June 13, 2019 4:35 PM

SCIENCE 9

FINAL EXAM REVIEW BOOK 4

CELLS ARE DERIVED FROM CELLS

NAME: Key BLOCK: _____

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Study Checklist

This review booklet is by no means a "practice final". It is a collection of practice questions on each unit, meant to guide your final exam studying and prepare you for the types of questions you are likely to see. DO NOT treat this booklet as a practice test. If you're stuck on a question, look it up and ask for help! DO NOT go straight to the answer key when you come across a question you cannot remember how to do. Difficult questions SHOULD guide your study! Always look up a concept in your class notes if you are stuck, then attempt the question again.

***BEFORE* beginning this booklet you should:**

- read through your class notes booklet on *each topic*
- make your own "quick summary page" of important formulas & key concepts for the unit
- review quizzes & tests from the unit to recall strengths & weaknesses *(a great study method would be to re-do old quizzes & tests on a separate piece of paper)*

***WHILE* working through this booklet you should:**

- look up concepts & example problems in your class notes when you come across a problem you are stuck on
- make a list of "questions to ask my teacher" so you can come to class and use your time efficiently.

Questions I'm having difficulty with:

Page	Question Number #	Topic

UNIT 4: BIOLOGY

use this page to make your own KEY summary notes

You should write your own summary notes here.

Make these as you re-read through each of your notes booklets.

This might be diagrams, or vocabulary definitions.

BIOLOGY STUDY GUIDE

Key Ideas:

- ~~How do you use a microscope?~~
- Why is the reproduction of cells important?
- What are different ways that living things reproduce asexually?
- How do living things reproduce sexually?
- What are the advantages and disadvantages of sexual and asexual reproduction?
- How does reproduction contribute to the variety of life on Earth?

Key Terms:

- ocular magnification
- objective magnification
- total magnification
- microscope parts (nosepiece, ocular lens, objective lens, stage, stage clips, diaphragm, light source, arm, base, coarse adjustment knob, fine adjustment knob)
- eukaryotic
- prokaryotic
- DNA
- nucleus
- nucleotide
- chromosome
- chromatin
- sister chromatid
- homologous chromosomes
- gene
- asexual reproduction
- sexual reproduction
- binary fission
- spore
- cell cycle
- mitosis
- interphase
- prophase
- metaphase
- anaphase
- telophase
- cytokinesis
- centromere
- spindle fibers
- centriole
- budding
- clone
- vegetative propagation(vegetative reproduction)
- daughter cells
- gamete
- somatic cell
- haploid
- diploid
- fertilization
- zygote
- meiosis
- embryo
- fetus
- genetic diversity/ genetic variation
- crossing over
- oogenesis
- egg
- spermatogenesis
- sperm

Concepts to Know:

Arrangement of DNA and Chromosomes
- □ Know the parts of a DNA
- □ Know that DNA makes chromatin; that chromatin makes chromosomes; that genes are found on chromosomes
- □ Understand that the genetic code is found in DNA, and how it is made into proteins
- □ Make the connection between DNA, chromatin, chromosomes, genes, and proteins
- □ Distinguish between sister chromatids and homologous chromosomes

Cell Cycle
- □ Know the stages of a cell cycle
- □ Know the difference between interphase and cell division

Cell Division: Mitosis and Cytokinesis
- □ Know the names of and processes involved in each phase of mitosis
- □ Understand the purpose of mitosis in asexual, unicellular, and multicellular organisms
- □ Know what type of cells are involved in mitosis
- □ Know what type of cell results from mitosis

Methods of Asexual Reproduction
- □ Distinguish between the 5 types of asexual reproduction (binary fission, budding, spore formation, fragmentation, and vegetative reproduction)
- □ Know examples of organisms that reproduce asexually through binary fission, budding, spore formation, fragmentation, and vegetative reproduction.
- □ Know the advantages and disadvantages of asexual reproduction

Cell Division: Meiosis
- □ Compare the difference between regular body cells and gametes
- □ Understand why haploid cells (as opposed to diploid cell) are required for fertilization
- □ Understand the consequences of using diploid cells during fertilization
- □ Know the names of and processes involved in each phase of meiosis
- □ Understand the purpose of meiosis in sexual multicellular organisms

Cell Division: Mitosis versus Meiosis
- □ Compare the phases of mitosis and meiosis
- □ Understand the difference between the purpose of mitosis and meiosis
- □ Understand the differences between the result of asexual and sexual reproduction

Sexual Reproduction
- □ Know the advantages and disadvantages of sexual reproduction
- □ Know the basic stages in human embryonic/fetal development

Genetic diversity
- □ Compare the genetic diversity of asexual and sexual reproduction

Cell Organelles

Complete the following table by writing the name of the cell part or organelle in the right hand column that matches the structure/function in the left hand column. A cell part **may** be used more than once.

Structure/Function	Cell Part
1. Stores material within the cell	vesicle (or vacuole)
2. Closely stacked, flattened sacs (plants only)	chloroplast
3. The sites of protein synthesis	ribosomes
4. Transports materials within the cell	vesicle
5. The region inside the cell except for the nucleus	cytoplasm
6. Organelle that manages or controls all the cell functions in a eukaryotic cell	nucleus
7. Contains chlorophyll, a green pigment that traps energy from sunlight and gives plants their green color	chloroplast
8. Digests excess or worn-out cell parts, food particles and invading viruses or bacteria	lysosome
9. Small bumps located on portions of the endoplasmic reticulum	ribosomes
10. Provides temporary storage of food, enzymes and waste products	vacuole
11. Firm, protective structure that gives the cell its shape in plants, fungi, most bacteria and some protests	cell wall
12. Produces a usable form of energy for the cell	mitochondria
13. Packages proteins for transport out of the cell	golgi body/apparatus
14. Everything inside the cell including the nucleus	organelles
15. Site where ribosomes are made	nucleolus
16. The membrane surrounding the cell	cell membrane
17. Provides support for the cell, has two "subparts"	cytoskeleton
18. Name for the collection of DNA in the nucleus of eukaryotic cells	chromosomes
19. Consist of hollow tubes which provide support for the cell	centrioles

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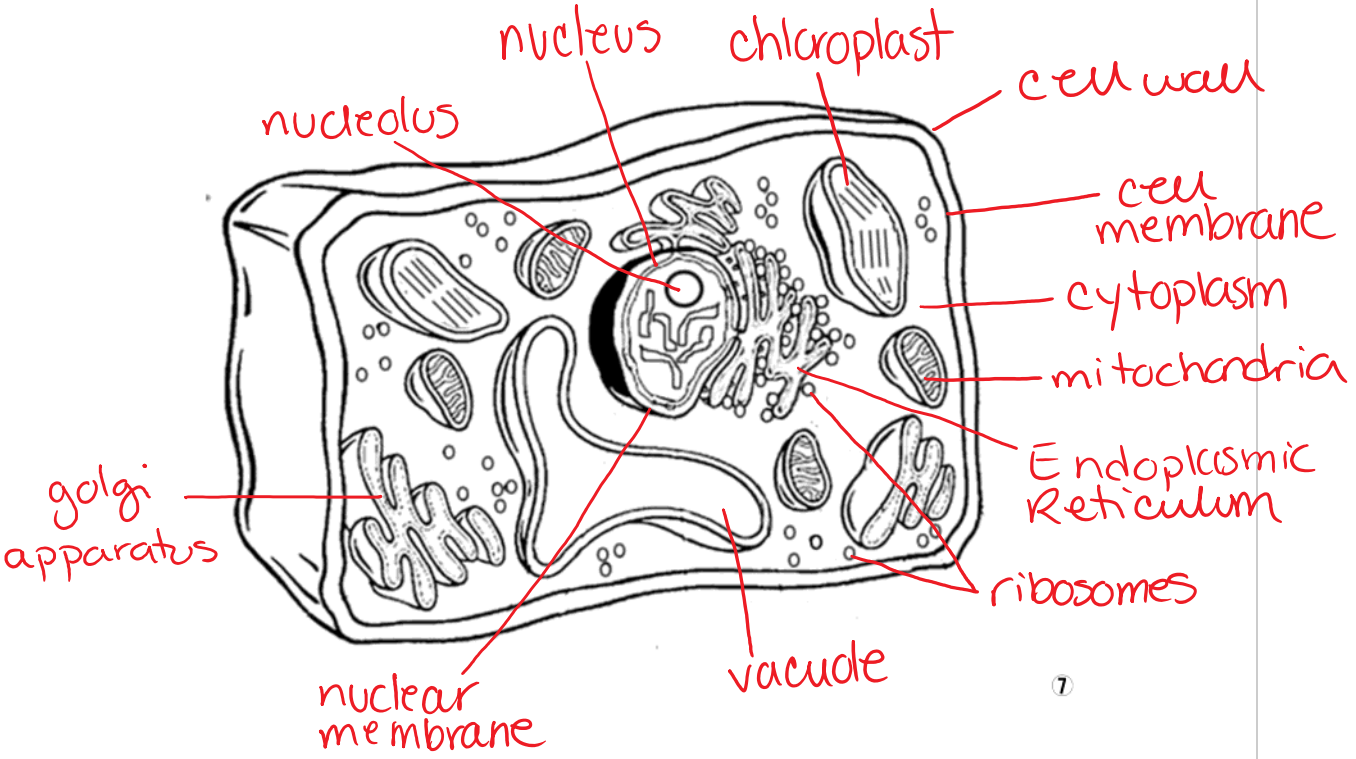
Put a check in the appropriate column(s) to indicate whether the following organelles are found in plant cells, animal cells or both.

Organelle	Plant Cells	Animal Cells
Cell Wall	✓	
Vesicle		✓
Chloroplast	✓	
Chromatin	✓	✓
Cytoplasm	✓	✓
Cytoskeleton	✓	✓
Endoplasmic reticulum	✓	✓
Golgi apparatus	✓	✓
Lysosome		✓

Organelle	Plant Cells	Animal Cells
Mitochondria	✓	✓
Nucleolus	✓	✓
Nucleus	✓	✓
Plasma membrane	✓	✓
Central vacuole	✓	
Ribosome	✓	✓
Vacuole	✓	✓

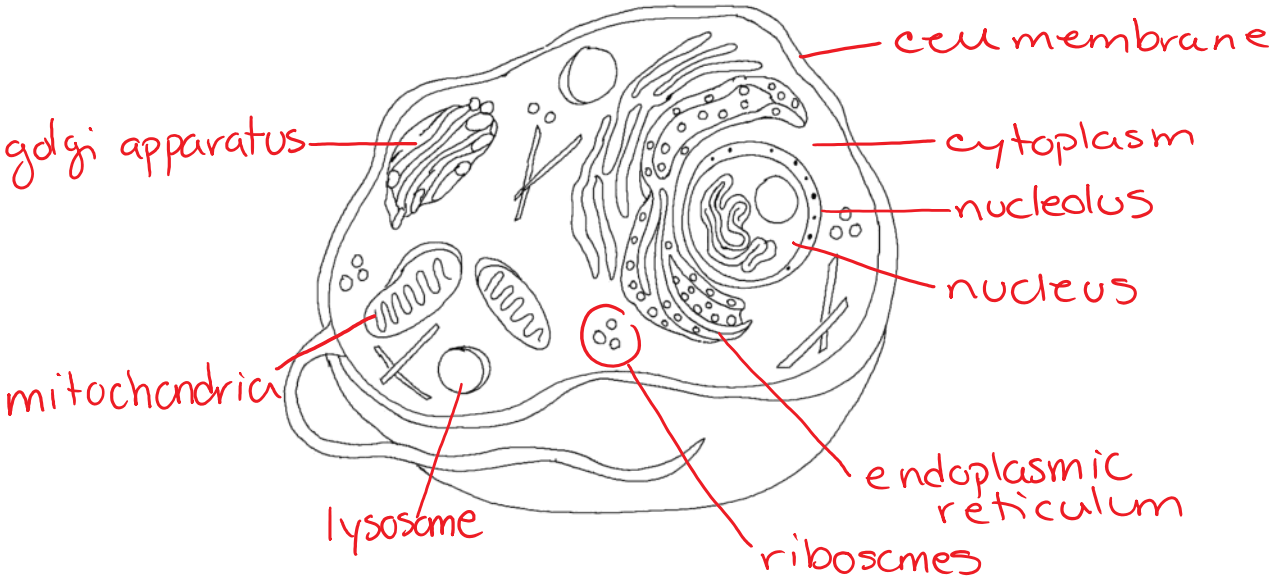
Label and show the locations of the following organelles on the diagram of a plant cell below:

Cell wall, Plasma (cell) membrane, cytoplasm, mitochondria, chloroplast, nucleus, vacuole, endoplasmic reticulum, ribosomes, nuclear membrane, nucleolus, golgi apparatus



Label and show the locations of the following organelles on the diagram of a animal cell below:

Plasma (cell) membrane, cytoplasm, mitochondria, lysosome, nucleus, endoplasmic reticulum, ribosomes, nuclear membrane, nucleolus, golgi apparatus



1. What organelle does an **animal** cell have that a **plant** cell doesn't? lysosome + centrioles

2. What is the **function** of these organelles? lysosome - disolve cell waste
centrioles - separate chromosomes in mitosis

3. What is the function of a **vacuole** in a plant cell? storage, mainly of H_2O which provides additional support.

4. What are the **three** organelles that **plant** cells have that **animal** cells don't? And **give function** of each.
   1. cell wall - structure + support
   2. chloroplast - photosynthesis
   3. large (central) vacuole - storage of H_2O - structure

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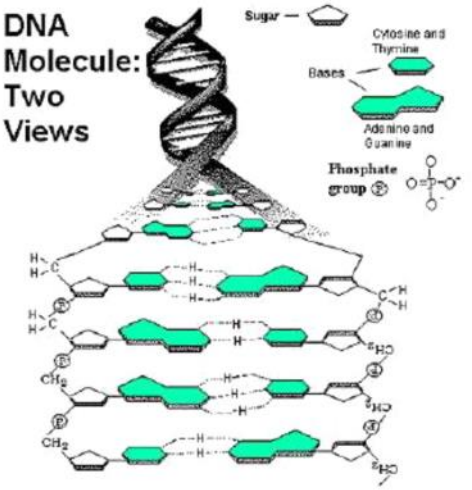
DNA Review



1. What do the letters DNA stand for?

Deoxyribonucleic Acid

2. The "backbone" of the DNA molecule is made up of two alternating components, what are these?

sugar + phosphate

3. There are four different nitrogenous bases which made up the "rungs" of the DNA ladder. What are the names of those bases?

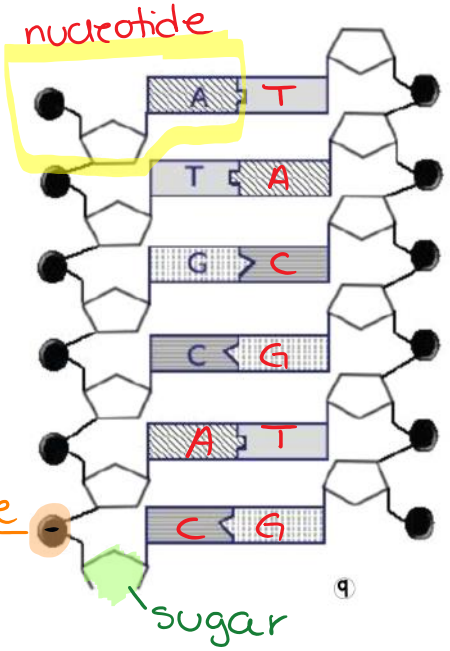
Adenine + Thymine
Guanine + Cytosine

4. Write the complementary sequence to following DNA strand:

A	A	T	T	C	G	C	C	G	G	T	A	T	T	A	G	A	C	G	T	T
T	T	A	A	G	C	G	G	C	C	A	T	A	A	T	C	T	G	C	A	A

5. **Use the image at the right to complete the follow:**

Circle a nucleotide.
Label the sugar and phosphate.
Label the bases that are not already labeled



6. Explain what the term ***complementary base pairing*** means in terms of DNA structure:

complementary base pairing means that A always pairs with T, and G always pairs with C.

The cell cycle and mitosis

Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.

Term	Descriptor
1. E cell cycle	**A.** first and longest stage of the cell cycle
2. F cytokinesis	**B.** process during which the cell copies DNA information in the nucleus
3. A interphase	**C.** result of uncontrolled cell division
4. D mitosis	**D.** process in which the duplicated contents of the cell's nucleus divide into two equal parts
5. B replication	**E.** three stages of the life of a cell
	F. final stage of the cell cycle, which separates the two nuclei and the cell contents into two identical cells

Circle the letter of the best answer.

6. Tiny tube-like structures made of protein are called

A. spindle fibres

B. chromosomes

C. nucleolus

D. DNA replication

7. Which stage is the longest in the cell cycle?

A. interphase

B. mitosis

C. cytokinesis

D. DNA replication

8. The phase of mitosis where the chromosomes line up across the middle of the cell is

A. anaphase

B. metaphase

C. prophase

D. telophase

9. The phase of mitosis in which the duplicated chromosomes form into an X shape is

A. anaphase

B. metaphase

C. prophase

D. telophase

10. The phase of mitosis in which duplicated chromosomes move apart to opposite ends of the cell is

A. anaphase

B. metaphase

C. prophase

D. telophase

11. The phase of mitosis in which a nucleolus forms around the chromosomes is

A. anaphase

B. metaphase

C. prophase

D. telophase

MITOSIS WORKSHEET

Matching: Match the term to the description

I = interphase P = prophase M = metaphase A = anaphase T = telophase

A 1. The sister chromatids are moving apart.
P 2. The nuclear membrane fades from view.
T 3. A new nuclear membrane is forms. around the chromosomes
T 4. The cytoplasm of the cell is being divided.
I 5. The chromatin is found in the nucleus.
M 6. The chromosomes are located at. the equator of the cell
T 7. The spindles disappear.
T 8. Animal cells begin to pinch in.
P 9. The spindle is formed.
M 10. Chromatids line up along the equator.
I 11. Chromosomes are not visible.
T 12. Cytokinesis begins.
T 13. The cell plate in plants **begins** to form.
T 14. The reverse of prophase.

Fill in the blanks using the word bank below:

~~Interphase~~ ~~Prophase~~ ~~Anaphase~~ ~~Telophase~~ ~~Metaphase~~

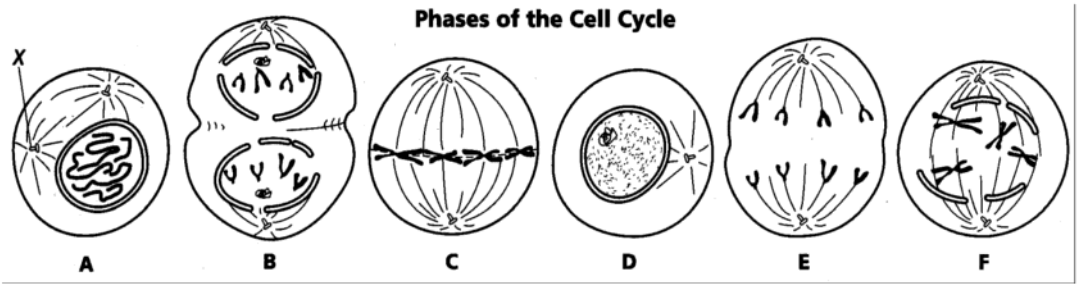
Cytokinesis (2x) ~~Sister Chromatid~~ ~~Centromere~~ ~~Cell Plate~~

Telophase 18. In what phase does the cell begin to split the cytoplasm and daughter cells first become visible in mitosis?
Anaphase 19. During what phase of mitosis do centromeres divide and the chromosomes move toward their respective poles?
Prophase 20. What is the phase where chromatin condenses to form chromosomes?
Centromere 21. What is the name of the structure that connects the two sister chromatids?
Sister Chromatid 22. In a chromosome pair connected by a centromere, what is each individual chromosome half called?
cytokinesis 23. What is the step of cell division where 2 identical daughter cells are formed?
Interphase 24. Which phase of the cell cycle occurs when the cell is preparing to divide so it grows in size making organelles and copying DNA?
Cell Plate 25. What forms across the center of a plant cell near the end of telophase?
Cytokinesis 26. What is the division of the cytoplasm called?
Metaphase 27. During this phase chromosomes line up in the middle.

1 1

Mitosis Worksheet

The diagram below shows six cells in various phases of the cell cycle. Note the cells are not arranged in the order in which mitosis occurs and one of the phases of mitosis occurs twice. Use the diagram to answer questions 1-7.



1) Cells A and D show an early and a late stage of the same phase of mitosis. What phase is it?

Interphase

2) Which cell is in metaphase?

C

3) Which cell is in the first phase of mitosis?

F - prophase

4) In cell A, what structure is labeled X?

centriole (+ spindle fibres)

5) Place the diagrams in order from first to last.

D - A - F - C - E - B

6) Are the cells depicted plant or animal cells? Explain your answer.

animal cell - no cell wall → in telophase, cell pinches in from outside (no cell plate)

7) What is the longest phase of the entire cell cycle?

Interphase

8) Why is mitosis important?

- growth
- repair
- reproduction/replication 1 2

Asexual reproduction

Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.

Term	Descriptor
1. G asexual reproduction	**A.** reproductive cells that develop into new individuals by repeated mitosis
2. D binary fission	**B.** a group of rapidly dividing cells develops on an organism and breaks away to become a new organism
3. B budding	**C.** a form of asexual reproduction in which each fragment of an organism develops into a clone of its parent
4. E clone	**D.** single parent cell splits into two equal parts that have the same copies of genetic material
5. C fragmentation	**E.** an identical genetic copy of an organism's parent
6. A spores	**F.** only found in human embryos
7. H vegetative reproduction	**G.** reproduction that requires only one parent
	H. root cells divide repeatedly to form structures that develop into a plant that is identical to the parent

Circle the letter of the best answer.

8. Asexual reproduction requires

A. only one parent to produce offspring

B. two parents to produce offspring

C. a combination of parents to produce offspring

D. two clones to produce offspring

9. Bacteria reproduce asexually by

A. budding

B. fragmentation

C. binary fission

D. cloning

10. Stem cells have the potential to

A. divide rapidly

B. increase the amount of DNA

C. become many different types of cells

D. invade other types of cells

11. During the process of cloning, scientists

A. add more DNA to the parent cell

B. remove the nucleus from an egg cell

C. remove cytoplasm from an egg cell

D. allow the egg cells to bud

12. One of the key advantages of asexual reproduction is

A. offspring compete for food and space

B. large numbers of offspring reproduce quickly

C. extreme temperatures can wipe out entire colonies

D. offspring are genetic clones

13. One of the disadvantages of asexual reproduction is

A. species cannot survive when predators increase

B. large colonies can out-compete other organisms for nutrients and water

C. large numbers of offspring reproduce very slowly

D. extreme temperatures can wipe out entire colonies

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Meiosis

Match each Term on the left with the best Descriptor on the right. Each Descriptor may only be used once.

Term	Descriptor
1. C diploid number	**A.** matching chromosomes
2. E embryo	**B.** process in which gametes from two parents combine
3. B fertilization	**C.** two sets of chromosomes
4. J gametes	**D.** produces offspring that are genetically different from each other
5. H genetic diversity	**E.** develops from a zygote
6. I haploid number	**F.** new diploid cell formed by the process of fertilization
7. A homologous chromosomes	**G.** the process of mitosis
8. D sexual reproduction	**H.** variety in a species
9. F zygote	**I.** one set of chromosomes
	J. specialized cells; sperm from males and eggs from females

Circle the letter of the best answer.

10. Human body cells have

A. 17 chromosomes

B. 23 chromosomes

C. 46 chromosomes

D. 92 chromosomes

11. The process of meiosis produces gametes with _____ as body cells.

A. the same number of chromosomes

B. one quarter the number of chromosomes

C. half the number of chromosomes

D. double the number of chromosomes

12. Sexual reproduction

I.	always produces identical offspring
II.	requires two parents
III.	increases genetic diversity

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

13. Meiosis I

A. starts with a diploid cell and ends with two haploid cells

B. starts with a haploid cell and ends with two diploid cells

C. starts with two diploid cells and ends with a haploid cell

D. starts with a two haploid cells and ends with a diploid cell

14. Meiosis II

A. starts with two haploid cells and ends with four haploid cells

B. starts with two diploid cells and ends with four haploid cells

C. starts with four diploid cells and ends with two haploid cells

D. starts with four haploid cells and ends with two haploid cells

Sexual reproduction

Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.

Term	Descriptor
1. E differentiation	**A.** development during first eight weeks
2. A embryonic development	**B.** development after first eight weeks
3. F external fertilization	**C.** the process by which gametes arrive in the same place at the same time
4. D internal fertilization	**D.** sperm cell and egg cell meet within the female
5. C mating	**E.** development of organs and body structures from blastula
	F. sperm cell and egg cell meet outside the bodies of the parents

Circle the letter of the best answer.

6. Which of the following is true of how many flowering plants reproduce?

I.	internal fertilization ✓
II.	external fertilization
III.	sperm and egg cell meet inside the female ✓
IV.	sperm and egg cell meet outside the female

A. I and III
B. I and IV
C. II and III
D. II and IV

7. In a fetus, the brain and spinal cord are starting to form at

A. two weeks
B. four weeks
C. eight weeks
D. twelve weeks

8. Fetal movements are felt at

A. four weeks
B. eight weeks
C. twelve weeks
D. sixteen weeks

Use the following chart to answer questions 9 and 10.

I.	the first and second month after fertilization
II.	the third and fourth month after fertilization
III.	the fifth and sixth month after fertilization
IV.	the seventh and eighth month after fertilization

9. Embryonic development occurs during

A. I only
B. I and II only
C. I, II, and III only
D. I, II, III, and IV

10. Fetal development occurs during

A. I only
B. II and III only
C. II, III, and IV only
D. I, II, III, and IV

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Biology Mixed Review Questions

Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

F 1. All the cells in an organism contain ~~***different***~~ same DNA.

2. An example of ***air layering*** is the bending of a grapevine stem into the soil to induce root growth.

T 3. In sexual reproduction, ***half*** the offspring's genetic information is from the male parent.

T 4. ***Male*** sex cells move by means of flagella.

F 5. The female parent contributes ~~***both***~~ one of the chromosomes in a pair of homologous chromosomes.

T 6. A diploid human cell contains ***46*** chromosomes.

F 7. Human egg and sperm cells are ~~***diploid***~~ haploid.

T 8. Combining an egg cell and a sperm cell in a female turtle is called ***internal*** fertilization.

T 9. The different heights of the students in your class is an example of ***genetic variation*** in a population.

T 10. Sexual reproduction tends to produce ***fewer*** offspring than asexual reproduction.

Multiple Choice

Identify the choice that best completes the statement or answers the question.

D 11. Organisms depend upon the asexual reproduction of cells to
a. grow.
b. form new organisms.
c. replace damaged cells.
d. all of the above.

D 12. A farmer set out to test the effectiveness of two fertilizers, Brand X and Brand Y. She placed 100 corn seeds in a farm plot with Brand X and 100 pea seeds in another plot with Brand Y. What conclusion can be drawn from the experiment?

Investigation Data: Total number of seeds germinating (visible above ground)

Variable	Day 1	Day 2	Day 3	Day 4
Brand X	6	12	24	48
Brand Y	3	6	12	24

a. Brand X is a more effective fertilizer than Brand Y.
b. Brand X is a more effective fertilizer for pea seeds.
c. Brand X is a more effective fertilizer for corn seeds.
d. No conclusion can be drawn, as two variables were changed.

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D 13. Which of the following statements describes an organism reproducing asexually?
a. A lettuce plant growing in the garden.
b. An apple containing 17 small, brown seeds.
c. A turtle depositing 5 eggs in a nest beside a pond.
d. A sea anemone splitting along its length into two new individuals.

B 14. In sexual reproduction, how much DNA does each parent contributes to their offspring?
a. 25% of their DNA
b. 50% of their DNA
c. 75% of their DNA
d. 100% of their DNA

A 15. Bacteria are considered living things because they
a. reproduce.
b. cause disease.
c. perform beneficial functions.
d. exist in extreme environments.

A 16. Which of the following events occurs during the interphase stage of the cell cycle?
a. DNA is copied.
b. The cell divides.
c. Chromosomes are separated.
d. All of the above.

D 17. What is the purpose of the cell cycle in organisms consisting of eukaryotic cells?
a. to replace damaged cells
b. to produce new organisms
c. to replace cells with a limited life span
d. All of the above.

B 18. During the cell cycle, the DNA of a cell undergoes several changes. Which of the following statements correctly sequences the changes to the DNA?
a. The DNA duplicates, lines up, separates, condenses.
b. The DNA duplicates, condenses, lines up, separates.
c. The DNA condenses, duplicates, lines up, separates.
d. The DNA condenses, separates, duplicates, lines up.

D 19. The camas bulb was cultivated by the Vancouver Island Coast Salish People as an important food source. They used periodic, controlled burning to keep the camas fields free of grass, brush, and trees. Which of the following statements regarding this traditional ecological knowledge is true?
a. It respects the natural world.
b. With permission, it can be shared to contribute to western scientific knowledge.
c. It was gained through the Salish Peoples' observation and relationship with the land in which they live.
d. All of these statements are true.

C 20. Which of the following events occurred before those shown in the diagram?

a. Spindle fibres guided chromosome movement.
b. The chromosomes lined up along the middle of the cell.
c. Both A and B occurred before.
d. Neither A nor B occurred before.

D 21. Which of the following techniques involves artificial vegetative propagation?
a. budding
b. doubling
c. duplicating
d. air layering

didn't do this.

A 22. During fertilization, the digestive substances that break through the jelly-like coating that surround an ovum are produced by the

a. sperm.
b. zygote.
c. flagellum.
d. egg nucleus.

C 23. Which of the following descriptions is an example of internal fertilization?

a. A scientist mixes sperm from a bull with eggs from a cow in a flask.
b. Brown algae called rockweed, common along the B.C. seashore, release their eggs and sperm with flagella into the water.
c. A male turtle uses a sperm depositor to place sperm into an egg-containing chamber in a female.
d. A female salmon deposits eggs in 4 or 5 nesting pockets in a riverbed and male salmon hover above, releasing large quantities of sperm over the eggs.

D 24. Which of the following organisms reproduce sexually?

a. plants
b. moulds
c. animals
d. all of the above reproduce sexually

B 25. In some species of scorpion, an unfertilized egg can develop into a new individual scorpion. If an egg was produced through normal meiosis, then the new individual scorpion will have

a. the diploid number of chromosomes, double the parent.
b. the haploid number of chromosomes, half of the parent.
c. the diploid number of chromosomes, same as the parent.
d. the haploid number of chromosomes, same as the parent.

D 26. A diploid cell contains two pairs of chromosomes. One pair is represented as A, A* and the other pair is represented as B, B*. Which of the following lists shows all the possible ways these chromosomes can be arranged in gametes after meiosis?

a. AA* BB*
b. A A*
c. AA A*A* BB B*B*
d. AB A*B AB* A*B*

B 27. Which of the following is a disadvantage for sexual reproduction?

a. The offspring are genetically different.
b. The production of gametes requires energy.
c. Offspring can be produced more quickly than by asexual means.
d. The genetic diversity of offspring allows them to respond differently to environmental changes.

D 28. How much of their genetic information will two offspring of the same set of parents have in common?

a. None of their genetic information will be the same.
b. A small amount of their genetic information will be the same.
c. All of their genetic information will be the same.
d. It is impossible to predict.

D 29. If an organism does not reproduce, its specific DNA sequence

a. is passed to offspring.
b. increases biodiversity.
c. gains genetic variation.
d. may be lost in the next generation.

A 30. A female humpback whale often mates with more than one male during mating season. What is the benefit of this behaviour?

a. It increases the chance of fertilization.
b. It increases the number of calves born.
c. It increases the genetic variation in a calf.
d. It increases the length of the gestation period.

Completion
Complete each statement.

31. A species continues to exist into the future if it's members reproduce.
32. The Kwantlen First Nation marks the return of the salmon each year during a First Food ceremony.
33. The photo illustrates sexual reproduction.

34. When Bald Eagles mate, each parent contributes 1/2 the offspring's genetic material.
35. Interphase, mitosis, and cytokinesis comprise the cell cycle.
36. The skin cells underneath a scab are undergoing mitosis/cell division.
37. Female sex cells are produced in the ovaries.
38. The number of daughter cells produced by meiosis is 4.
39. The total number of possible unique gametes produced in meiosis is given by the formula 2^n, where n is the number of pairs of chromosomes in a cell.
40. The search for a mate can expose individuals to predators/disease/harsh environmental conditions.

Matching

Match each description to one of the following terms. There is one extra term that has no match.

a. fetus
b. zygote
c. prenatal
d. prophase I
e. implanting
f. mating ritual
g. sperm nucleus
h. male reproductive cell
i. homologous chromosomes

E 41. a cell mass attaches to the lining of the uterus
D 42. a stage of meiosis
C 43. period before birth
I 44. contributed by two parents
H 45. a cell capable of movement
G 46. found in the head of a sperm
F 47. behaviour ensuring fertilization
A 48. an offspring during the final 30 weeks of development

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Match each description to one of the following pairs of terms. There is one extra pair that has no match.

a. Hair colour and height
b. Gametes and offspring
c. Algal bloom and yeast budding
d. Sexual and asexual reproduction
e. One parent and identical offspring
f. Gestation and prenatal development
g. Need for a mate and slow maturation
h. Genetic variation and genetic diversity

E 49. these two terms refer to advantages of asexual reproduction

Match the description to the best one of the following terms. There is one extra term that has no match.

a. asexual reproduction
b. sexual reproduction
c. continuity
d. sustainability
e. DNA sequence
f. chromosome
g. nucleotide
h. chromatin

F 50. DNA structure formed when a cell is ready to reproduce

E 51. a code of genetic information

A 52. offspring come from a single parent

C 53. a species exists from one generation to another

G 54. a chemical building block of DNA

H 55. coiled DNA during normal cell functioning

D 56. the ability of an environment to support a group of organisms

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Short Answer

57. Distinguish between chromatin and chromosomes.

Chromatin is the form the DNA molecule takes during normal cell functioning. It is coiled and condensed in places and loose and functioning in others. Chromosomes are the form the DNA molecule takes when a cell reproduces. The DNA molecule has duplicated and is very coiled and compact. takes when a cell reproduces. It is so coiled that the chromosome structures are clearly visible under the light microscope.

58. Compare what happens to the nuclear membrane and the cell membrane at the end of mitosis.

Two new nuclear membranes reform around the nuclear material but the cell membrane only separates the cytoplasm (including organelles) of the original cell into two new cells.

59. How is asexual reproduction in moulds and yeasts similar?

They both produce daughter cells with identical genetic information (DNA), the process in both includes mitosis and cytokinesis, they both require a favourable environment for asexual reproduction to occur.

60. Bracket fungus are interesting semicircular growths on the sides of trees and logs in the coastal rainforest of B.C. They have a rough, weather resistant top and a flat, soft, white bottom. The bottom has tiny holes that release spores. What process produces the spores? How are the spores related to the bracket fungus?

The spores are produced by mitosis. The spores are genetically identical to the bracket fungus.

61. Why is meiosis sometimes called reduction division?

In meiosis, the number of chromosomes in each cell is reduced from the normal or diploid number, to half that, the haploid number.

62. What will happen in an apple orchard containing plants produced by vegetative propagation when one plant is affected by a plant disease? Explain your answer.

Vegetative propagation means that each apple tree is genetically identical to the others, there is no genetic variation. If one plant has no resistance to the disease, then all the plants can be affected by the disease, especially in an area with trees closely spaced together. The orchard could lose all the trees to the disease.

63. Courtship rituals can include stylized dances, special calls, and displays of fighting ability. How do courtship rituals assist in sexual reproduction?

In some cases, the behaviour allows members of the same species to find or recognize each other, and a bond to form between two sexually mature individuals. This bond ensures the mating pair will work together to ensure reproduction.

64. Describe the shape and structure of DNA.

DNA consists of two strands linked like a ladder and twisted as if the two strands are wrapped around a stick or pencil. The ladder consists of four building blocks called nucleotides, often represented by the letters A, T, C, and G.

(21)