# Name:

Date:

Period:

Density and Structure Study Guide

**Studying for Extra Credit (worth 3% on the test):**

# I have studied and gone over this study guide with my student for at least 30 min.

Parent Signature

Density

1. What is density? Give at least two definitions.

The amount of mass in a certain volume, how close together atoms are, amount of stuff in a certain space

# What is the equation used to find density?

M/V (mass divided by volume)

# Which two instruments/tools do you need in order to find the density of an object?

A balance/scale and a graduated cylinder

# What is the unit for measuring density?

The unit for measuring density is just a combination of the units used for measuring the mass and volume. If you used Kg and m3 then the unit will be Kg/m3

# If an object has a mass of 15 g and a volume of 3 mL, what is its density? **Include the units.**

5 g/mL

1. If an object has a mass of 5 kg and a volume of 500 cm3 what is its density? **Include the units.**

.01 Kg/cm3

# What is the density of water? *1 g/mL*

1. Why do things sink or float? *They are less dense than the material they are in*
2. Why does an egg sink in water and float in salt water? *Salt water is more dense than regular water*
3. Are heavy things always denser than light things? *No. 500 pounds of Styrofoam would still be less dense than a small rock that only weighs 1 pound.*

# Would slicing an object in half change its density? **Explain.**

No! Slicing an object in half wouldn’t change the spacing of the atoms at all. 

# How does temperature affect the density of an object?

As temperature increases, the density will decrease.

# Why does hot air/water rise?

It is less dense than the cooler air around it.

# What substance is the exception to the fact that things contract/get more dense when they freeze?

Ice. Water molecules actually get farther apart when the water freezes and that causes the material to be less

dense.

# Density and Sorting

1. Which two things affect how substances in streambeds, lakes, beaches etc. naturally sort themselves?

Size and density

# If you were to put a scoop full of gravel, sand, and topsoil into an empty jar and shake it for a while, where would you expect things to end up?

The sand would filter towards the bottom, gravel would be on top of the sand, and the least dense material

(topsoil) would be on top

# If you were to put a scoop full of gravel, sand, and topsoil into a jar of water and shake it up, where would things land?

The least dense material (topsoil) would be on top, the more dense things (gravel and sand) would be towards

the bottom. Gravel would be on the very bottom since it falls so quickly in water, sand would mostly be on top of the gravel since the water would slow it down

# How could you possibly predict where a solid object would land if it were dropped into a density column?

Compare the density of the object to the densities of the liquids in the column

# Studying the Earth

# What does it mean to say that we must use “indirect observation” to know what the interior of the Earth is like?

-It means that we can’t actually see with our eyes what the inside of the Earth is like, we can’t go there.

Instead, we have to use methods that tell us what it is like without directly observing it.

# Name at least two things that help scientists infer what the interior of the Earth is like.

-Volcanoes

-Rock Samples

-The pattern of density

-Seismic wave patterns

# How can volcanoes help us know what the Earth’s interior is like?

Volcanoes can tell us what the materials below the crust are like.

# Name three things that increase as you travel toward the center of the Earth.

Temperature, pressure, and density

#  Earth’s Layers

1. What are the sevem layers of the earth from least dense to most dense?

Atmosphere, crust, lithosphere, asthenosphere, mantle, outer core, inner core

# Which layers of the earth are completely solid?

Crust, mantle (lower), inner core

# Which specific layer of the Earth is plastic?

Asthenosphere

# Which layer of the Earth is liquid?

Outer core

# Why is the outer core a liquid?

It’s HOT! THE temperature.

# Why is the inner core solid even though it is the hottest?

Too much pressure to flow so it stays a solid even though at that temp it should be a liquid

# Why is the core of the earth made of iron and nickel and not materials like aluminum and silicon?

Iron and nickel sank to the center when the Earth was forming because those materials are so dense

# Why is the bottom of the mantle solid and not plastic?

Pressure keeps the lower mantle from flowing, it keeps it a solid

# What does it mean to say that a layer of the earth is plastic?

It means it is a solid that can flow very slowly

# Which layer of the Earth is thickest? Thinnest?

Thickest = mantle, thinnest = crust

# If the Earth has mountains, canyons, hills, etc. why does it appear so round from outer space?

Because even though they seem huge to us, those things are just tiny little bumps compared to the size of the Earth.