

O.G.T. SCIENCE TEST: *QUICK STUDY GUIDE*

PLATE TECTONICS

The Earth's outer layer is broken up into 7 **lithospheric plates**. This is sometimes referred to as the CRUST.

The plates move due to convection currents inside the ASTHENOSPHERE or MANTLE.

When the plates move, many things can happen including **volcano eruptions, earthquakes, mountain building, seafloor spreading**, etc.

ATOMS

protons = positive charge, found inside the nucleus

electrons = negative charge, found in the "electron cloud" (surround the nucleus)

neutrons = neutral charge, found inside the nucleus

THE PERIODIC TABLE

The **atomic number** is equal to the **number of protons**. The *number of protons is equal to the number of electrons* in a neutral atom.

The **atomic mass** is equal to the **number of protons plus the number of neutrons**.

The **group number** (found at the top of each column) is equal to the **number of valence electrons**. *This is used when drawing electron dot structures.*

POTENTIAL ENERGY VS. KINETIC ENERGY

potential energy – an object's stored energy

Objects that are higher up or have more mass have a higher potential energy.

kinetic energy – an object's energy while in motion

DENSITY

density = mass/volume

Objects or substances that are **MORE** dense **SINK**.

Objects or substances that are **LESS** dense **RISE**.

NEWTON'S LAWS OF MOTION & GRAVITY

Newton's 1st Law: an object in motion stays in motion and an object at rest stays at rest

Newton's 2nd Law: $F = ma$

Newton's 3rd Law: for every action there is an equal and opposite reaction

Gravity: Under ideal conditions, objects fall to the ground at the same rate.

FOOD WEBS & ENERGY PYRAMIDS

FOOD WEBS show the **feeding relationships between plants and animals in an ecosystem**. *Arrows* show the relationships. They show the direction of energy transfer.

ENERGY PYRAMIDS show the **relative amounts of energy at each trophic level**. The amount of energy is greatest at the bottom of the pyramid and lowest at the top of the pyramid.

PYRAMID OF NUMBERS shows the **relative number of individuals at each trophic level**.

trophic level – each step in a food web or pyramid

SCIENTIFIC INQUIRY

Observations are made by gathering information about events or processes. An **inference is a logical interpretation** based on prior knowledge or experience.

A **hypothesis is a proposed scientific explanation** for a set of observations.

The variable that is **deliberately changed is called the manipulated variable**. The variable that is observed and **changes in response to the manipulated variable is called the responding variable**. *A control group is not exposed to the independent variable* so that it can be used as comparison to the experimental data.

LAST MINUTE NOTES:

ENERGY TRANSFER

Energy cannot be created or destroyed. It can only be transferred from one form to another (i.e. electrical to mechanical).

Heat energy ALWAYS travels from **hot to cold**.

CELLS

prokaryotes = simple cells; example: bacteria

eukaryotes = complex cells; includes plants, animals, protists and fungi

CELLULAR ORGANELLES

Prokaryotes contain genetic material not contained in a nucleus.

Eukaryotes contain complex organelles including a nucleus containing genetic material.

Plant cells contain a cell wall and chloroplasts. Animal cells do not.

CELLULAR PROCESSES

photosynthesis – process in which plants and other organisms use light energy to convert water and carbon dioxide into carbon dioxide

cellular respiration – process that releases energy by breaking down glucose and other food molecules in the presence of oxygen

GENETICS

Genes come in pairs of CHROMOSOMES (half come from your mom and half come from your dad).

The different varieties of genes are called alleles. **Alleles can be dominant or recessive.** If the dominant allele (represented by a CAPITAL letter) is present, it will always have “control.” A recessive allele (represented by a lowercase letter) will only be recognized if it is paired with another recessive allele.

HOMOZYGOUS PAIRS can be 2 dominant alleles (EE) paired together or 2 recessive alleles (ee) paired together. A **HETEROZYGOUS PAIR** is one dominant allele and one recessive allele (Ee).

GENOTYPE is the genetic make-up of an individual. **PHENOTYPE** is an individual’s physical appearance.

PUNNETT SQUARES are useful for finding the probabilities of traits being expressed in potential offspring. A **PEDIGREE** goes further by tracking the transmission of traits among various generations.

COMMUNITY INTERACTIONS

Competition – occurs when organisms attempt to use the same resource at the same place at the same time

Predation – an interaction in which one organism captures and feeds on another organism

Symbiosis – any relationship in which two species live closely together

Mutualism – a type of symbiosis in which both species benefit from the relationship

Commensalism – a type of symbiosis in which one organism benefits and other is neither helped nor harmed

Parasitism – a type of symbiosis in which one organism lives on or inside the other organism and harms it

SCIENCE BUZZWORDS

BIAS...unfair prejudice towards a particular opinion

ETHICS...a set of principles that guide decision-making

QUALITATIVE...data that uses nonnumeric descriptions

QUANTITATIVE...data that can be counted or measured

ABIOTIC & BIOTIC FACTORS

abiotic factor – something that is **not and has never been alive**, *examples: a rock in the forest, the water in a stream, a weather system*

biotic factor – things that are or used to be **alive**, *examples: a redwood tree, a rotting tree stump, a decaying squirrel*