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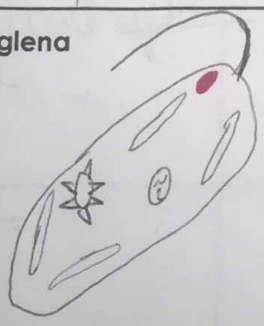
Keys to Success on the Quarter 3 EXAM

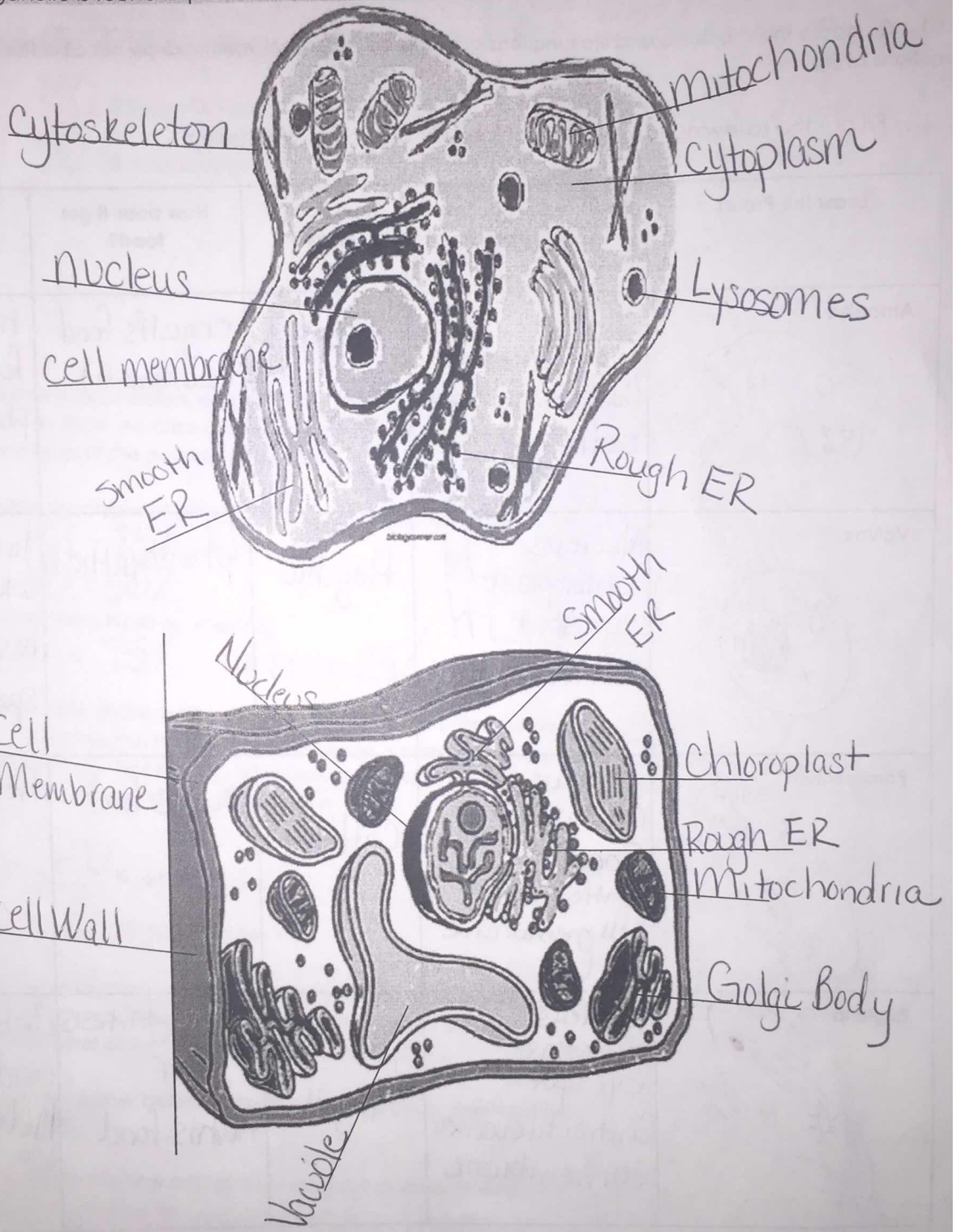
7.L.1.1 Compare the structures and life functions of single-celled organisms that carry out all of the basic functions of life .

1. Fill out the following table for the unicellular organisms we studied.

Draw the Protist	What Organelles are Present?	How does it move?	How does it get food?	Special features
Amoeba 	Nucleus food Vacuole Contractile Vacuole Cell Membrane	pseudopod	engulfs food (surrounds)	has false foot phagosytosis
Volvox 	Nucleus Chloroplast eye spot cell membrane	flagella	photosynthesis	lives in Colony has redeye spot
Paramecium 	Nucleus nucleus (macro micro) Food vacuole Contractile Vacuole Cell membrane	Cilia	hunts food	heterotroph
Euglena 	Nucleus Chloroplast eye spot Contractile vacuole Cell membrane	flagella	photosynthesis or hunts food	Autotroph and heterotroph

7.L.1.2 Compare the structures and functions of plant and animal cells, including major organelles .

2. Label the following Cells and their organelles and in the table below select whether the organelle is found in plants, animals or both. Describe the organelles function (job).



Organelle	Found in Plants	Found in animals	Function
Cell Wall	X		Provides protection/support hold shape
Cell Membrane	X	X	Provides protection directs what goes in and out of cell
Mitochondria	X	X	Provides energy for cell
Cytoplasm	X	X	gel-like substance allows organelles to move around in cell
Chloroplast	X		place where photosynthesis occurs - converts light energy into food for cell
Nucleus	X	X	'brain' of cell directs all activities

	plant	animal	
Golgi Body	X	X	packages proteins + materials to get ready to send out
Vacuole	X	X	Storage area for water, food, waste + enzymes
Endoplasmic Reticulum	X	X	Transports substances throughout cell
Ribosomes	X	X	'Factories' that produce proteins
Nucleolus	X	X	Makes ribosomes + sends to ER

7.L.2.1 Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).

3. What is sexual reproduction? Need sperm/egg
produces offspring that are genetically different
2 parents → ½ chromosomes come from 'male'; ½ come from female

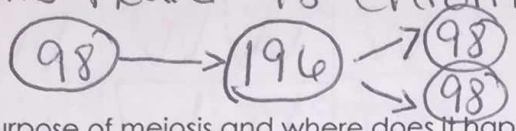
4. What is asexual reproduction?
1 parent; produces offspring that are genetically identical to parent No genetic variety

5. What is the purpose of mitosis and where does it happen? What kind of cells are produced?

Mitosis is to replace/repair cells; allows for growth
Happens in body cells. Cells identical to parent cell produced

6. If a single cell starts out with a diploid number of 98 chromosomes and undergo mitosis how many new cells will be formed and how many chromosomes will each new cell have? Draw a picture to show the process.

New cells formed = 2 (identical to parent cell)
New cells have 98 chromosomes

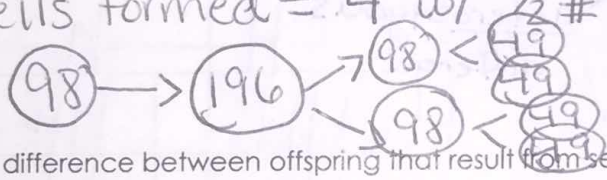


7. What is the purpose of meiosis and where does it happen? What kind of cells are produced?

Meiosis produces sex cells which then allows for sexual reproduction; happen in sex cells; ½ of # of chromosomes in sex cells

8. If a single cell starts out with a diploid number of 98 chromosomes and undergo meiosis how many new cells will we have in the end and how many chromosomes will each new cell have? Draw a picture to show the process.

New cells formed = 4 w/ ½ # of chromosomes as parent cell



9. What is the difference between offspring that result from sexual reproduction vs asexual reproduction include, complexity of the offspring, number of parents, relative parental care, and genetic variation in the offspring.

less complex (simple)

Asexual	Sexual
1 parent (budding, splitting, fragmenting)	2 parents (egg/sperm) (more complex organisms)
Genetically identical offspring	genetically unique offspring
little to no parental care	Longer gestation (pregnancy); higher survival rates. Lots of parental care
No genetic variation	50% from mom 50% from dad

7.L.2.2 Infer patterns of heredity using information from Punnett squares and pedigree analysis.

10. Mendel worked with pea plants and made the following crosses. Complete the Punnett Squares and below each square put the genotypes and phenotypes formed and list their percentages.

R = red, r = white

a. Homozygous Dominant X Homozygous Recessive

RR x rr

	R	R
r	Rr	Rr
r	Rr	Rr

geno = Rr 100%.
pheno = red 100%.

b. Homozygous Dominant X Heterozygous

RR Rr

	R	R
R	RR	RR
r	Rr	Rr

RR = 50% Rr = 50%
Red = 100%.

c. Heterozygous X Heterozygous

Rr x Rr

	R	r
R	RR	Rr
r	Rr	rr

geno = RR = 25% Rr = 50% rr = 25%
pheno = Red = 75% white = 25%

d. Heterozygous X Homozygous Recessive

Rr rr

	r	r
R	Rr	Rr
r	rr	rr

Geno = Hr = 50 rr = 50
Pheno = Red = 50 White = 50

11. Let's say that in seals, the gene for the length of the whiskers has two alleles. The dominant allele (W) codes long whiskers and the recessive allele (w) codes for short whiskers.

a. What is the probability of producing offspring that have short whiskers from a cross of two long-whiskered seals, one that is homozygous dominant and one that is heterozygous? Show your work on the Punnett square.

WW = long
Ww = long
ww = short

100 % long whiskers

0 % short whiskers

	W	w
W	WW	Ww
W	WW	Ww

12. In purple people eaters, one horn (H) is dominant and no horns (h) is recessive. Complete the Punnett square to show the cross of two hybrid purple people eaters. Summarize the genotypes and phenotypes of the possible offspring.

HH = horn
Hh = horn
hh = no horn

heterozygous
different

	H	h
H	HH	Hh
h	Hh	hh

Possible genotypes of offspring:

HH = 25% Hh = 50% hh = 25%

Possible phenotypes of offspring:

horn = 75% no horn = 25%

13. **In Noombats, yellow bellies (Y) are dominant over green bellies (y).**

a. Complete the Punnett square to show a cross between a purebred yellow bellied Noombat and a Noombat that is a hybrid for belly color. What is the probability that the parents will have yellow bellied offspring?

homo
hetero

YY = yellow
Yy = yellow
yy = green

100 % yellow bellied

0 % green bellied

	Y	Y
Y	YY	YY
y	Yy	Yy

14. Is it possible for two yellow bellied Noombats to have a green bellied child? Identify the genotypes of the parents and complete the cross on the Punnett square.

a. Genotypes of the parents: Yy and Yy

b. Can the yellow bellied parents produce a green bellied child?

yes

c. If yes, explain how and identify what the probability would be.

each parent must carry the recessive allele to have a 25% chance of having a green bellied child

	Y	y
Y	YY	Yy
y	Yy	yy