

Name _____ Date _____

REVIEW FOR FINAL EXAM

- List the appropriate steps in planning/carrying out an experiment on the effect of heat on the function of a certain enzyme:

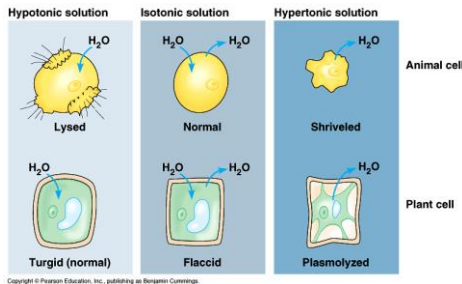
Observe, define problem, form question, research problem, state hypothesis, experiment and collect data, analyze data, reflect findings, communicate results

- Differentiate between passive and active transport. Which requires energy? Which moves with the concentration gradient and which moves against the concentration gradient?

Passive transport – no energy, moves with concentration gradient

Active transport – requires energy, moves against concentration gradient

-



Define hypotonic: low concentration of solute

Define hypotonic: high concentration of solute

Define isotonic: same concentration of solute:

- Fill in the table below concerning biomolecules

Compound	Building Blocks	Elements Present	Uses in the Body
Carbohydrate	Monosaccharides	C, H, O	energy
Proteins	Amino Acid	C, H, O, N	Muscles, enzymes
Lipids	Fatty acids & glycerol	C, H, O	
Nucleic acids	Nucleotides	C, H, O, N, P, S	Genetic Info

5. Explain the effect that heat and pH have on enzymes?

Enzymes can only tolerate small changes in pH and temp, outside this they denature

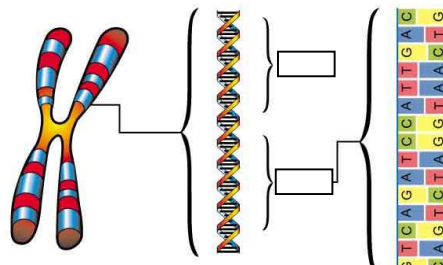
6. Compare asexual and sexual reproduction

Reproduction	Cell Division	Cell Type	Offspring Generated	Diversity of offspring
Asexual	Mitosis	Body cells	Diploid	none
Sexual	Meiosis	gametes	Haploid	A lot

7. Use the words chromosome, gene, DNA and trait in a complete sentence that describes the relationship between them...

Chromosomes contain DNA. Segments of DNA are called genes that code for a trait.

8. DNA structure: Chromosome DNA Gene



Label the above diagram with gene, chromosome, or DNA

9. Describe the three types of genetic mutations listed below...

- a. Deletion- loss of a nucleotide, which is very significant
- b. Substitution- replacing one nucleotide for another, which is not always significant
- c. Insertion- adding a nucleotide, which is very significant

10. Label the type of mutation

	Original	Mutation	Type
a.	G-T-C-C-A-T-G-C-A	G-T-C-C-A-T-G	Deletion
b.	G-T-C-C-A-T-G-C-A	G-A-C-C-A-T-G-C-A	Substitution
c.	G-T-C-C-A-T-G-C-A	G-A-T-C-C-A-T-G-C-A	Insertion

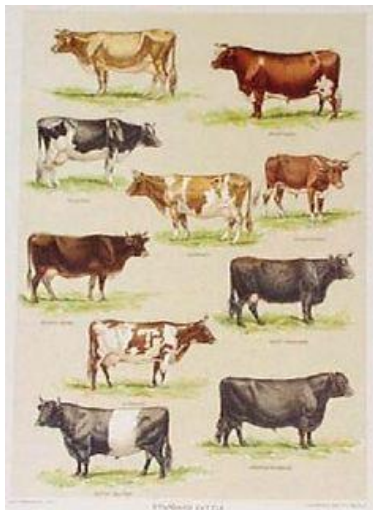
11. Which one of the above mutations is most significant and why?

Deletion and insertion are the most significant because they affect the rest of the codons in that DNA by shifting everything.

12. Mutations in what type of cells can be passed on from parent to offspring?

Mutations in gametes are passed on to offspring

13. The cows below are the result of selective breeding. Describe the process...



When humans determine the types of traits that are favorable and choose which organisms will mate and produce offspring

14. What kind of data support the successful evolution of a species?

When the percent of the population with the favorable trait increases

15. Describe each of the following examples of evidence of evolution:

a. Fossil Record

Shows similarities among organisms

b. Comparative Anatomy (homologous structures)

Homologous structures have similar structure but different functions. This shows that they evolved from common ancestors

c. Comparative embryology

Vertebrate embryos are very similar early in development, which shows they evolved from a common ancestor

d. Comparative biochemistry

All organisms have similar chemical (like DNA), which shows they evolved from a common ancestor

16. What are behavioral adaptations? Give two examples.

Behaviors that allow organisms to survive and produce offspring. Examples: mating rituals, migration patterns

17. What is competition? Give two examples of how species have evolved to decrease competition?

Fighting for resources

18. Natural Selection

a. What is an adaptation?

a change or the process of change by which an organism or species becomes better suited to its environment

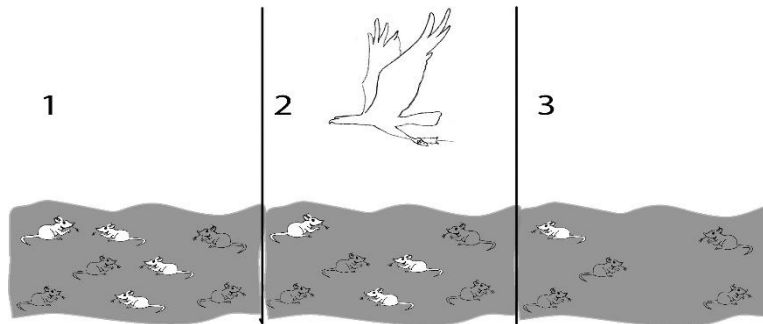
b. What is variation?

the difference between a trait is called variation.

c. What is natural selection?

Nature determines the inheritable traits that help organisms survive and reproduce so these traits become more common in a population over time

d. Observe the diagram below:

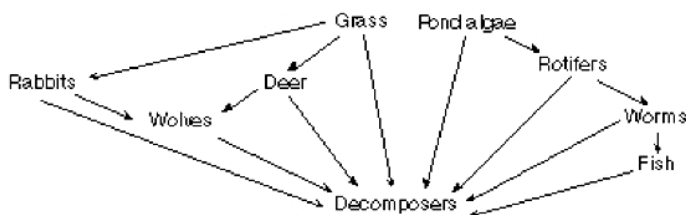


- Describe what is happening in figures 1-3.
Mice in an ecosystem are preyed on by a bird. The mice with the trait (color) that makes them best adapted for the environment will survive while those without that trait are not adapted for the environment and will be eaten
- Is the population of mice different in figure 3 than in figure 1? Explain why.
In figure 3, three out of four of the mice are eaten because they are not well adapted to the environment
- What characteristic of the mice is an adaptation that increased their fitness?
color

19. In a food pyramid, approximately what percent of energy is transferred from one level to the next? Where does the remainder of the energy go?

10 %, the remaining 90% is lost to waste

20. The food web below shows some of the relationships that exist between organisms in a field and pond ecosystem.



- Identify a carnivore from the food web **Wolves and Fish**
- Describe the complete path of energy from the Sun to that carnivore **Grass-Rabbit-Wolf**
- Explain why decomposers are necessary in this food web **Recycle matter into ecosystem**
- A significant decrease in the wolf population occurs. After a period of one year, what change in the grass population would most likely be observed? **Rabbit and Deer increase and then grass goes down**

- e. A farmer sprayed pesticides on a field next to the pond. Explain why several years later the fish population would contain higher pesticide levels than any other pond organisms would contain.

Smaller number of organisms with the same amount of pesticides

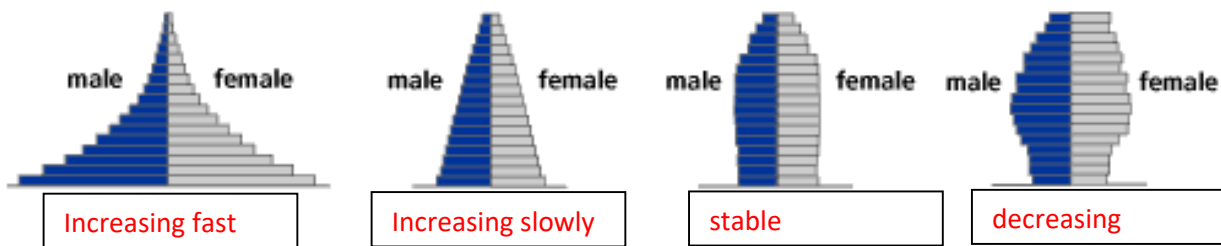
21. In an ecosystem, living factors are called _____ **biotic** _____ and non-living factors are called _____ **abiotic** _____

22. What is the carrying capacity of an ecosystem?

The maximum amount of organisms an ecosystem can support

23. Population distributions:

Label the picture above as stable, increasing fast, decreasing, and increasing slow.



- 24.

- a. Write the general chemical equation for photosynthesis. What kind of organism carries out this process? Where does this process take place?

Water and carbon dioxide yield glucose and oxygen

Autotrophs

Chloroplast

- b. Write the general chemical equation for cellular respiration. What kind of organism carries out this process? Where does this process take place?

glucose and oxygen yield water and carbon dioxide

Autotrophs and Heterotrophs

Mitochondria

- c. What are the two types of cellular respiration? What conditions are needed for each? Which process produces the most ATP?

Aerobic (with oxygen) produces more energy than Anaerobic (without oxygen)

25. Deoxyribose Nucleic Acid

a. What are the building blocks? Draw and label the parts...

Nucleotides

Contain phosphate, deoxyribose sugar and a nitrogen base

b. What process makes RNA from DNA? Where does this occur?

Transcription takes place in the nucleus

c. What process occurs at the ribosomes? What molecule is produced in this process?

Translation produces proteins

d. The sense strand of a DNA molecule is:

TCAATGCCA

The mRNA sequence from this DNA molecule is :

AGUUACGGU

What is this process called

transcription

Where does it occur

nucleus

Use the codon chart below to determine the amino acids associated with this strand:

Condon Chart

	U	C	A	G	
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic Acid	Glycine	U
	Valine	Alanine	Aspartic Acid	Glycine	C
	Valine	Alanine	Glutamic Acid	Glycine	A
	Valine	Alanine	Glutamic Acid	Glycine	G

First amino acid: **_Iso_**

Second amino acid: **_Try_**

Third amino acid: **_Gly_**

26. Purple flowers (P) are dominant to white flowers (p).

Perform the following crosses. For each cross, give the phenotype and genotype of all offspring.

A. PP x pp

100% heterozygous

100% purple

B. Pp x Pp

25% homozygous dom.

75% purple

50% heterozygous

25% white

25% homozygous rec.

C. PP x Pp

50% homozygous dom

100% purple

50% heterozygous