**OGT SCIENCE QUICK STUDY GUIDE: Fall 2012**

**CELLULAR ORGANELLES**

**Nucleus**-brain of cell, contains genetic material (DNA) and chromosomes

**Mitochondria**-respiration occurs; makes energy

**Cell membrane**-“skin” of cell, encloses cell and food/wastes

pass through

**Flagella**-like a tail, used for movement (cilia are little hairs used for movement)

**Plant cells contain cell wall and chloroplasts** animal cell don’t

**Chloroplasts**-where plant cells use chlorophyll to do photosynthesis

**FOOD WEBS & ENERGY PYRAMIDS**

**Food Webs** look like a spider web, show **feeding relationships between plants and animals in an ecosystem.** Arrows in web show direction of energy transfer.

**Energy Pyramids** show relative **amounts of energy at each trophic level.** Energy greatest at bottom, lowest at top.

**Producers/Autotrophs**-make their own food (plants, algae)

**Consumers**-depend on other organisms for their food

**ECOSYSTEMS**

**Biome**-geographic region with a distinct climate and average temperature (desert, rainforest)

**Ecosystem**-made up of biotic and abiotic; (all living and non-living factors in a pond)

**Community**-all of the populations that live and interact in same area (all of plants and animals of forest)

**Population**-group of interacting individuals of same species

within same geographic area ( grove of apple trees)

**COMMUNITY INTERACTIONS**

**Competition**-when organisms compete for the same resources at same place, same time

**Predation**-interaction in which one organism captures and feeds

on another organism

**Symbiosis**-any relationship in which two species live closely together

**Mutualism**-type of symbiosis, both species *mutually* benefit

**Commensalism**-type of symbiosis, *one* organism benefits, other is neither helped nor harmed

**Parasitism**-type of symbiosis, one organism lives on or inside other organisms and harms it (flea and dog)

**CELLULAR PROCESSES**

**Photosynthesis**-process in which a plant uses light to convert carbon dioxide and water into food/energy

**Cellular respiration**-process releases energy by using oxygen to break down sugar (glucose) and other food molecules into food/energy

**SCIENTIFIC INQUIRY**

**Observations are made by gathering information using *your* senses** about events or processes.

**Inference is a guess** based off your prior knowledge or experience

**Independent variable/Manipulated variable** is the variable deliberately changed.

**Dependent variable/Responding variable** is the variable being observed and changes in response to the independent/manipulated variable

**Control Group** is **not** exposed to the independent/manipulated variable **so that it can be used as a comparison** to the experimental data

**Only one independent/manipulated variable** should be used in an experiment

**CELLS**

**Prokaryotes**-*simple* cells, no nucleus (bacteria)

**Eukaryotes**-*complex* cells with a

nucleus (plants, animals, humans, protists, fungi)

**ABIOTIC & BIOTIC FACTORS**

**Abiotic**-not and never been alive (rock, water in a river)

**Biotic**-things that are or used to be alive (tree, rotting tree stump)

**SCIENCE *BUZZ*WORDS**

**Bias**-unfair prejudice toward an opinion

**Ethics**-set of principles guiding decision-making; whether something

Is morally right or wrong

**Qualitative**-data that does not use numbers

**Quantitative**-data that uses numbers

**PREFIXES/SUFFIXES TO KNOW**

**bio**-life **thermo**-heat/temperature

**geo**-earth **eco**-environment/outdoors

**hetero**-different **chemo**-chemical

**homo**-same **photo**-light

**a**-not **synthesis**-creates

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**ENERGY TRANSFER**

Energy **cannot** be created or destroyed. It can **only** be transferred from one form to another.

Types of energy:

Thermal-heat

Mechanical-movement (pedaling a bike)

Chemical-chemical reactions (food in your body)

Electrical-electricity

Radiant-like light waves traveling through the air (from

sun to your eyes)

**PLATE TECTONICS**

**7 Plates**-Earth’s outer layer consists of this. Often called *Crust*

**Plates move due to convection currents** inside the mantle

**Volcano eruptions, earthquakes, mountain building, seafloor spreading** can occur when *plates move*

**GENETICS**

**Genes come in pairs of CHROMOSOMES.** The different varieties of genes are alleles. **Alleles can be dominant or recessive.** If the dominant allele (represented by a CAPITAL letter) is present, it will always have “control.” 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.

**Heterozygous pairs** is one dominant allele and one recessive allele (Ee)

**Genotype**: genetic makeup of individual (EE or Ee). (Genotype is the genetic material **YOU have** from your parents)

**Phenotype**-individual’s physical appearance

(Phenotype is how those genes are **EXPRESSED**). \***Examples include features like**: eye color, hair color, height etc. Phenotype is what you see when you look at yourself in the mirror, or when you look at a others)

**Punnett Squares**-useful in finding probabilities of traits being expressed

**DENSITY**

Density = mass/volume

Substances that are **MORE** dense **SINK**

Substances that are **LESS** dense **RISE**

**Example:** salad dressing made with oil & vinegar. You see two distinct layers. More dense substance will be on the bottom, less dense item will float to the top.

**NEWTON’S LAWS OF MOTION & GRAVITY**

**1ST Law** – an object in motions stays in motion

and an object at rest stays at rest

**2nd Law** – a force causes an object to accelerate; F (force) = ma (mass multiplied by acceleration)

The mass of the bowling ball multiplied by how fast the ball is rolling determines how great the force is that hits the pins.

**3rd Law** – for *every* action there is an equal and opposite reaction (when the bowling ball rolls down the lane this is action, when it hits the pins is the reaction)

**POTENTIAL ENERGY VS. KINETIC ENERGY**

**Potential energy** – an object’s ***stored***energy (rock atop a cliff)

**Kinetic energy** – an object’s energy ***while in motion*** (rock falling

off cliff)

**PERIODIC TABLE**

**Atomic Number** is equal to number of protons. The # of protons equal to # of electrons in a neutral atom

**Atomic Mass** is equal to **# of protons plus # of neutrons**

**ATOMS**

**Protons** = positive charge

found inside nucleus

**Electrons** = negative charge

outside nucleus

**Neutrons** = neutral charge

found inside nucleus