**100 Facts to Know for the Regents**

1. Organelle, cell, tissue, organ, organ system, organism.
2. Diffusion is the movement of substances from where there is more to where there is less.
3. Osmosis is the diffusion of water. Osmosis will cause a cell to change in volume (shrivel, or expand)
4. An onion cell in salt water- cell wall will remain the same, the cell membrane will shrivel and lose water.
5. Starch indicator turns blue/black in the presence of starch.
6. Glucose indicator test must be heated
7. Glucose and water are small and permeable to the membrane
8. Starch is not permeable to the membrane, it is too big
9. Photosynthesis uses solar energy to turn inorganic raw materials into an organic, energy-rich molecule- glucose
10. Organic molecules store energy in the bonds between their atoms. The energy can be released when they are broken down during cellular respiration.
11. The equation for photosynthesis is water + carbon dioxide ---> glucose + oxygen
12. Photosynthesis occurs in the chloroplast of all producers (plants)
13. Cellular respiration occurs in the mitochondria of every single cell
14. The equation for cellular respiration = oxygen + glucose ---> carbon dioxide + water + ATP
15. ATP is used to power all cellular activities and life functions.
16. ATP is NEVER transferred. It is used and lost as heat to the environment
17. Enzymes are catalysts that speed up chemical reactions in living things
18. ALL enzymes are proteins with a specific shape
19. An enzyme can only catalyze ONE specific chemical reaction. It fits ONE substrate
20. Enzymes work in specific temperature and pH ranges
21. If an enzyme is not at its optimum temperature or pH, it will slow down
22. If an enzyme going out of its range, it denature (loses its shape).
23. The circulatory system is the body’s transportation system. The heart pumps blood through vessels. Blood carries many different substances around the body.
24. The respiratory system allows our body to get oxygen into the body for cellular respiration, and allows us to get rid of carbon dioxide waste from cellular respiration.
25. FEEDBACK MECHANISM- pulse rate and breathing rate increase in response to exercise. Cells need more oxygen to do cellular respiration and make more ATP
26. The digestive system is the body system that breaks down food into very small molecules that can diffuse into cells for cellular respiration
27. Blood sugar levels increase after eating
28. FEEDBACK MECHANISM- The pancreas secretes the hormone insulin. Insulin controls blood sugar levels. Insulin levels increase in response to high blood sugar levels. This maintains homeostasis
29. Hormones are chemical messages that flow through the blood stream
30. Hormone messages are received by specific receptor molecules only.
31. The female reproductive hormones are estrogen and progesterone
32. The male reproductive hormone is testosterone
33. The female reproductive organs are ovaries and the uterus
34. The male reproductive organ is the testes
35. Meiosis is cell division that makes gametes with HALF the DNA
36. Fertilization is the joining of egg and sperm to create a zygote with complete DNA
37. The zygote is the first cell of the new organism.
38. The zygote divides by mitosis to grow in size, and then differentiates to form specialized cells.
39. The first 8 weeks of life are when all of the essential organs develop. The organism is called the EMBRYO.
40. The more advanced organism is called the fetus.
41. Drugs, alcohol, and tobacco can put the embryo/fetus at risk for mutations. These substances can pass through the placenta.
42. The placenta is attached to the uterus. It supplies the embryo/fetus with oxygen/nutrients and takes away waste.
43. The immune system is the body’s defense system made of white blood cells.
44. White blood cells flag pathogens for destruction and engulf pathogens.
45. An antigen is a molecule that can trigger an immune response.
46. If the immune system recognizes an antigen, it will produce antibodies to attack
47. A vaccine contains a weakened version of the pathogen/virus
48. The immune system makes antibodies to prepare for an attack in response to the vaccine
49. An allergy is an immune response to a usually harmless environmental substance
50. HIV is a virus that causes AIDS. AIDS weakens the immune system.
51. A gene is a segment of DNA that codes for a protein.
52. Genes are represented as bands on a chromosome.
53. DNA must be translated into mRNA before it can be read by the ribosome.
54. The ribosome reads the mRNA to make an amino acid chain, which will turn into a protein.
55. The amino acid sequence determines the SHAPE and FUNCTION of the protein.
56. Selective breeding is controlled reproduction where DESIRABLE TRAITS are chosen
57. GENETIC ENGINEERING is used to insert genes from one organism into another.
58. Enzymes are the molecules that can cut and paste DNA
59. YES. Changes in the DNA are passed on to all cells that form by mitosis from the changed cell.
60. Mutated body cells will pass the mutation to any body cell that forms by mitosis from that cell.
61. The mutation must occur in the GAMETE (sperm or egg) to be passed on to offspring.
62. Adaptations are traits that help an organisms survive/compete in its environment
63. Speed, intelligence, good eyesight, sharp claws, warm feathers, strong beak…etc.
64. Overtime, the population of the best fit organisms will increase.
65. The population of organisms that are not fit will decrease, and they may go extinct.
66. Genetic Recombination is the recombining and sorting of genes during meiosis and fertilization (sexual reproduction)
67. Genetic variation increases the chances that someone in a population will survive any environmental changes
68. Because of variation, some insects might have the genes to survive the pesticide. The insects that survive will reproduce, and the population of pesticide resistance insects will increase.
69. The fossil record is the most important source of evidence for evolution
70. A species goes extinct when its adaptations are no longer fit in a changing environment.
71. Extinctions are very common. Most species that were once living and now extinct.
72. Paper chromatography is used to separate pigments.
73. Gel electrophoresis is a technique used to separate DNA fragments by size.
74. Scientists use enzymes to cut DNA into fragments.
75. The smallest fragments will travel the farthest from the “wells.”
76. The species with the most similar bands are the most closely related.