

Final Review – UNIT A: BIODIVERSITY

Experimental Variables

Manipulated –

Responding –

Controlled –

Vocabulary

Variation	Discrete variation	Gene
Ecosystem	Continuous variation	Allele
Biological Diversity	Asexual reproduction	Mitosis
Species	Binary fission	Meiosis
Population	Budding	Dominant trait
Symbiosis	Spore production	Recessive trait
Commensalism	Vegetative reproduction	Hybrid
Mutualism	Sexual reproduction	Incomplete dominance
Parasitism	Gametes	Extinction
Niche	Fertilization	Extirpation
Resource partitioning	Zygote	Clone
Generalist	Embryo	Artificial insemination
Specialist	Cross-fertilization	In vitro fertilization
Natural selection	DNA	Genetic engineering
Artificial selection	Chromosome	In-situ conservation

1. Give an example of each of the following:

Diversity within the same species	Diversity between different Species
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2. Describe symbiosis and give an example of each type

What is symbiosis? (pg 17)

Example of Mutualism:	Example of Commensalism.	Example of parasitism:
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3. Describe the niche of a black bear (apply your knowledge of a niche)

4. How can multiple bird species all live successfully in the same tree? How are their niches different? (pg 19)

5. Compare generalists and specialists (these are not in your textbook – look at the “niche” notes on our class website)
 - a) Do generalists have a **broad niche** or **narrow niche**? Explain.

 - b) Do specialists have a **broad niche** or **narrow niche**? Explain

6. Why is variation good for the survival of a species? (pg 20)

7. Compare heritable and non-heritable traits

List 5 examples of Heritable Traits.	List 5 examples of Non-Heritable Traits.
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8. Give three examples of continuous variation and 3 of discrete variation

9. Describe each of the following types of **asexual reproduction** (30-31)

- Binary Fission –
- Budding –
- Spore Production –
- Vegetative Reproduction –

10. Sexual reproduction

a. Describe or draw and label how sexual reproduction takes place in animals. Include the terms: egg, sperm, gametes, fertilization, zygote, and embryo (pg 32)

b. How does sexual reproduction take place in flowering plants? Include a labelled flower diagram. (pg 33)

11. What are the advantages and disadvantages of sexual reproduction and asexual reproduction? (pg 35)

Asexual Reproduction	
Advantages	Disadvantages

Sexual Reproduction	
Advantages	Disadvantages

12. What is the relationship between nucleus, chromosome, gene and DNA?
Describe, draw and label each (pg 40-45)

13. Complete the following table (Pg. 43)

Organism	Number of chromosomes in a body cell	Number of chromosomes in a gamete	Number of chromosomes in a zygote
Human			
Cat			
Dog			

14. Compare mitosis and meiosis. Include a brief sketch. (pgs 46-47)

Mitosis	Meiosis

15. Fill in each blank with either **mitosis or meiosis**.

- _____ happens in body cells
- _____ used to repair tissues like scrapes
- _____ 2 identical cells created
- _____ happens in sex cells/gametes to create more sex cells
- _____ 4 cells that are not identical are created

16. a) What would be the result of crossbreeding a purebred white female cat with a purebred black male cat if black fur is the dominant trait? (Pg. 50)

b) What would be the result of crossbreeding two hybrid black cats that have a litter of four kittens? (Pg 52)

c) draw the Punnett squares for each of the situations in a) and b) (this is not in your textbook – you may want to re-watch the video on our website)

17. If a white snapdragon flower and a red snapdragon flower are crossed, their offspring will likely be pink. What is this pattern of inheritance known as? (Pg. 53)

18. What is the difference between an extinct species and an extirpated species? Provide an example of each. (Pg. 58)

19. Identify and describe 3 human causes of extinctions and extirpations (Pg 61)

20. Identify each of the statements below as natural or artificial selection (pg 24, 66)
Then provide another example below.

_____ -the average beak size of a particular bird gets larger
because a larger beak is needed to eat the larger seeds that are available.

-another example would be:

_____ - dairy cows are bred to produce the maximum amount of
milk

-another example would be:

21. Describe and give an example of each form of biotechnology: (pg 67-69)

genetic engineering-

cloning-

artificial insemination-

in vitro fertilization-

22. The location in the world with the highest biodiversity is

23. Identify and describe 4 ways humans can conserve biodiversity (pg 72-76)

1.

2.

3.

4.

Name: _____

Final Review – UNIT B: MATTER AND CHEMICAL CHANGE

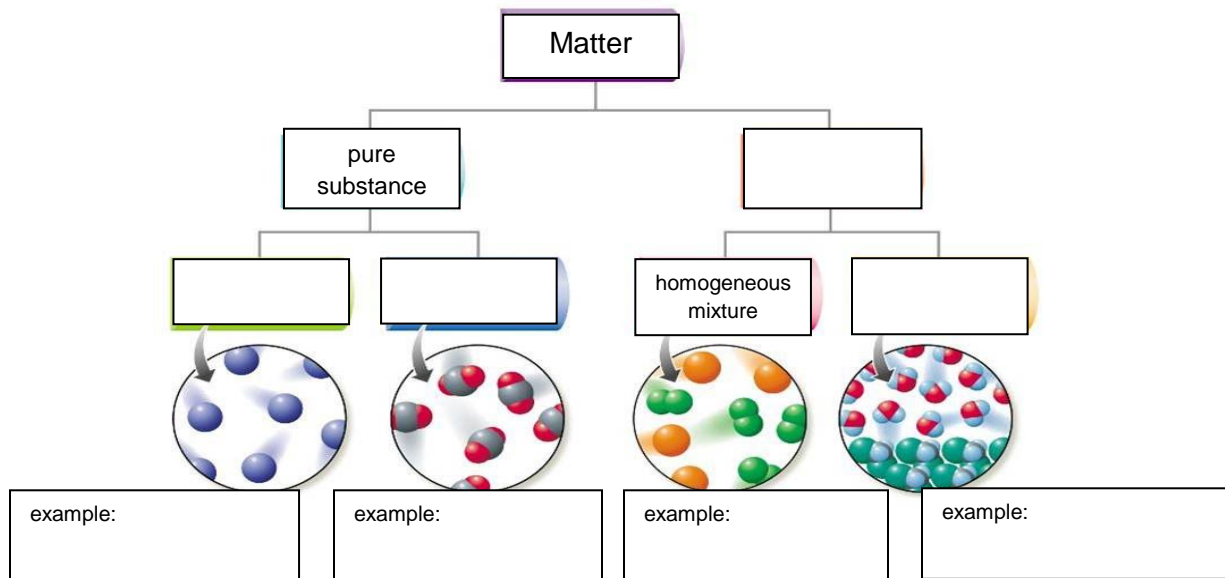
Vocabulary

WHMIS
Physical properties
Chemical properties
Physical change
Chemical change
Pure substance
Element
Compound
Mixture
Mechanical mixture
Solution
Atom
Electron

Proton
Neutron
Nucleus
Atomic number
Atomic mass
Alkali metals
Alkaline-Earth metals
Halogens
Noble gases
Ionic compound
Ion
Molecular compound
Conductivity

Reactants
Products
Exothermic
Endothermic
Combustion
Corrosion
Cellular respiration
Conservation of mass
Catalyst
Enzyme
Concentration

1. Complete the following chart.



2. What is a physical property? Chemical property? List some examples: (Pg. 98, 102)

physical property	chemical property

3. Give 3 examples of physical changes. List 4 signs that a chemical change occurred (Pg. 105)

Physical Change	Chemical Change

4. Briefly explain the atomic theories of each person below. Give the name of the model and draw a picture. (Pg. 118-120)

a) John Dalton

b) JJ Thomson

c) Ernest Rutherford

d) Niels Bohr

5. Explain the pattern Dmitri Mendeleev noticed as he was developing the periodic table (Pg. 124-125)

6. Identify the location and major characteristics of these chemical families (Pg. 133)

- alkali metals –

- alkaline Earth metals –

- halogens –
- noble gases –

7. Finding protons, neutrons, electrons (Pg. 128-129)

- What is the rule for finding the number of protons of an element?
- What is the rule for finding the number of electrons of an element?
- What is the rule for finding the number of neutrons of an element?

13	3+
Al	
Aluminum	
27.0	

8. Use a periodic table (Pg. 126) to complete the following chart:

Element Name Symbol # of protons # of electrons # of neutrons

Neon				
		9		
	C			
		11		
Chlorine				

9. Complete the following chart (Pg. 141-142)

Compound	Elements in compound	Number of atoms of each element	Drawing of compound
CaO			
CaCl₂			
Al₂O₃			
NaOH			

10. What are the properties of ionic and molecular compounds? (Pg 144, 150)

Ionic Compounds	Molecular Compounds

11. a.) What is an ion? (Pg. 146)

b) Compare an atom of fluorine to an ion of fluorine (apply your understanding of an ion)

12. Review the rules for scientific naming of compounds, described below. Then complete the table underneath. (Pg. 146, 152)

- **Step 1:** Identify if it is ionic or molecular compound (hint: is the first element a metal?)
- **Step 2:** Name first element. Name second element and change the ending to “-ide” (stop here if it is ionic)
- **Step 3:** If it is molecular, continue by adding prefixes onto both elements (ex, -mono, -di, -tri, -tetra). **The exception:** NEVER add -mono to the first element.

Chemical Formula	Type of compound (ionic or molecular?)	Chemical name
Li ₂ O		
SO ₃		
		calcium sulfide
NaF		
		diphosphorus trichloride
N ₂ O		

13. Recognize the common names of substances:

• H₂O

• Fe₂O₃

• NaCl

• C₆H₁₂O₆

14. Use the following chemical reaction to answer a)-d)



a) Is this a combustion or corrosion reaction? (Pg. 160)

b) Identify the products (Pg. 158)

c) Identify the reactants:

d) CH₄ is called methane. Write the word equation for this reaction

e) Is this reaction exothermic or endothermic? (Pg. 160)

f) If 24 g of methane react with 48 g of oxygen so that 41 g of water are produced, what mass of carbon dioxide is produced? (Pg 163)

15. List 4 ways we can speed up and slow down chemical reactions (Pg. 166-170)

Ways we can speed up a chemical reaction	Ways we can slow down a chemical reaction
1.	1.
2.	2.
3.	3.
4.	4.

16. What is the difference between combustion reactions and corrosion reactions? How are they similar? (Pg. 160)

Final Review – UNIT C: ENVIRONMENTAL CHEMISTRY

Vocabulary

Pollution	carbohydrates	Carbon dioxide
Fertilizer	lipids (fats)	Greenhouse gases
Pesticide	protein	Global warming
pH scale	substrate	Dispersion
acid	bioindicators	Dilution
base	ppm	Biodegradation
neutral	toxicity	Photolysis
neutralization	LD ₅₀	Phytoremediation
organic	sulfur dioxide	Permeable
inorganic	Nitrogen oxides	Impermeable
nutrients	Carbon monoxide	Leachate
micronutrients	Ozone	Biomagnification

1. Draw the pH scale below. Label where you would find acids, bases and neutral substances. Label examples of everyday items on the pH scale. (Pg. 191-193)

2. Complete the table below (Pg. 196-202)

	Function in the body	food sources	macronutrient or micronutrient?	organic or inorganic?
Protein				
carbohydrates				
lipids				
vitamins & minerals				

3. How is acid rain produced? (Pg 191)

4. Complete the following chart comparing the characteristics of high and low water quality (Pg. 214-220)

Characteristics	High Water Quality	Low Water Quality
Dissolved Oxygen (ppm)		
pH		
bioindicators		
levels of phosphates and nitrates		

5. What is pesticide resistance? (Pg. 221)

6. a) What is the LD₅₀ number? What does it stand for? (Pg. 221)

b) Drug X has an LD₅₀ of 6.3 mg/kg and Drug Y has an LD₅₀ of 630 mg/kg. Which drug is more toxic? Why?

c) If 200 rats are each given 6.3 mg/kg of Drug X, how many will die?

7. How can fertilizer be both helpful and harmful to the environment? (Pg. 186, 219)

8. What is a greenhouse gas? How do they contribute to global warming?(Pg. 229)

9. Describe the following ways to change the concentration of pollution (Pg. 243-247)

- dispersion:

- photolysis:

- dilution:

- biodegradation:

- phytoremediation:

10.What is chemical leaching in landfills? (Pg. 241)

11.What is the most important impermeable layer of a landfill that protects the environment from chemicals leaking out? (Pg. 241)

12.Why are harmful pesticides and other chemicals more concentrated at the top of the food chain? (Pg 248)

Final Review – UNIT D: ELECTRICITY

Vocabulary

Static electricity	Circuit breaker	Motor
Electrical discharge	Electrochemical cell	Electromagnet
Current	Dry cell	Commutator
Circuit	Wet cell	Armature
Amperes	Electrolyte	Electromagnetic
ammeter	Electrode	induction
Conductor	Electrolysis	Generator
Load	Resistor	Power
Voltage	Resistance	Efficiency
voltmeter	Ohm	Fossil fuel
Potential difference	Variable resistor	Nuclear energy
Insulator	Series circuit	Biomass
Short circuit	Parallel circuit	Renewable resource
Fuse	Energy	Non-renewable resource

1. Compare and contrast static electricity and current electricity (include descriptions and examples) (Pg. 274-275, 279)

STATIC ELECTRICITY	CURRENT ELECTRICITY

2. Laws of Electric Charges (Pg. 276)

- like charges _____

- unlike charges _____

3. Will a negatively charged object attract a neutrally charged object? _____

4. Compare conductors and insulators in the table below (Pg. 280, 298)

	CONDUCTORS	INSULATORS
role/purpose in a circuit		
examples		

5. Describe the role of each in a circuit, and provide an example (Pg. 279, 280)

- source:

- conductor:

- control:

- load:

6. Compare current, voltage, and resistance in the table below (Pg. 280-281, 300)

Quantity	Symbol	Definition	units & abbreviation
Current			
Voltage			
Resistance			

Formulae

$$V=IR$$

$$E=Pt$$

$$\text{Efficiency} = \frac{\text{Output energy}}{\text{Input energy}} \times 100\%$$

7. a) If a fluorescent light bulb uses 120 J of electrical energy and emits 23.4 J of energy in the form of light, what is the efficiency of the light bulb?

b) A circuit is built with a 9V battery and a light bulb. An ammeter attached in series reads 3.2 A. How much power does the bulb consume?

c) A TV is on for 5 hours. The input power rating of the TV is 220 W. How much energy is consumed by the TV?

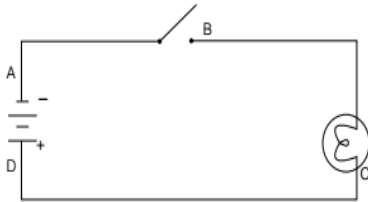
d) A light bulb is connected to four 1.5 V cells. An ammeter connected to the circuit reads 3.2 A. What is the resistance of the circuit?

8. Use the image below to compare a circuit to a waterfall (Pg. 305)

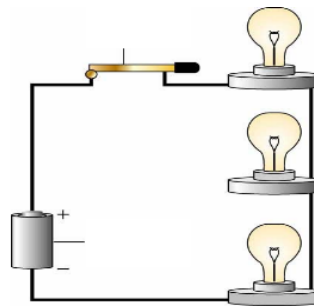


Quantity	Analogy to waterfall
Voltage	
Current	
Resistance	

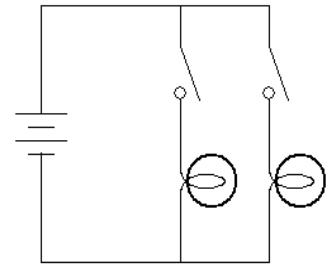
9. a) Label the parts of each of circuits W, X, and Y below. Indicate the direction of electron flow. Indicate if they are a series circuit or a parallel circuit. (Pg. 313)



W



X

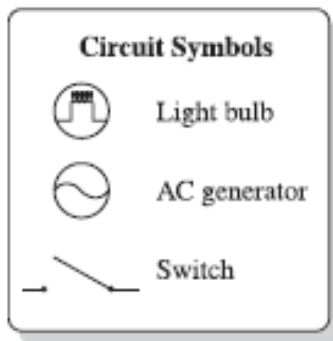


Y

10. a) Circuit A consists of two light bulbs connected in series and circuit B consists of two light bulbs wired in parallel. Which bulbs are brighter? Why? (Pg. 313)

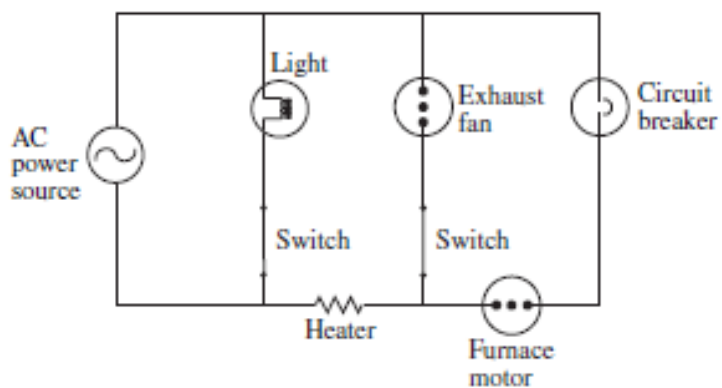
b) Compare the brightness of the bulbs for each circuit (W, X, and Y) in **Question 9**.

11. A garage is equipped with two lights and a generator, which are wired in parallel. Each light can be controlled separately, and there is a switch that can turn off both lights at once. Draw the circuit using the symbols shown below



12. Which component in the circuit below is protected by the circuit breaker?

Electrical Circuit of a Particular Garage



13. A dimmer switch allows a person to decrease or increase the brightness of a light bulb. How does a dimmer switch work? (Pg. 302)

14. Identify the energy conversions for each of the following devices (Pg. 321, 325, 331, 345-346)

-blender:

-motor:

-generator:

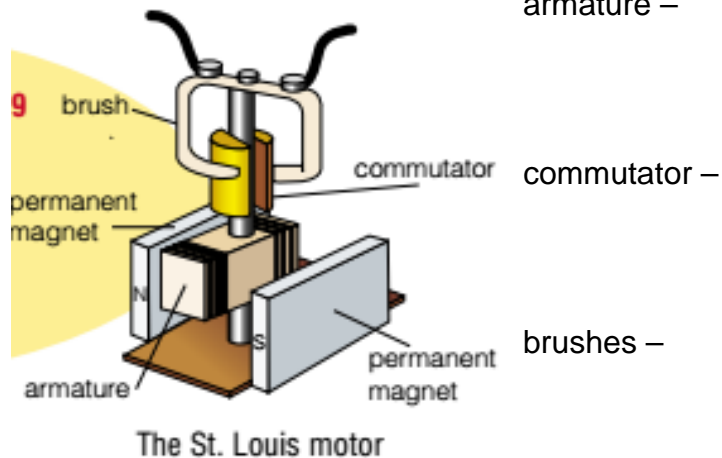
-windmill:

-hydroelectric dam:

-coal-fired power plant:

15. Draw and label a wet cell (Pg. 289)

16. Describe the purpose of each of the following parts of a motor: (Pg. 325)



17. How does an electromagnet work? What part of the motor above functions as an electromagnet? (Pg. 325)

18. What is electromagnetic induction? (Pg. 329)

19. Compare and contrast fuses and circuit breakers (Pg. 285-286)

- Fuses:

- Circuit Breakers:

20. Classify each as renewable or non-renewable: (Pg. 350)

_____ can be replenished	_____ Releases harmful
_____ generally creates	_____ CO ₂ emissions
_____ less air pollution	_____ Coal energy
_____ biomass	_____ Oil energy
_____ wind energy	_____ Gas energy
_____ hydroelectricity	

21. What are the advantages and disadvantages of each source of energy? (Pg 345-347)

Source of Energy	Advantages	Disadvantages
Wind		
Solar		
Hydro		
Biomass		
Nuclear		
Oil/Coal/Natural Gas		

Final Review – UNIT E: SPACE EXPLORATION

Vocabulary

geocentric model	reflecting telescope	parallax
heliocentric model	Hubble telescope	triangulation
ellipses	altitude	satellite
terrestrial planet	astrolabe	geosynchronous orbit
gaseous planet	azimuth	low-Earth orbit
star	zenith	probe
nebula	spectroscope	space shuttle
galaxy	spectral analysis	ISS
constellation	red/blue shift	microgravity
refracting telescope	light year	space junk

1. Compare and contrast the heliocentric and geocentric models of the solar system

2. Long ago, the shape of planetary orbits was believed to be _____,
but we now know the shape to be _____

3. **Imagine** that two new planets have been discovered. **Planet X** has been found between the orbits of Venus and Earth. **Planet Y** has been found between the orbits of Jupiter and Saturn. Complete the table below outlining the characteristics you'd expect each newly discovered planet to have.

Characteristic	Planet X	Planet Y
distance from the sun		
length of year (period of revolution/ orbit time)		
size		
strength of gravity		
composition		

4. Order from smallest to largest: solar system, galaxy, star, Saturn, Earth, universe, moon

10. How can parallax and triangulation be used to determine information about a star?
What information can be learned?

11. Compare and contrast Low Earth and Geosynchronous orbits for satellites. What are the main uses of each?

	Low Earth Orbit	Geosynchronous Orbit
Description		
Uses		

12. Identify and describe three different types of spacecraft. Describe the purpose of each.

1.

2.

3.

13. What are some of the risks, dangers, and problems associated with space exploration? What are some of the solutions?

14. What is space junk and how does it affect space exploration?