

End of Course Review

Review sheet

Biology I

Name: _____

Review Tips: Review ALL vocabulary, notes, assignments and worksheets

Holt Biology – CP: Review Science Skills on pages 1050 – 1063 and Lab safety on pages xxiv – xxvii

Modern Biology – H: Review Lab safety & Science Skills on pages 1066 – 1085

Unit 1 – Intro to Biology

- What is Biology?
- Scientific method
- Reading graphs & charts
- Lab safety & equipment
- Properties of life

Unit 2 - Ecology

- Ecosystems & Biomes
- Food webs, pyramids and succession
- Populations and communities
- Geochemical cycles
- Conservation issues & solutions

Unit 3 – The Cell

- History of cell biology
- Intro to the cell
- Cell organelles
- Plant vs. animal cell features
- Microscope

Unit 4 - Biochemistry

- Carbon compounds
- Molecules of life
- Energy & chemical reactions
- Water & solutions
- Acids & bases

Unit 5 – Cell Transport

- Homeostasis
- Passive transport
- Active transport

Unit 6 – Cell Energy

- Photosynthesis
- Cellular respiration
- Aerobic respiration
- Anaerobic respiration

Unit 7 – Cell Cycle

- Mitosis
- Sexual / Asexual reproduction
- Chromosomes / Genes
- Mutations
- DNA
- RNA
- Protein synthesis

Unit 8 – Meiosis & Heredity

- Meiosis
- Law of dominance
- Law of segregation
- Law of independent assortment
- Sex-linked traits
- Punnett squares
- Pedigrees

Unit 9 – Evolution & Classification

- Darwinian evolution
- Natural selection
- Microevolution
- Evidence of evolution
- Macroevolution
- Classification of life
- Dichotomous key
- Taxonomy

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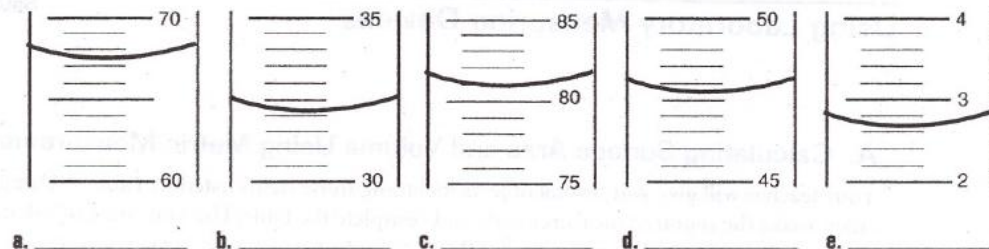
Unit 1 – Intro to Biology (CP Chapters 1-2+ / H Chapters 1-2+)

1. What is a hypothesis? (CP10 / H13)
2. Why should sources of scientific information be credible, accurate, and relevant? (Class Notes)
Credible –
Accuracy –
Reliable –
3. Use the laboratory tools below to record the **METRIC** unit indicated. (CP1058 / H23 Class Notes)

What lengths are indicated on this ruler?



What volume is indicated on each of these graduated cylinders?



Use this space to record the lengths:

4. Your scientific work should be done with precision and accuracy. What does that mean? (Class Notes)
Precision –
Accuracy –
5. List and describe the steps of the scientific method. (CP10-12 / H13-17)

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6. Describe what an independent and dependent variable are in an experiment. (CP11 / H15-16)
Independent Variable –
Dependent Variable –
7. Determine the independent and dependent variable in the following statements. (CP11, 1060 / H15-16)
 - a. The higher the temperature of water, the faster an egg will cook.
I –
D –
 - b. Grass will grow taller if it is watered a great deal and if it is fertilized.
I –
D –
 - c. If the amount of calcium chloride added to water increases, the temperature of the water also increases.
I –
D –
8. What is the difference between the control group and the experimental group? (CP11 / H15)
Control group –
Experimental group –
9. What are the three basic types of graphs and what is require for each? (CP1060 / H16-17 Class Notes)
 - a.
 - b.
 - c.
10. What is the difference between direct and inverse variation? (Class Notes)
Direct Variation –
Inverse Variation –
11. Convert the following units (Class Notes / H1072)
467 meters is _____ mm 1.24 kg is _____ g 1,284 mL is _____ L
12. Compare and contrast scientific investigation and technological design. (CP1050-1053 / Class Notes)
Scientific Investigation –

Technological design -

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Unit 2 – Ecology (CP Chapters 4-6 / H Chapters 18-22)

1. Describe the trophic levels of a food chain. (CP86-87 / H368)
First Trophic Level -
Second Trophic Level -
Third and Fourth Trophic Levels -
2. Define the term & identify the different types of organisms at each level. (CP86-87 / H367 Class Notes)
Autotrophs (CP197 / H113) -
Heterotrophs (CP434 / H113) -
Herbivores (CP87 / H367) -
Carnivores (CP87 / H367) -
Predators (CP79, 115 / H399) -
Scavengers (Class Notes) -
Omnivores (CP87 / H367) -
Detritivore (CP86 / H367) -
3. How does the energy, number of organisms, and biomass change as you from one trophic level to the next? (CP86-89 / H369)

4. What is an ecosystem? (CP79 / H362)

5. How do predator and prey populations affect each other? (CP109-111 / H399)

6. Describe the symbiotic relationships: parasitism, mutualism, and commensalisms. (CP109-111 / H403)
Parasitism –
Mutualism -
Commensalism –

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7. What is a niche? What will happen if the niche of two species overlaps too much? (CP113 / H365, 401)

8. Define and give examples of density-dependent factors. (CP105 / H388)
Density-Dependent Factors -
9. Define and give examples of density-independent factors. (CP105 / H388)
Density-Independent Factors -
10. Define and give examples of biotic and abiotic factors. (CP79 / H363)
Biotic –
Abiotic –
11. Define and give examples of primary succession. (CP81 / H409)

12. Define and give examples of secondary succession. (CP81 / H409)

13. Describe how the following processes play a role in the Carbon Cycle. (CP91 / H372-373 Class Notes)
 - a. Photosynthesis -
 - b. Respiration -
 - c. Decomposition –

 - d. Conversion of biochemical compounds –

 - e. Combustion –

 - f. Weathering of rocks –

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14. Describe how the following processes play a role in the Nitrogen Cycle. (CP92 / H373-374)

- a. Nitrogen-fixation –

- b. Intake of nitrogen by organisms –

- c. Decomposition –

- d. Denitrification –

15. Describe how the following processes play a role in the Water Cycle. (CP90 / H371-372)

- a. Intake of water by organisms –

- b. Transpiration –

- c. Respiration –

- d. Elimination –

16. What is the greenhouse effect? (CP129 / H436)

17. Describe how the atmosphere, geosphere, and hydrosphere play a role in the biosphere. (Class Notes / H371-372, 436-437)

Atmosphere -

The hydrologic cycle -

Geosphere -

18. Describe how population growth, technology, and resource consumption play a role in the sustainability of our environment. (CP125 / H444)

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Unit 3 – The Cell (CP Chapters 7-8 / H Chapter 4)

1. What are the three parts of the cell theory? (CP152 / H70)
 - 1.
 - 2.
 - 3.
2. What is the difference between a prokaryotic cell and a eukaryotic cell? (CP154-155 / H75)

Prokaryotes -

Eukaryotes -
3. Be able to identify and describe the function of the following organelles.
 - a. Nucleus (CP157 / H74) -
 - b. Mitochondria (CP161 / H80) -
 - c. Chloroplasts (CP161 / H89) -
 - d. Lysosomes (CP158-159 / H82) -
 - e. Vacuoles (CP160 / H87) -
 - f. Ribosomes (CP157 / H80) -
 - g. Endoplasmic reticulum (smooth and rough) (CP158-159 / H81) -
 - Rough ER:
 - Smooth ER:
 - h. Golgi apparatus (CP158-159 / H82) –
 - i. Cilia (CP502-503 / H85) –
 - j. Flagella (CP162 / H85) -
 - k. Cell membrane (CP154 / H77) –
 - l. Nuclear membrane (CP157 / H79) –
 - m. Cell wall (CP154 / H88) -

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4. Which of the parts above are in an animal cell? Which are in a plant cell?

Organelle	Animal Cell	Plant Cell
Nucleus		
Mitochondria		
Chloroplast		
Lysosome		
Vacuole		
Ribosome		
ER		
Golgi Apparatus		
Cilia or Flagella		
Cell Membrane		
Nuclear Membrane		
Cell Wall		

5. Which of the parts above are in a prokaryotic cell? Which are in a eukaryotic cell?

Organelle	Prokaryotic Cell	Eukaryotic Cell
Nucleus		
Mitochondria		
Chloroplast		
Lysosome		
Vacuole		
Ribosome		
ER		
Golgi Apparatus		
Cilia or Flagella		
Cell Membrane		
Nuclear Membrane		
Cell Wall		

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6. What cell differentiation? What kind of cells can go through this? (CP166 / H160, 223, 652)

Unit 4 – Biochemistry (CP Chapters 3, 36 / H Chapters 2-3)

1. Describe how temperature, pH, and catalysts affect chemical reactions. (CP66 / H36, 57)

Temperature –

pH –

Catalysts –

2. What is activation energy? (CP65 / H36)

3. What are enzymes and how can they affect chemical reactions? (CP66 / H57)

4. Describe the following for Proteins. (CP62, 177, 892 / H56 Class Notes)

a. Elements of which they are composed

b. Building blocks

i. 12

ii. 8

c. Functions

Contractile proteins -

Hormone proteins -

Enzymatic proteins -

Structural proteins -

Transport proteins -

d. Food Sources

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5. Describe the following for Carbohydrates. (CP60, 892 / H55-57 Class Notes)

a. Elements of which they are composed

b. Structure/Types

Monosaccharides –

G_____

Disaccharides –

S_____

Polysaccharides –

A_____

C_____

c. Functions

1.

2.

3.

d. Food Sources

6. Describe the following for Lipids. (CP61, 892 / H59-60 Class Notes)

a. Elements of which they are composed

b. Structure

c. Functions

1.

2.

3.

d. Food Sources

7. Describe the following for Nucleic Acids. (CP63, 296, 892 / H60 Class Notes)

a. Elements of which they are composed

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b. Structure

i.

ii.

iii.

c. Functions

d. Examples

i.

ii.

Unit 5 – Cell Transport (CP Chapter 8 / H Chapter 5)

1. What is homeostasis? (CP19, 175 / H8)
2. Why do we call the cell membrane semi-permeable (or selectively permeable)? (CP176 / H77)
3. List and describe the three types of passive transport. Why are they called “passive”? (CP178-181 / H97-101)
 1. D _____
 2. O _____
 2. F _____
4. List and describe the three types of active transport. Why are they called “active”? (CP182-183 / H103-106)
 1. P _____
 2. E _____
 3. E _____

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5. Describe the situation and what would happen to a cell in each of the following solutions. (CP180 / H98-99)
- a. Hypotonic

 - b. Hypertonic

 - c. Isotonic

Unit 6 – Cell Energy (CP Chapter 9 / H Chapters 6-7)

- 1. What is photosynthesis? (What is the goal? Who can perform this process?) (CP197-198, 202-207 / H113)

- 2. What is the formula for photosynthesis? (CP199 / H114)

- 3. What happens during the light stages of photosynthesis? (CP204-205 / H116-118)

- 4. What happens during the dark stages of photosynthesis? (CP206-207 / H120-121)

- 5. What is cellular respiration? (What is the goal? Who can perform this process?) (CP208 / H131)

- 6. What is the formula for cellular respiration? (CP208 / H132)

- 7. What happens in each step of cellular respiration?
Glycolysis (CP208-209 / H132):
Krebs Cycle (Citric Acid Cycle) (CP210-211 / H138-139):
Electron Transport Chain (ETC) (CP212 / H139):

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8. What is fermentation and why would it occur? (CP212 / H133-140)

9. What are the two types of fermentation and what organisms can perform them? (CP212 / H134-135)

10. What is ATP? (What is it made of? What does it do? How does it release and store energy?)
ATP stands for _____ (CP200 / H54)

Unit 7 – Cell Cycle (CP Chapters 10, 13 / H Chapters 8, 10)

1. What are the phases of the Cell Cycle? (CP228-229 / H155)

2. What happens in each stage of Interphase? (CP228-229 / H155)
G1 –
S –
G2 –

3. What are the phases of Mitosis and what happens in each? (CP230-231 / H156-157)
Prophase
 -
 -
 -
 -
 -
 -Metaphase
 -
 -
 -
 -Anaphase

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-

Telophase

-

-

-

-

4. What happens during cytokinesis and how is it different in plants and animals? (CP232 / H157-158)

a. In animals:

b. In plants:

5. How does a cell control the cell cycle? (CP234 / H158-159)

6. What happens if a cell does not listen to the control signals and checkpoints? (CP235 / H159)

7. How are DNA, genes, and chromosomes related to one another? (CP235 / H159)

_____ → _____ → _____

8. Describe the structure of DNA. (CP296 / H197)

Each nucleotide has three parts:

a.

b.

c.

9. Describe DNA Replication. (CP300-303 / H200)

a.

b.

c.

d.

e.

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10. Describe the structure of RNA. Name its three parts.(CP305 / H205)

- a.
- b.
- c.
- i.

11. Describe the process of Transcription and the type of RNA involved. (CP304-307 / H206)

-
-
-
-
-

12. Describe the process of Translation and the types of RNA involved. (CP308-309 / H208-209)

-
-
-
-
-

13. How do the nitrogen bases differ between DNA and RNA? (CP305 / H205)

Unit 8 – Meiosis & Heredity (CP Chapter 11-12 / H Chapters 8, 10)

1. How many chromosomes do humans have? How many are autosomes? How many are sex chromosomes? (CP248-249 / H152-153)

2. How many chromosomes would a gamete have? (CP249, 257 / H153)

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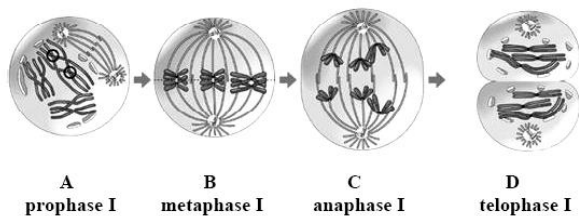
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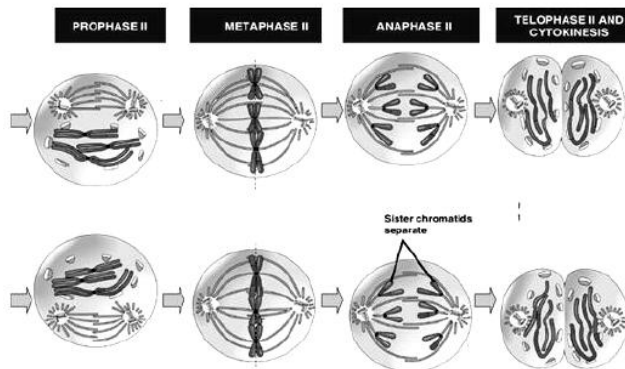
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3. List and describe what happens in the steps of Meiosis. (CP250 / H161)

Meiosis I



Meiosis II



Interphase –

Prophase I –

Metaphase I –

Anaphase I –

Telophase I –

Prophase II –

Metaphase II –

Anaphase II –

Telophase II –

4. What is crossing over and when does it occur? (CP253 / H162)

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5. What is the Law of Segregation? (CP273 / H177)

6. What is the Law of Independent Assortment? (CP254 / H177-178)

7. What is the difference between an organism's genotype and phenotype? (CP274 / H180)

Genotype –

Phenotype –

8. Black fur (B) is dominant to white fur (b) in rabbits. For the following crosses, show a Punnett square and the possible genotypes and phenotypes for their offspring. (CP277 / H182-183)

a. A heterozygous black rabbit with a white rabbit

Genotype: _____

Phenotype: _____

9. Black fur (B) is dominant to white fur (b) in rabbits. Long ears (L) are dominant over short ears (l). For the following crosses, show a Punnett square and the possible genotypes and phenotypes for their offspring. (CP275 / H185-186)

a. Two rabbits heterozygous for both fur color and ear length

Genotype:

Phenotype:

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b. A homozygous black fur, long eared rabbit with a white, short eared rabbit

Genotype:

Phenotype:

10. Hemophilia is a sex-linked trait. The trait for hemophilia is recessive (h) to the normal allele (H). For the following crosses, show a Punnett square and the possible genotypes and phenotypes for their offspring. (CP280 / H237)

a. A father with hemophilia crossed with a normal mother who is a carrier for the disease

Females: _____

Males: _____

b. A hemophiliac mother and a normal father

Females: _____

Males: _____

11. For the following crosses, show a Punnett square and the possible genotypes and phenotypes for their offspring. (Class Notes / H943)

a. A man with type O blood and a female with type AB

Phenotype: _____

b. A man with type B blood (whose mother is type O) and a woman with type AB

Phenotype: _____

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12. What does it mean if traits show incomplete dominance? Codominance? (CP282-283 / H184, 244)

Incomplete dominance –

Codominance –

13. How do you read a pedigree? What do the symbols mean? (CP280 / H241)

14. What is nondisjunction? What are some possible outcomes of nondisjunction? (CP324 / H239)

Unit 9 – Evolution & Classification (CP Chapter 16-19 / H Chapters 14-17)

1. What is biological evolution? (CP375 / H297)

2. What is adaptation and how does it play a role in the survival of a species? (CP381 / H12, 300)

3. What is meant by the phrase “survival of the fittest”? (Class Notes / H301)

4. Biological Evolution concepts:

a. Hardy-Weinberg Principle (CP405 / H320)

b. Speciation (CP387, 411-414 / H326)

c. Patterns of evolution

i. Gradualism (CP389 / H320)

ii. Punctuated equilibrium (CP389 / H320)

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- iii. Divergent evolution (Class Notes / H309)

- iv. Convergent evolution (CP388 / H309)

- v. Coevolution (CP388 / H310)

- vi. Extinction (CP414 / H322, 442)

- d. Anatomy
 - i. Homologous structures (CP384 / H305)

 - ii. Vestigial structures (Class Notes / H306)

- e. Embryology (CP383 / H306)

- f. Biochemistry – DNA similarities (CP384 / H306)

- g. Paleontology – fossil records (CP382 / H302-303)

- h. Phylogenetic Tree (CP428 / H307, 341)

- i. Classification (CP1062-1063 / H347-350)
 - i. Three Domains

 - ii. Six Kingdoms