is the density of the outer core?  
ex. 2. What is the temperature of the inner core?  
ex. 3. Where is the temperature of the inner Earth higher than the melting point temperature? (Hint: Therefore the layer is in a liquid state).
11. How does density and pressure change as you get closer to the center of the Earth?
12. How do we know the outer core is liquid?
13. Where do most earthquakes and volcanoes occur?
14. How do earthquakes form?
15. How do seismologists locate the epicenter of an earthquake?
16. How do P-waves differ from S waves?

17. How do earthquakes put lives in danger and how can we minimize the damage done during an earthquake?
18. How is the Richter Scale and Mercalli scale used and what does it measure?
19. Know how to compute the distance to an earthquake given the arrival times of the P and S waves.
  - ex 1. If the P and S-waves were 4 minutes apart, how far away would the earthquake be?
  - ex. 2. If the distance to an earthquake is 2000 km, what is the difference in arrival time for the P and S waves? What is the P wave travel time?
  - ex. 3. If the P-waves took 4 minutes to arrive at a seismic station, how long did it take the S-waves to arrive?
21. How many seismograph station recordings are needed to pin-point the location of an earthquake?