OGT Review Packet

Name _____ Period _____

OGT Power Standard

Cell Biology

Explain that cells are the basic unit of life, describe the structure and functions of cells, and explain the processes that take place within the cell.

Vocabulary

- Cell Types
  - Prokaryotic Cell
  - Eukaryotic Cell
- Cell Transport
  - Active Transport
    - Exocytosis
    - Endocytosis
    - Sodium Potassium pump
  - Passive Transport
    - Diffusion
      - Equilibrium
    - Osmosis
    - Ion channel
    - Facilitated diffusion
    - Hypotonic
      - Cytolysis
    - Hypertonic
      - Plasmolysis
    - Isotonic
- Cell Division
  - Diploid
  - Haploid
  - Meiosis
    - Spermatogenesis
    - Gamete
    - Tetrad
      - Homologous Chromosome
      - Crossing Over
  - Interphase
  - Mitosis
    - Prophase
    - Metaphase
    - Anaphase
    - Telophase
    - Cytokinesis
  - Sexual Reproduction
  - Asexual Reproduction
  - Binary Fission
  - Sex Chromosome
- Cell Energy
  - Photosynthesis
    - Light reaction
    - Dark reaction – Calvin Cycle
  - Cellular Respiration
    - Aerobic Respiration
      - Glycolysis
      - Krebs Cycle
      - Electron transport chain
    - Fermentation
- Cell Parts
  - Organelle
    - Microfilament
    - Flagellum
    - Golgi Body
    - Endoplasmic reticulum
    - Cilia
    - Lysosome
    - Mitochondrion
    - Ribosome
    - Vacuole
    - Cell Membrane
    - Cell Plate
    - Cell Wall
    - Centriole
    - Centromere
  - Plastid
    - Chloroplast
    - Chlorophyll
  - Nucleus
    - Nucleolus
    - Chromatid
    - Chromosome
    - DNA
- Cell Concepts
  - Cell Differentiation
  - Cell Theory
  - Homeostasis

Cell Biology Review Questions

1. Draw a picture of a plant and animal cell. Label parts and give their functions.

2. Name two parts of plant cells that are not found in animal cells.

3. Make a table recording the reactants and products of photosynthesis and cellular respiration.

4. Explain two difference between meiosis and mitosis.

1.

2.

5. Name one difference between a prokaryote and eukaryote.

6. Draw the 4 phases of mitosis.

DNA & Heredity

Explain the genetic mechanism and basis for inheritance.

Vocabulary

Medelian Genetics
- Inheritance
- Punnett Squares

DNA
- mutation

Alleles

Gene
- trait
- codominance
- Dominant trait
- recessive trait
- homozygous
- heterozygous/hybrid

genotype

phenotype

haploid

diploid

asexual reproduction

sexual reproduction

genetic variation

body cell

sex cell

replication

protein synthesis
- transcription
- translation
  - codon

mitosis

meiosis
- segregation
- jumping gene

DNA and Heredity Questions

1. If allele for tallness is represented by the letter “t” and “T” is dominant and “t” is recessive, write the phenotype and genotype for the following.
   a. Heterozygous _____
   b. Homozygous Dominant _____
   c. Homozygous recessive _____

2. Draw a Punnett Square for a cross between an individual that is homozygous dominant and heterozygous. What are the phenotypic and genotypic ratios of the offsprings?

3. Give a basic explanation of how the processes of transcription and translation make proteins from DNA.

4. When does DNA replication take place?

5. Give two examples of sex cells/ gametes.

Energy Flow through an Ecosystem

Explain the flow of energy and the cycling of matter through an ecosystem.

Vocabulary

abiotic factors
biotic factors
Ecology
- Biosphere
- Ecosystem
- Community
- Population

Elemental Cycles
- carbon cycle
- nitrogen cycle
  - Ammonification
- water cycle

Organism Relationships
- competition
- mutualism
- commensalism

Organism Roles
- Carnivore
- herbivore
- detritivore
- decomposition
- omnivore
- predator
- prey
- parasite

biodiversity
biomass

immigration
emigration

food chain
food web

dormancy
migration

species richness
species area effect

Ecosystem Questions

1. List 3 biotic and abiotic factors.

1.	1.
2.	2.
3.	3.

2. Explain the difference between a food chain and a food web.

3. What is the difference between an omnivore and a detritivore.

4. Explain the difference between the ecosystem level and the community level of ecology.

5. Explain the difference between species richness and population density.

Interdependence of Organisms

Explain the structure and function of ecosystems and how the change over time.

Vocabulary

- Organizing Organisms
  - dichotomous key
  - phylogenic tree
  - cladograms
- Population Growth
  - birth rate
  - age structure
  - death rate
  - exponential growth
    - carrying capacity
    - limiting factor
  - growth rate
  - survivorship curve
  - population density
- oceanic zone
  - aphotic zone
  - bethnic zone
  - neritic zone
  - palegic zone
- Kingdoms
  - Animalia
    - Genus
    - Species
  - Plantae
  - Fungi
  - Protista
  - Archaebacteria and Eubacteria
- virus
- Acclimation
  - tolerance curve
- succession
  - primary succession
  - secondary succession
  - pioneer series
  - climax community
- trophic level
- Biomes

Interdependence of Organisms Questions

1. Tell whether each kingdom is prokaryotic, eukaryotic or both, and whether they are unicellular, multicellular or both.

2. Draw an exponential and a logistic growth curve. On the logistic growth curve draw a line where the carrying capacity would be.

3. Explain the difference between the primary succession and secondary succession.

6. List the seven major biomes and give characteristics of each (temperature and precipitation)

4. Explain the concept of a trophic level. Which organisms would be on the first level?

5. Why are viruses not considered living organisms?

Evolutionary Theory

Explain the scientific mechanisms of evolution and describe how these theories contribute to an understanding of the unity and diversity of life.

Vocabulary

speciation
fossils
Darwin
    natural selection
Lamarck

Adaptation
    adaptive radiation

allele frequency
gene frequency
gene flow
genetic drift

bell curve
Hardy-Weinburg Principle

phylogenic tree
cladograms

co evolution

divergent evolution
convergent evolution

Prokaryotes
    Endosymbiosis
    Eukaryotes

mutation
    variation
    diversity

geographic isolation
sexual selection
directional selection

Analagous structures
Homologous structures
vestigial structure

genus - species

Evolutionary Theory Questions

1. Explain how the idea of natural selection can change gene frequencies.

2. Explain the difference between divergent and convergent evolution.

3. What is the difference between analogous and homologous structures?

4. How might a favorable mutation affect a gene frequency?

5. Explain the concept of genetic drift.

6. What is the difference between a cladogram and a phylogenic tree?

Structure of Matter

Explain that matter is made of minute particles called atoms and atoms are comprised of even smaller components. Explain the structure of an atom.

Vocabulary

periodic table
- atomic mass
- family
- group
- atomic number
- isotopes
- ions
- element
- valence electron
- electron cloud
- energy level

atom
- nucleus
  - proton
  - neutron
- electron

compounds
ionic bond
covalent bond
metallic bond

mixture

Alloy
metal
conductivity

alpha radiation

chemical equation
chemical properties

1. How many protons, neutrons, and electrons does a Carbon -12 ion have with a -1 charge?

2. What is the difference between a family and a group on the periodic table?

3. What is the difference between an isotope and an ion?

4. What is the difference ionic and covalent bonds?

5. Draw Fluorine with the correct number of valence electrons.

Properties of Matter

Differentiate between chemical and physical properties of matter and how the properties affect bonding.

Vocabulary

pH
- indicator
- Acids
- Bases

States of Matter
- Solid
- Liquid
- Gas
- plasma

chemical properties
- compound
  - inorganic compound
  - organic compound

physical properties
- mixture

law of conservation of mass and energy

crystal lattice

gas hydrocarbon

1. Draw as pH scale a put the following where you think they would belong: distilled water, soap, and lemon juice

2. Explain how compounds and mixtures are different.

3. Describe molecule movement in each of the 4 states of matter.

4. Define the law of conservation of mass and the law of conservation of energy.

5. Explain the difference between the terms organic and inorganic.

6. What ions do acids and bases make when put in water?

Energy

Describe different forms of energy. Explain how energy is not created nor destroyed. Explain how energy can be kinetic or potential.

Vocabulary

Matter
Mass
    density
Temperature
    Absolute zero
    Fahrenheit
    Celsius
    Kelvin
Types of Energy Transfer
    conduction
    convection
    radiation

Types of Energy
    electrical energy
    nuclear energy
    potential energy
    thermal energy
    mechanical energy
    chemical energy
    kinetic energy
Types of Chemical Reactions
    endothermic
    exothermic
Joule
Magnetism

1. Make a chart showing the differences in the types of energy transfer.

2. Explain the difference between exothermic and endothermic and give an example of each.

3. What happens to molecules at absolute zero?

4. Explain the difference between potential and kinetic energy.

5. Give an example of mechanical energy.

6. What are the boiling and freezing points of water on the Fahrenheit and Celsius scales?

Waves

Demonstrate that waves have energy and transfer that energy from one point to another.

Vocabulary

Waves
- Amplitude
- wavelength
- crest
- trough
- Period
- frequency

Waves Changing
- reflection
- refraction
- diffraction
- compression
- angle of incidence
- angle of reflection
- rare faction

Types of Waves
- electromagnetic waves
- transverse wave
- longitudinal wave
- lambda

constructive interference

destructive intererence

laser

light

Waves Review Questions

1. Explain the differences between reflection, refraction, and diffraction.

2. Draw a wave and label each of the following parts: wavelength, crest, trough, period, amplitude

3. Explain the difference between constructive and destructive interference.

4. What is the difference between a longitudinal and transverse wave?

5. Explain the angle of reflection and the angle of incidence.

6. What is a rarefaction?

Force and Motion

Explain the motion of an object using Newton's three laws of motion.

Vocabulary

Force
- Joule
- net force
- work
- motion
- gravity
  - weight

Affects of Forces
- Speed
- velocity
- terminal velocity
- momentum
- friction
- Acceleration

Collisions
- elastic collision
- inelastic collision

air drag

mass

power

Force and Motion Review Questions

1. Explain terminal velocity.

2. Explain the difference between mass and gravity.

3. What is the difference between an elastic collision and an inelastic collision?

4. Define force.

5. What is the difference between speed and velocity?

6. What two factors are involved how much friction is between two surfaces?

7. What two factors determine a objects momentum?

Scientific Inquiry

Participate in and apply the processes of scientific investigation to create and to design, conduct, evaluate, and communicate the results of these investigations.

Vocabulary

- The Scientific Method
  - Ask a Question/ observation
  - Research the Question
  - Hypothesis
  - Experimentation
    - Control
    - Variable
    - dependant variable
    - independent variable
    - Measurement
    - Data
  - Analyze
  - Conclusion
    - inference
    - theory
    - summary
  - Retest or Reformulate Hypothesis
- Ethics
  - negligence
  - Bias
  - fraud
  - objective
- Repeatability

1. Describe a scenario where negligence in the laboratory would lead to improper data.

2. Explain in your own words the idea of bias.

3. Why is it important that experiments are repeatable?

4. Define fraud.

5. Design an experiment using all of the steps of the scientific method. Label both dependant and independent variables. Also label the control.
   a. Question asked?

   b. Research – went to the library!

   c. Hypothesis

   d. Experimentation

   e. Results

   f. Conclusion

Scientific Ways of Knowing

Current Physical Science Issues

Trace the development of scientific theories and ideas and describe the emerging issues in the study of Physical Science.

Alternative Energy
- Wind Power
- Geothermal
- Solar
- Nuclear

Geologic Time
- C-14 Dating

Resource Depletion

Current Life Science Issues

Summarize the historical development of scientific theories and describe emerging issues in the life science field

Global Warming – CO_2 levels
- Ozone depletion - CFC's
- Cloning/Stem cell research

Air and Water Pollution

Population Growth

Genetic Engineering

Scientific Communication

Explain that scientific knowledge must be based on evidence, be predictive, logical, subject to modification and scrutiny, and driven by the needs of technology and society.

Graphs and Tables
- Pie Charts
- Observation vs. Inference
- Journals

Peer Review

Laboratory Reports

1. Explain the difference between ozone depletion and global warming.

2. Why is it important the scientists review other scientists work? (Hint: Why do I review your work?)

3. Explain one positive and negative to one of the following: Wind Power, Geothermal, or Solar Power

4. How could water pollution affect your local community?

5. What is one of the main reasons for resource depletion?

6. Explain how scientists use Carbon 14 dating.

Suggested Timelines???

Day 1:
Cell Bio Vocab
Cell Bio HW

Day 2:
Cell Bio Quiz
DNA and Heredity Vocab
DNA and Heredity HW

Day 3:
DNA and Heredity Quiz
Ecosystem Vocab
Ecosystem HW

Etc……

Day 1:
Cell Bio Quiz
Cell Bio Vocab
Cell Bio HW

Day 2:
DNA and Heredity Quiz
DNA and Heredity Vocab
DNA and Heredity HW

Day 3:
Ecosystem Quiz
Ecosystem HW
Ecosystem Vocab

Etc…..

Alternatives Day Ideas

Extended Response Day

Do extended response questions following these tips

NEVER move on to the next sentence until you understand the sentence you just read.
NUMBER all the parts of the question that require a Response. In addition, write these numbers in your response booklet.
RESTATE the Question!
NEVER use pronouns in your answer. (Words like It, Thing, or Stuff Don't Cut it!)
WRITE so someone can read it

Practice Test Day

- Use an old practice test
- Reserve the library and do an online test
- Create a practice test from quizzes from the review packet

Test Taking Day

- review tips for taking the test
- tips in binder

Review Frequently seen Questions

- Questions often seen
    i. A periodic table – atomic number, atomic mass, find neutrons and protons of an isotope
    ii. Density
    iii. The concept that plants intake CO_2 and release O_2 and animals intake O_2 and release CO_2.
    iv. Food chains and Food webs
    v. Biomes