Semester 1: Science 6 Study Guide Name: Guide - Key

Chapter 1: What is Science?

Lesson 1: The Skills of Science (pg 4-9)

- Science- way of learning about the natural world
- Observing- using senses to gather information
  - Quantitative- deals with numbers
  - Qualitative- Does not deal with numbers
- Inferring- explain or interpret what you observe
- Predicting- making statement about the future
- Classifying- group together like items
- Making Models- creating representation of complex things
  - Examples: map, solar system model, cells, car model, etc...
- Evaluating- comparing observations and data
  - Allow others to reproduce your experiment to see if your results are correct.

Lesson 2: Scientific Thinking (pg 10 – 17)

- Open to new changes and new experiments
  - If new data or knowledge is found
- Skepticism- attitude of doubt
- Persona Bias- Personal likes and dislikes affect thinking

  Example: you like milk, then everyone must like milk

- Cultural- culture affects way person thinks

  Example: milk only for babies so they won't drink as an adult

- Experimental- mistake in the design of experiment

  Example: No control group, etc...

- Objective Reasoning- base conclusions on evidence.
- Subjective Reasoning- allow personal feelings to make conclusions

Lesson 3: Answering Scientific Questions (pg. 18-27)

- Hypothesis- possible answer to a question
- Conducting Experiment
  - Variables- factors that change
  - Independent variables- variable purposely changed

Lesson 1: Measurement in Science (pg 38 - 47)

- Metric System
  - Convert: 100 cm = 1 meter 1000 km = 1 meter
- SI Units fill in chart → → → → →
  - Tool used to measure Length: meter stick
  - Tool used to measure Mass: Triple Beam Balance
    - ✓ Definition of Mass: amount of matter
    - ✓ Definition of Weight: force of gravity
  - Tool used to measure Volume: beaker/graduated cylinder
  - Density
    - ✓ Formula: D = mass/volume
    - ✓ The mass of a marble is 2g and has a volume of 4L. What is its density? 2g/4L = 1/2 g/L
    - ✓ Density describes if an object will float or sink <1 = float >1 = sink
  - Tool used to measure Temperature: thermometer
  - Tool used to measure Time: stopwatch

SI Prefixes		
Prefix	Symbol	Multiple
kilo-	k	1000
hecto-	h	100
deka-	da	10
deci	d	0.1
centi-	c	.01
milli-	m	0.001

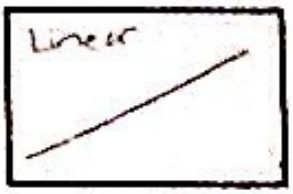
Lesson 2: Math in Science (pg. 48 - 55)

- Estimate- approximation of a number
- Accuracy- how close answer is to true/actual answer
- Precision- how close answer is to your other measurements.

- Significant figures
  - How precise measurements are.
  - How many significant figures does the following have?

1.) 231 3 2.) 3005 4 (sandwich rule) 3.)0.0034 2 4.) 25.34 + 9.7 = [illegible] 5.) 234 x 22 = [illegible]

- Percent Error
  - Formula = $\frac{|\text{Actual} - \text{Your}|}{\text{Actual}} \times 100\% =$
  - Find the percent error: the actual answer is 5.8 but you got an answer of 5.9. $\frac{5.9 - 5.8}{5.8} \times 100\%$
- Mean- the average of the data
  - Find the mean of the following numbers: 3, 7,4, 7,5 =
- Median- middle number
  - Find the median of the following numbers: 12, 17, 14, 22, 13
- Mode- appears the most
- Range- subtract the greatest number from the least number
- Anomalous Data- data that doesn't fit within a set



Lesson 3: Graphs (pg. 56 - 61)

- Bar graph, Circle graph
  - Line graph- draw an example of a linear and nonlinear graph→

Lesson 4: Using Models (pg. 62 - 71)

- Systems
  - Input- material that goes into the system
    - ✓ Example: Battery in flashlight
  - Process- what happens within a system
  - Output- energy that comes out of the system
    - ✓ Example: flashlight shines light
  - Feedback- output that changes a system
    - ✓ Example: eat → become full → stop eating

Lesson 5: Safety in the Science Laboratory (pg. 72 - 77)

- Safety Symbols
- Preparing for investigation- Helps keep you safe
  - Tie back long hair when working with fire
- Working in field- Wear appropriate clothing
- If accident occurs
  - Notify your teacher
  - Most important: Follow teacher's instructions
  - Carry out directions exactly

Chapter 8: Living Things and the Environment (pg. 274)

Lesson 1: Living Things and the Environment

- Habitat provides food, water, and shelter
- Abiotic Factor: Living things
  - ✓ 3 Examples: trees, animals, bacteria
- Biotic Factor: Nonliving things
  - ✓ 3 Examples: water, oxygen, dirt
- Ecosystem Organization
  - Organisms: consists of all the living
  - Populations: all members of a species
  - Communities: all the different populations
  - Ecosystems: all biotic and abiotic organisms
- Ecology: the study of the living & their environment

Lesson 2: Populations

- Population Size
  - Birth rate- amount being born
  - Death rate- amount of population decreased
  - If birth rate > death rate, population size increases
  - If death rate > birth rate, population size decreases

- Immigration: organisms move into a population
- Emigration: organisms move out of a population
- Population Density
  - Formula:

- Limiting Population Growth
  - Climate: too hot or too cold
  - Not enough space: Leads to less sunlight and water
  - Food and Water
  - Carrying Capacity: when reached the population stops increasing

Lesson 3: Interactions among Living Things

- Natural Selection- better suited organism's survive because they are better adapted.
- Adaptations-allow organisms to survive
  - ✓ Examples: camouflage, speed, poison, etc...
- Niche: the role of an organism
- Competition- struggle between animals to survive.
- Predation- one organism kills another organism for food or _____.
  - ✓ 3 Predator adaptations examples:
  - ✓ 3 Prey adaptations examples:
- Symbiosis
  - Mutualism- good for both organisms (+,+)
    - ✓ Example:
  - Commensalism- good for one organism, doesn't hurt the other (+,0)
    - ✓ Example:
  - Parasitism- good for one organism, harms other (+,-)
    - ✓ Parasite: organism that feeds on organism
    - ✓ Host: organism that the parasite lives on.
    - ✓ Example:

Lesson 4: Changes in Communities

- Succession: series of predictable changes that occur in a community
  - Primary Succession
    - ✓ Steps: 1 [illegible] 2 [illegible] 3 [illegible] 4 [illegible] 5 [illegible]

Chapter 9: Ecosystem and Biomes (pg. 310)

Lesson 1: Photosynthesis

- All energy comes from the Sun.
- *Photo* means. Light
- *Syntithenat* means: putting together
  - Producers- makes its own food
    - ✓ Example of Autotroph: plants/trees
  - Consumers- cannot make its own food
    - ✓ Example of Heterotroph. dogs, bear, etc...
- What happens during photosynthesis?
  - Stage 1:
    - ✓ Chlorophyll- the main pigment for photosynthesis.
- What's needed for photosynthesis- H_2O + sunlight + CO_2
- What's produced from photosynthesis- O_2 + Glucose (Sugar)

Lesson 2: Energy Flow in Ecosystems

- Energy Roles
  - Producers- make own food
    - ✓ Example:
  - Consumers: organism that eat producers or other consumers.
    - ✓ Herbivores- eat plants
      - a. Example: rabbit
    - ✓ Carnivores- eat meat
      - a. Example: wolf
    - ✓ Omnivores- eat both meat and plants
      - a Example: Bear
    - ✓ Scavenger- eat already dead organisms
      - a Example: hawk
  - Decomposers gets energy by breaking down dead organisms.
    - ✓ Example: mushroom, mold, etc..
- Energy Movement
  - Food Chains Example: plant → consumer → consumer
  - Food Webs Example:

  - Energy Pyramid: Animals use energy for growth and movement.
    - ✓ Animals with the most energy are located at the bottom of the pyramid
    - ✓ Animals with the least amount of energy are located at the top.

Lesson 3: Cycles of Matter

- Water Cycle
  - Cause of water cycle is Sunlight (heat).
  - Evaporation- liquid water turns to gas
  - Condensation- gas changes to liquid
  - Precipitation- heavy drops fall to earth
    Examples are rain, snow, sleet, and hail.
- Carbon and Oxygen Cycle
  - Description
- Nitrogen Cycle
  - Description
  - Nitrogen fixation- process of changing free nitrogen into a free form of nitrog

Chapter 6: Earth, Moon, and Sun

Lesson 1: The Sky from Earth

- Meteor- shooting star
- Comet – cold dust ice
- Constellation- stars form pics with stories.

Lesson 2: Earth in Space

- Rotation- causes days and nights
- Revolution- takes 365 1/4 days for the earth to revolve around the sun
- Day and night are caused by rotation.
- Seasons are caused by revolution + tilt of axis.

Lesson 3: Gravity and Motion

- Gravity is the attraction between two objects
- Gravity is affected by mass and length.
- Mass - amount of matter
- weight - force of gravity
- Gravity keeps Earth from flying off into space.
- Inertia keeps Earth moving in a circular pattern.