

Reproduction Review

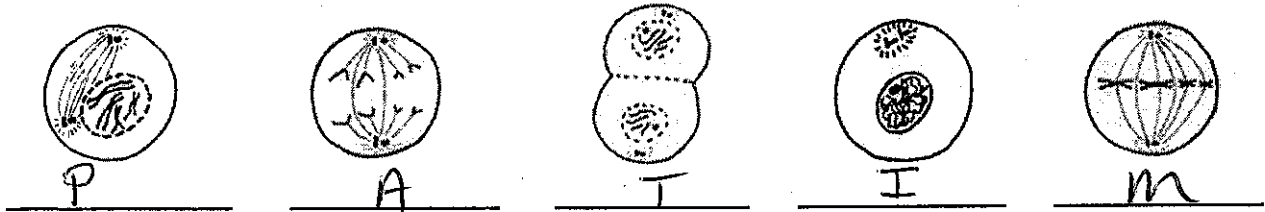
Name: Key

Answer the following questions in the space provided:

1. Match the following steps of Mitosis with the correct event that takes place and diagram:

Interphase Prophase Metaphase Anaphase Telophase

- Metaphase The Double stranded chromosomes line up in the middle of the cell
- Anaphase Chromosomes split and move to opposite poles of the cell
- Interphase Not really a stage of Mitosis, but is where growth & preparation occur
- Prophase Thin chromosomes shorten and thicken, nuclear membrane dissolves
- Telophase Cytokinesis begins; new nuclear membrane forms, daughter cells form



2. Define:

Cytokinesis: Cell membrane pinches in
 Daughter Cells: Resulting cells from mitosis

3. Fill-in the following chart for an organism that has 42 chromosomes in its somatic (body) Cells

Characteristic	Mitosis	Meiosis
# of chromosomes (end result)	diploid (42)	haploid (21)
Number of stages (steps)	4	8
Type of cell that uses.....	Somatic	Gamete -
Type of reproduction that uses...	Asexual	Sexual -
1 Benefit of using each	clones (if well adapted)	Variation

4. Match the following type of asexual reproduction with the correct definition:

1. Binary Fission 1 cells splits into two equal parts by mitosis
2. Budding 2 the cell produces a small growth by mitosis it continues to grow until it separates
3. Regeneration 3 growing back or replacing lost body parts
4. Spore Formation 4 production of thousands of highly resistant cells(spores) by mitosis
5. Fragmentation 5 a part of the organism breaks off and a new organism grows

5. Give a difference between plant and animal cells.

plants - cell wall, chloroplasts
Animal - cell membrane, centrioles

6. What is the function of the nucleus in the cell?

contains DNA (genetic info)

7. What items are found in the nucleus?

Chromosomes

8. What is meiosis? Why is it important?

↳ division of gametes - variation -

9. List the differences between sexual and asexual reproduction.

Sexual - clones

Asexual - variation -

10. Where in the female reproductive system does fertilization take place?

fallopian tube

11. Where in the female reproductive system does the zygote develop into a baby?

uterus

12. Identify the main male sex hormone. What are its main functions?

testosterone - Primary / Secondary sex characteristics
 - Sperm production -

13. List the four (4) main female hormones. For each, describe their function, and where they are produced.

LH - release egg > pituitary
 FSH - produce egg > pituitary
 Estrogen - prepare for pregnancy - ovaries
 Progesterone -

14. Fill in the chart regarding advantages and disadvantages of sexual and asexual reproduction:

	Advantages	Disadvantages
Sexual Reproduction		
	SEE NOTES	
Asexual Reproduction		

15. Describe the path of a sperm cell as it exits the male body – identify all major parts and glands.

testes → epididymus → vas deferens → seminal vesicle → prostate →
 → Cowper's gland → urethra

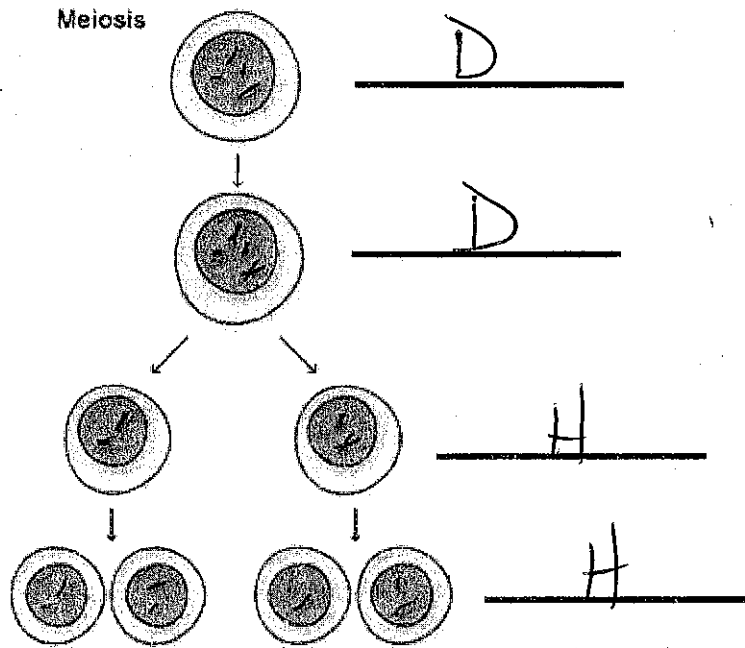
16. Describe the path of a female egg cell as it exits the body. Identify all major parts.

ovary → fallopian tube → uterus → cervix → vagina

17. If an organism has 76 chromosomes, how many will its sex cells have? How does this happen?

38 - goes from diploid to haploid in meiosis

24. In diagram of meiosis below, indicate if the cells at each step are haploid or diploid:



25. Below are several gene pairs for the trait of "hair colour". "D" represents the dominant dark hair; "d" represents the recessive blond hair.

i) DD

ii) Dd

iii) dd

a) describe each pair as "homozygous dominant", "homozygous recessive", or "heterozygous"

i) homozygous dominant ii) heterozygous iii) homozygous recessive

b) for each example above state what the hair colour of each will be.

i) Dark ii) Dark iii) light

25. Briefly state what **phenotype** means and give an **example** of a **phenotype**.

The expression of a trait - ex) free earlobes

26. Briefly state what **genotype** means and give an **example** of a **genotype**.

the genes that code for a trait ex) FF

27. A scientist crossed pea plants with red flowers with pea plants that had white flowers.
Red is dominant to white.

a. Using the letter "R" write the symbols for:

- I. Homozygous Red = RR
- II. Heterozygous Red = Rr
- III. White = rr

b. Complete the punnett square resulting from crossing **homozygous red** with **homozygous white** plants.

	R	R
r	Rr	Rr
r	Rr	Rr

a) The **genotypes** for the offspring are Rr

b) One of the offspring from above is crossed with another **homozygous white** plant. Complete a punnett square for this and state the **phenotypes** and **genotypes** of the offspring.

	R	r
r	Rr	rr
r	Rr	rr

Rr - Red
 rr - white

28. A man is **heterozygous for brown** eye colour. He marries a woman who is **homozygous recessive for blue** eye colour.

- a. What is the man's genotype? Bb
- b. What is the man's phenotype? Brown eyes
- c. Give the woman's genotype? bb
- d. Give the woman's phenotype? blue eyes
- e. Draw a **punnett square** for the above pairing of individuals.

	B	b
b	Bb	bb
b	Bb	bb

f. State the **phenotypes** and **genotypes** of their children.

Bb - Brown
bb - Blue

29. A plant breeder has a strain of corn he wants to use in breeding. However, he is unsure if the genotype of the corn is TT or Tt. Where 'T' results in stalks that are tall and 't' is for short stalks. To determine the genotype, he crosses his corn with another corn he knows to be tt.

a. Draw a punnett square for both possibilities:

TT x tt

	t	t
T	Tt	Tt
T	Tt	Tt

Tt x tt

	t	t
T	Tt	Tt
t	tt	tt

b) Clearly explain how he will know if his corn is TT or Tt.

if he doesn't get any short plants its likely TT
 if he gets any short plants, it must be Tt

7. You are a genetics counselor. Neither Mr. nor Mrs. Smith has Tay-Sachs disease, a recessive genetic disease. However, their first child died of Tay-Sachs at the age of 3. Prepare a punnett square and tell this couple how likely they are to have another child with Tay-Sachs.

Dominant = N (normal) Recessive (n) - Tay-Sachs

Parents must be carriers (Nn)

	N	n
N	NN	Nn
n	Nn	nn

$\frac{1}{4}$
 → 25% chance of having a
 child w/ Tay-Sachs

30. Create a Creature:

The **genotype** for the father "creature" $tt\ bb\ Rr\ Ff$

The **genotype** of the mother "creature" is $Tt\ Bb\ rr\ Ff$

Where: T = tall t = short

R = round body r = pear shaped body

B = large beak b = small hooked beak

F = large feet f = small feet

a) Draw a picture of each parent

Father

- Short
- hooked beak (small)
- round body
- large feet

Mother

- Tall
- large beak
- pear-shaped body
- large feet

b) What is the % **possibility** for any of their offspring to be:

i) large beaked (do a punnett square for "beaks")

	b	b	
B	Bb	Bb	50% large
b	bb	bb	

ii) homozygous for round body (do a punnett square for "bodies")

	r	r	
R	Rr	Rr	0% RR
r	rr	rr	

homozygous round = RR

iii) homozygous for small feet (do a punnett square for "feet")

$\hookrightarrow ff$

	F	f	
F	FF	Ff	25% ff
f	Ff	ff	

c) What % of their children would have their mother's body shape?

50%

d) What % of their children would be as "tall" as their father? (short)

	t	t	
T	Tt	Tt	- 50%
t	tt	tt	

31. How can you explain the fact that when you cross a tall plant and a short plant, you don't usually get offspring that are of medium height?

one trait is dominant over the other.

32. What is variation? Why is variation important to the survival of a species?

↳ differences b/w offspring & parents -
allows for adaptation/evolution -

33. What is a Karyotype and how is it useful in the detection of genetic disorders?

↳ a "picture" of all homologous pairs
of chromosomes.

allows us to see if there are extra
or missing chromosomes -

