

LIFE SCIENCE FINAL STUDY GUIDE ANSWERS

Standard 1: Cell Biology (Chapter: 2-5, pgs 50-165)

1. Living things can be made of **ONE** to **TRILLIONS** of cells.
2. How do we generally look at cells? (p. 114) **UNDER A MICROSCOPE**
3. What are two differences between plant and animal cells? (p. 120-121) **CHLOROPLASTS AND CELL WALLS**
4. Where is the DNA or genetic material of a plant or animal found? (p. 118) **CHROMOSOMES (NUCLEUS IN PLANTS AND ANIMALS)**
5. Which organelle liberates energy for the cell? (HINT: It is called the power house of the cell) (p. 124) **MITOCHONDRIA**
6. Where does photosynthesis take place in a cell? (p.124) **CHOLORPLASTS**
7. What is mitosis? After one division, how many cells are produced through the process of mitosis? (p. 154-155) **WHEN A CELL DIVIDES TO CREATE 2 IDENTICAL CELLS THAT HAVE THE SAME DNA**
8. As a multi-cellular organism develops, what happens to its cells? (p. 129) **DIFFERENTIATE**
9. What is the smallest unit of life? (p. 128) Name an organism that is single-celled and one that is multi-cellular. **A CELL. SINGLE: BACTERIA, MOST PROTISTS MULTI: ANIMALS, PLANTS, FUNGI**
10. Where do cells come from? (p. 115) **OTHER CELLS**

Standard 2: Genetics (Chapter: 2 & 6, pgs 54, 174-186)

1. Define asexual reproduction. How is it different from sexual reproduction? (p. 54) **ASEXUAL REPRODUCTION IS WHEN 1 PARENTS CREATES OFFSPRING THAT ARE GENETICALLY IDENTICAL TO THE PARTEN. SEXUAL REPRODUCTION IS WHEN 2 PARENTS CREATE AN OFFSPRING THAT IS GENETICALL A COMBINATION OF THE 2 PARENTS.**
2. How many parents are needed for each kind of reproduction? (p. 54)
How much of the DNA comes from the parent in each kind of reproduction?
Asexual Parents = **1** DNA = **ALL** Sexual Parents = **2** DNA = **HALF**
3. What kind of reproduction gives the offspring the most variety? **SEXUAL** (p. 54)
4. A trait can be determined by **ONE OR MORE** genes. (p. 158-159) Plants and animals have **THOUSANDS** genes. (p. 185)
5. In general, how many copies of each gene do organisms have? **2** Different copies of a gene are called **ALLELES** (p. 182)
6. Alleles can be **DOMINANT**, which will always show itself if it is present or **RECESSIVE** which will only show itself if both alleles present are the same. (p.177)
7. If you cross a rabbit with white fur (bb) and a rabbit with brown fur (BB), what will the genotype and phenotype be? (p.181) Genotype: **4 Bb** Phenotype: **4 BROWN**
8. If you cross two hybrid rabbits (Bb), what will the genotype and phenotype be? (p.181) Genotype: **1 BB, 2 Bb, 1 bb** Phenotype: **3 BROWN, 1WHITE**
9. The genetic material (hereditary information) of living things is called **DNA** and is found in the **NUCLEUS** of a cell. (p.188 & 117)
10. Humans have **23** pairs of chromosomes (or **46** total). (p.188)
11. DNA has a **DOUBLE-HELIX** shape. (p.210)

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12. What are the 3 parts that make up DNA: **SUGAR, PHOSPHATE** and a **BASE** There are **4** possible bases for DNA: **ADENINE, THYMINE, GUANINE, CYTOSINE**. The bases pair up with the same partner each time: **A** pairs with **T** and **C** pairs with **G** (p.208 & 210)
13. What is a mutagen? What are some examples of mutagens? (p.216) **A MUTATION IS A CHANGE IN THE ORDER OF THE BASES OF DNA. A MUTAGEN IS SOMETHING THAT CAUSES A MUTATION. EX: X-RAYS, UV RAYS, ASBESTOS, AIR POLLUTION, CHEMICALS IN CIGARETTES**

When DNA mutates, it is generally fixed by the **REPAIR ENZYMES**.

Standard 3: Evolution (Chapter 10, pgs 297-317)

1. What did Darwin propose was the mechanism for evolution? (p.310) **NATURAL SELECTION**
2. What are the four steps of Natural Selection? (p.310 diagram)
 - a. **OVERPRODUCTION**
 - b. **GENETIC VARIATION**
 - c. **STRUGGLE TO SURVIVE**
 - d. **SUCCESSFUL REPRODUCTION**
3. When individuals in a population are slightly different, we call this **GENETIC VARIATION**. (p.312)
4. How can geographic separation lead to speciation (the forming of new species)? (p.314-315) **IF MEMBERS OF THE SAME SPECIES ARE SEPARATED FOR VERY LONG PERIODS OF PERMANENTLY, THEY CAN CHANGE GENETICALLY IN RESPONSE TO DIFFERENT ENVIRONMENTS AND EVENTUALLY BE DIFFERENT ENOUGH TO LACK THE ABILITY TO INTERBREED. THIS WOULD RESULT IN THE FORMING OF TWO DIFFERENT SPECIES.**
5. What evidence do we have from the geologic record that life on Earth has changed over time? (p.309) **THE GEOL. RECORD SHOWS THAT LIVING THINGS HAVE CHANGED OVER TIME. IT SHOWS THAT AT FIRST LIFE WAS VERY PRIMITIVE, AND MANY SPECIES HAVE DIED OUT, AND THAT NEWER SPECIES HAVE REPLACED EXTINCT ONES.**
6. How can we use the fossil record for figuring out the relative age of fossils? (p. 246-248) **RELATIVE DATING BY LOOKING AT UNDISTURBED LAYERS OF ROCK. THE OLDEST LAYER IS ON THE BOTTOM.**
7. What method can be used to absolutely date fossils? (p. 247) **RADIOMETRIC DATING**
8. How do the similarities in the forelimb bones of humans, cats, whales, and bats support the theory of evolution? (p. 304) **THE ORGANISMS DESCENDED FROM A COMMON ANCESTOR**
9. What did Darwin think happened to the first group of finches that came to the Galapagos Islands? (p. 307) **THE FINCHES TRAVELED TO DIFFERENT ISLANDS. AFTER A LONG PERIOD OF TIME, THEIR BEAK SHAPES ADAPTED TO THE DIFFERENTED FOOD SOURCES ON DIFFERENT ISLANDS AND THE FINCHES BECAME SEPARATE SPECIES.**
10. In cladograms, organisms are closer to each other on the diagram if they have more shared **CHARACTERISTICS**. (p. 333)
11. What happens if a species cannot adapt when its environment changes drastically (a lot)? (p. 316) **THEY GO EXTINCT**
12. Which of the following is considered a vestigial structure in whales?
 - a. flippers
 - b. **HIND LEG BONES**
 - c. blow holes
 - d. eyes
13. What do we know about now that Darwin did not know about? (p. 311) **DNA OR MUTATIONS**

Standard 4: Earth and Life History (Chapter: 9, pgs 200-213)

1. How old is the Earth? (p. 276-279) **4.6 BILLION YEARS OLD**
How long has life existed on Earth? (p. 279) **3.5 BILLION YEARS**
2. What is igneous rock and how is it formed? (p. 238) **MADE FROM LAVA OR MAGMA. IT FORMS WHEN THE LAVA OR MAGMA IS COOLED**

3. What is sedimentary rock and how is it formed? (p. 238-239) **MADE WHEN PIECES OF OTHER ROCKS ARE DEPOSITED ON TOP OF ANOTHER. THEY ARE MADE THROUGH CEMENTATION AND COMPACTION**
4. What is metamorphic rock and how is it formed? (p. 238) **FORMED DEEP INSIDE THE EARTH. IT IS FORMED THROUGH HEAT AND PRESSURE**
5. What is erosion? (p. 239) **WHEN ROCK AND SOIL ARE WORN AWAY BY WATER, WIND OR GLACIERS**
6. What are possible explanations for mass extinctions? What is an example of a famous mass extinction? (p. 278) **CLIMATE CHANGE, ASTEROIDS, OR OTHER NATURAL EVENTS. DINOSAURS WENT EXTINCT 65 MILLION YEARS AGO, PERHAPS BY AN ASTERIOD**
7. What is a fossil? How are they formed? What can we learn from fossils? (p. 264-267) **TRACES OR IMPRINTS OF A ONCE LIVING THING. AN ORGANISM DIES AND IS COVERED UP BY SEDIMENT. AS THE SEDIMENT PILES UP AND IS COMPACTED, THE ORGANISM DISOLVES AND LEAVES A SPACE FOR MINERALS TO FORM A ROCK IN THE SHAPE OF THE ORGANISM. FOSSILS CAN TELL US ABOUT THE PAST.**
8. What is Pangaea? What evidence do we have that Pangaea existed? (p. 272-273) **PANGAEA WAS A LARGE LANDMASS THAT WAS MADE OF ALL THE CONTINENTS. THE CONTINENTS SEEMS TO FIT TOGETHER. FOSSILS, GLACIAL PATTERS, AND MINERALS DEPOSITS ALSO MATCH ON ONCE ADJOINING CONTINENTS.**
9. What is the theory of plate tectonics? (p. 270-272) **THERE ARE PLATES THAT MAKE UP THE EARTH'S CURST. THESE PLATES MOVE AROUND ON THE MANTLE MOVING THE PLACES OF THE CONTINENTS OVER A LONG PERIOD OF TIME.**
10. How did ocean fossils found on mountaintops get there? **THE FOSSILS WERE ON A PLATE THAT WAS UPLIFTED INTO THE MOUNTIANS FROM A PLACE THAT WAS ONCE COVERED BY OCEAN.**
11. Potassium has a half-life of 1,200,000,000 years. How much potassium will be left after 3,600,000,000 years? (p.247) **1/8 OF THE POTASSIUM WILL BE LEFT**

Standard 5: Structure and Function in Living Systems (Chapter 11, pgs 332-343)

1. Organisms are made up of one or more **CELLS** which combine to make **TISSUES** which combine to make **ORGANS** which combine to make **ORGAN SYSTEMS** (p. 132)
2. Name the 2 parts that make up the stamen. (p. 380) **ANTHER FILAMENT**
Are they male or female? **MALE**
3. Name the 3 parts that make up the pistil. (p. 380) **STIGMA STYLE OVARY**
Are they male or female? **FEMALE**
4. What are the structures called that produce pollen? (p. 380) **ANTHERS**
5. Is the pupil an anatomical structure? How does it get bigger and smaller? (p.536) **NO, IT IS A HOLE THAT LETS LIGHT IN. IT GETS BIGGER AND SMALLER TO LET IN MORE OR LESS LIGHT.**
6. How does your eye focus? (p.537) **THE LENS CHANGES SHAPE TO FOCUS THE LIGHT ON THE RETINA**

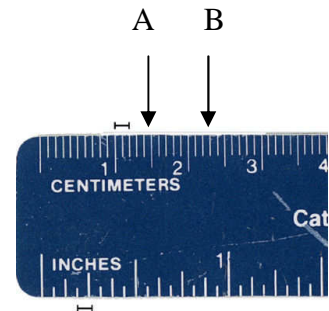
Standard 6: Physical Principles in Living Systems (Chapter 3, pgs 54-67)

1. How do we see things? (Explain using how light works.) (p. 536) **LIGHT REFLECTS OFF OBJECTS AND INTO OUR EYES**
2. Light travels in **STRAIGHT** lines except when **REFRACTED-CHANGE IN MEDIUM** (p. 90)
3. Angle of **INCIDENCE** is equal to the angle of **REFRACTION** (p. 82)

- Why do limes appear green? (p. 86) **ALL COLORS EXCEPT GREEN ARE ABSORBED, GREEN IS REFLECTED**
- What is the relationship between frequency and wavelength? (p. 77) **THE LONGER THE WAVELENGTH, THE LOWER THE FREQUENCY, THE SHORTER THE WAVELENGTH, THE HIGHER THE FREQUENCY**
- How are waves classified or organized in the EM Spectrum? (p. 77) **WAVELENGTH AND FREQUENCY (ENERGY)**
- What types of waves have the most energy? What types of waves have the least energy? (p. 77) **HIGH: GAMMA RAY, X-RAY, UV RAYS. LOW: RADIO, MICROWAVE, INFRARED**
- How are rainbows formed? What happens when white light shines through a prism? (p. 91) **WHITE LIGHT IS REFRACTED INTO THE COLORS WHEN IT HITS WATER OR A PRISM**
- As you look through a compound microscope with an eyepiece magnification of 10x and an objective magnification of 20x, what is the total magnification? (p. 618) **10x X 20x = 200x**

Standard 7: Investigation and Experimentation (Appendix, pgs 612-618)

- How many centimeters are there in 10 meters? (p. 616) **1000cm**
- How many millimeters are there in 2 centimeters? (p. 616) **20mm**
- What is the measurement at point A? **1.5cm or 15 mm**
- What is the measurement at point B? **2.3cm or 23mm**
- How many millimeters are in one centimeter? (p. 616) **10mm**
- Name the 2 focus knobs on a microscope. Which one do you focus first? (p. 618) **FINE AND COARSE FOCUS KNOB. USE THE COARSE FOCUS KNOB FIRST**
- What objective do you use when first looking at a slide under the microscope? (p. 618) **LOW POWER**
- Name the 6 steps of the Scientific Method. (p. 612-614) **CREATE A QUESTION, FORM A HYPOTHESIS, TEST THE HYPOTHESIS, ANALYZE THE DATA, DRAW CONCLUSIONS, COMMUNICATE THE RESULTS**



- In what quarter did the Lakers score the most points? **FOURTH**
- Between which quarters was the greatest decrease in points for the Timberwolves? **SECOND AND THIRD**
- Between which quarters was there the greatest increase in points for the Lakers? **THIRD AND FOURTH**
- In first half, what was the average score for the Lakers per quarter? **??**

