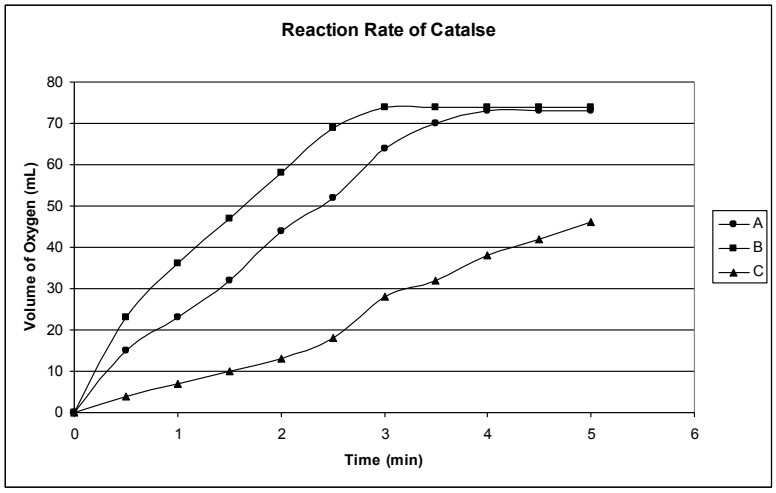
Biology Quarter 3 Final Review (Part 1)

Scientific method

The following graph is from an experiment on the effects of different temperatures on the reaction rate of catalase. Catalase is an enzyme that breaks hydrogen peroxide into water and oxygen. In the experiment, the volume of oxygen produced through the decomposition of hydrogen peroxide by catalase was measured over time. Each variable was tested in the same way using the same amount of hydrogen peroxide each time and the same volume of enzyme solution.

A = 70 degrees **B = 50 degrees** **C = 30 degrees**



1. List some possible inferences that lead to this experiment?
2. What is a possible hypothesis for the kids experiment?
3. What is the independent variable?
4. What is the dependent variable?
5. What are the constant variables?
6. Based on the data, what can you conclude?

Macromolecules

7. Why are carbohydrates an important part of the human diet?
8. What are the functions of fats?
9. Why is it important for mammals to include protein in their diet?
10. What is the function of enzymes? Why is shape important to enzymes?
11. How do low temperatures affect the reaction rate of enzymes? Why does this happen?
12. How do high temperatures affect the reaction rate of enzymes? Why does this happen?
13. How do extremely high temperatures affect enzymes? Why does this happen?
14. How does increasing or decreasing the amount of enzymes affect the reaction rate of enzymes? Why does this happen?

Cells

15. What is the primary function of the nucleus?
16. How does the nucleus accomplish this function?
17. What is the function of chromosomes?
18. What are the functions of the cell membrane?
19. What is the cell membrane composed of? What is the structure of the cell membrane?
20. What is the function of ribosomes? How are free and bound ribosomes similar and different?
21. What is the function of Golgi bodies? What types of cells would contain a lot of Golgi bodies?
22. What is the function of mitochondria? What types of cells would contain a lot of mitochondria?
23. Why are mitochondria unique in comparison other cell organelles?
24. What is the function of vacuoles?
25. What is the function of lysosomes? What types of cells would contain a lot of lysosomes?

Cellular Transport

26. Explain how diffusion works. Use drawings to aid your explanation.
27. Explain how osmosis works.
28. What is an isotonic solution? Use drawings to aid your explanation.
29. What is a hypotonic solution? Use drawings to aid your explanation.
30. What is a hypertonic solution? Use drawings to aid your explanation.
31. Explain how facilitated diffusion works. Use drawings to aid your explanation.
32. What are the differences between passive transport and active transport?
33. Briefly but completely explain why you can kill slugs by putting salt on them.
34. Briefly but completely explain how white blood cells destroy bacteria.

Enzymes and Catalase Lab

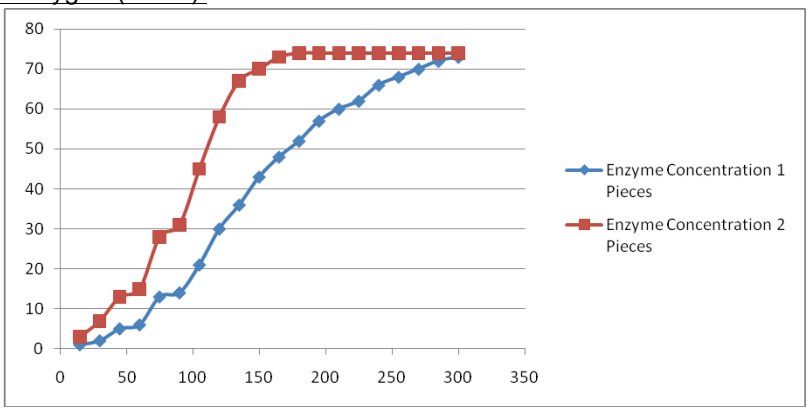
35. What 3 letters do the names of almost all enzymes end with?
36. Why is the shape of an enzyme important? (Think about the shape of the active site on the
37. Enzyme and the substrate that binds to it.)
38. Why does increasing temperature increase reaction rate of enzymes?
39. Why does increasing enzyme concentration increase reaction rate of enzymes?
40. Are enzymes used up in the reactions they catalyze?
41. What pH does catalase work the most efficiently in?
42. Why does increasing the amount of catalase increase the reaction rate?

Catalase is an enzyme in liver. It breaks down Hydrogen Peroxide into Oxygen (O2) and water.
The X axis is time (in seconds), the Y axis is volume of Oxygen (in mL).

Label each axis appropriately.

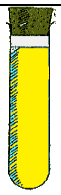
Use the graph to answer the questions below.

43. Did 1 piece (of liver) or 2 pieces increase the reaction rate the fastest?
44. Why does the line for 2 pieces eventually become horizontal?



Photosynthesis

Phenol is a chemical that turns yellow when in the presence of acid, and turns red when in the presence of a base. Carbon Dioxide (CO2) is acidic, while Oxygen (O2) is basic. When a person breathes into phenol in turns yellow. Use this information and the charts below to answer the following questions. (the equation for photosynthesis will help you)

Before being in the sun	 Solution is Red	 Solution is Yellow	 Solution is Red	 Solution is Yellow
After being in sun	 Solution is Red	 Solution is now red	 Solution is Red	 Solution is Yellow

45. Why does phenol turn yellow when someone breathes into it?
46. Why does the reacted (yellow) solution with the plant turn to red after being in the sun?
47. If the test tube with the reacted (yellow) solution with the plant was placed in the dark instead of the sun, would it change to red or stay yellow? Explain why or why not.
48. What plant cell organelle is responsible for photosynthesis?
49. What is the purpose of chlorophyll?
50. What is the chemical equation for photosynthesis? Write both versions.

Cellular Respiration

51. What organelle is responsible for releasing energy stored in glucose?
52. What is the chemical equation for cellular respiration? Write out both versions.
53. What is the major difference between aerobic and anaerobic respiration?
54. How is lactic acid fermentation responsible for making muscles fatigued and sore?
55. What type of fermentation is used to make yogurt

Biology Quarter 3 Final Review (Part 2)

Asexual and Sexual Reproduction

56. What are the reasons for cell division?
57. What is asexual reproduction?
58. Describe an example of asexual reproduction.
59. What is sexual reproduction?
60. What are the differences between somatic and reproductive cells?
61. What are the benefits to asexual reproduction?
62. What are the potential downfalls to asexual reproduction?
63. What are the benefits to sexual reproduction?
64. What re the potential downfalls to sexual reproduction?

Cell Division: Mitosis

65. What is mitosis?
66. What happens during interphase? Use drawings to aid your explanation.
67. What happens during prophase? Use drawings to aid your explanation.
68. What happens during metaphase? Use drawings to aid your explanation.
69. What happens during anaphase? Use drawings to aid your explanation.
70. What happens during telophase? Use drawings to aid your explanation.
71. Why must chromosomes replicate during interhpase?
72. Why must identical chromosomes separate during mitosis?

Cell Division: Meiosis

73. What is a diploid cell? Provide an example.
74. What is a haploid cell? Provide an example.
75. What are gametes?
76. How many chromosomes are in human gametes?
77. How many chromosomes are in the gametes of an organisms with 2n=100?
78. How many chromosomes are in the somatic cells of an organism with n=35?
79. What are homologous chromosomes?
80. What is meiosis?
81. What happens in meiosis I? Why is it important for reproductive purposes that this occurs?
82. What happens in meiosis II?
83. What is crossing over? Why is crossing over important?
84. Why are the cells produced through meiosis not identical to each other?

Basic genetics

85. What are genes and where are genes located?
86. What are alleles?
87. What is a dominant gene and how are dominant genes represented?
88. What is a recessive gene and how are recessive genes represented?
89. What does heterozygous mean? Provide an example.
90. What does homozygous mean? Provide an example.
91. What does geneotype mean? Provide an example.
92. What does phenotype mean? Provide an example?
93. Why does the phenotype of an organism not always reveal its genotype?
94. What is complete dominance? Provide an example.
95. What is incomplete dominance? Provide an example.
96. What is co-dominance? Provide an example.
97. What are sex-linked genes? Provide an example

Genetics Problems

Two brown fur floppy ear rabbit [BbFf] mate: (Rabbits have two alleles for fur color and ear shape)

Rabbit fur color: **B** = brown fur **b** = white fur
Rabbit ear shape: **F** = floppy ears **f** = straight ears

98. What is the probability of producing a rabbit with brown fur and floppy ears?
99. What is the probability of producing a rabbit with white fur and straight ears?
100. What is the probability of forming a rabbit with the genotype bbFf ?
101. What is the probability of forming a rabbit heterozygous for both traits?
102. Two rabbits with floppy ears and brown fur mate. Some of their offspring have straight ears and white fur.
    a) What is the genotype of the parents?
    b) What is the phenotype ratio of all the potential offspring they could form?

A pink snapdragon is mated with a pink snapdragon.

Snap Dragon Flower Color: C^R = red flower C^W = white flower

103. What is the probability of producing a red snapdragon?
104. What is the probability of producing a pink snapdragon?

Two heterozygous plants mate (PpTtRrYy x PpTtRrYy)

Flower Color: **P** = purple flower **p** = white flower
Seed shape: **R** = round seed **r** = wrinkled seed
Plant height: **T**= tall plant **t** = short plant
Seed color: **Y** = Yellow seed **y** = green seed

105. What is the probability of producing a purple flowered, short plant with round, yellow seeds?
106. What is the probability of producing a white flowered, short plant with wrinkled, green seeds?
107. What is the probability of producing a plant with the genotype PPTtRrYY?
108. What is the probability of producing a plant with the genotype ppTTrrYy?

Blood Type Alleles: I^A I^B **i**

109. A father has blood type AB and a mother has blood type O. What is the genotype and phenotype ratio of their possible children if they mate?

110. A child has blood type B, his father has blood type A, and his mother has blood type B. What are the possible genotypes of the child, father and mother?