

Suspended Animations

Measurement **Lab Summary Questions**

1. There are two kinds of fractions. Name them and give an example of each.
2. Define *percent*.
3. Why is it important to understand the metric system of measurement?
4. What is the significance of the decimal point in metric calculations?
5. Define *centi*, *milli*, and *kilo*.
6. What are the metric standards for measuring length, volume, and weight?
7. What are the English equivalents of measurement for the above metric standards?
8. What is your height and weight in metric measurement?

Suspended Animations

Microscope Lab Summary Questions

1. Discuss the significance of the invention of the microscope.
2. How do you calculate the total magnification of an object being viewed through the microscope?
3. In a multi-layered object viewed through the microscope, how can you tell which layer is on top?
4. What are the diameters of the fields of view for the different magnifications of your microscope?

low magnification at _____ X = _____ mm diameter
medium magnification at _____ X = _____ mm diameter
high magnification at _____ X = _____ mm diameter
5. Explain how to estimate the size of an object when viewed under the microscope.
6. Explain how you switch from one magnification to another magnification and still keep the same object in your field of view.

Suspended Animations

Cells

Lab Summary Questions

1. Discuss the Cell Law and explain why its discovery was so important.
2. How big is a human cheek cell compared to the dot over the letter “i”? (State your answer as a percent of the diameter.) _____
3. How do you know whether a cell is eukaryotic?
4. How long in mm is a typical onion cell? _____
5. How many layers of cells are in the *Elodea* leaf? _____
6. Which layer of the *Elodea* leaf has thick-walled cells?
7. Where are color pigments located in the cells of plants? Illustrate your answers.

8. What are the stomata, where are they found, and how are they important?

Suspended Animations

Chemistry Concepts **Lab Summary Questions**

1. Why is an understanding of chemistry important?
2. Discuss the difference between element, atom, and molecule.
3. The Atomic Number is the number of _____ in an atom.
4. The Atomic Mass is the number of _____ in an atom.
5. The number of protons in an element also equals the number of _____ .
6. Isotopes have different numbers of _____. Why are isotopes important?
7. Ions have different numbers of _____. Why are ions important?
8. How many atoms of Group I would react with one atom of Group V?
9. How many atoms of Boron (B) would react with how many atoms of Sulfur (S)?
(Hint: check their group numbers.)

Suspended Animations

Chemistry Capers Lab Summary Questions

1. Describe the hydrogen bond in water.
2. How is the hydrogen bond related to cohesion, adhesion, and capillarity?
3. What happens to the hydrogen bonds when water is boiled (evaporated)?
4. What is pH?
5. Why is pH important to living organisms?

Suspended Animations

Enzymes

Lab Summary Questions

1. What kind of molecule is an enzyme?
2. What is the key feature responsible for enzyme activity?
3. Discuss how enzymes are related to the “energy of activation” in a chemical reaction.
4. What is an experimental “control,” and why must it be included in all experiments?
5. What effect does overheating have on the potato enzyme?
6. What could happen if an animal’s enzymes became overheated in a desert climate?
7. What effect does an acid solution have on the potato enzyme?
8. What effect could excess acidity in the soil or rain have on the enzymes of living organisms?

Suspended Animations

Photosynthesis Lab Summary Questions

1. Write the equation for photosynthesis both in words and using chemical formulas.
2. Light energy is converted first into energy which is then used to make _____ .
3. Discuss how chromatography works.
4. How many different leaf pigments did you separate in the spinach juice experiment?
5. When plants in the light with yellow phenol solution turned the solution red with time, what substance was being absorbed by that plant?
6. How big of a plant did you calculate to be necessary to supply you with oxygen during one 24-hour day?
7. Explain what you learned about CO₂ absorption, oxygen creation, and how plants relate to the overall health of living organisms, the ecosystem, and the planet.

Suspended Animations

Respiration Lab Summary Questions

1. Write the equation for respiration.
2. What is an endotherm? Give two examples.
3. What is an ectotherm? Give three examples.
4. Describe the differences in metabolic rate of ectotherms and endotherms at different environmental temperatures.
5. Do plants do respiration?
How do you know?

Suspended Animations

Sameness and Variety **Lab Summary Questions**

1. Define *mitosis* and *meiosis*.
2. Explain why living organisms need both.
3. In all cases, is it you or your DNA that reproduces? _____ Explain.
4. Define *homologous pairs*.
5. Write a one sentence description of each phase of mitosis: prophase, metaphase, anaphase, and telophase.
6. Define *synapsis*.
7. Define *crossing-over* and explain how “new mixes” are created from parent chromosomes.
8. Discuss how independent assortment and random fusion create genetic variety in offspring.

Suspended Animations

Genetics

Lab Summary Questions

1. What are three ways that an understanding of genetics will benefit your life?
2. Define *genetics*.
3. Define *allele*.
4. Define *homozygous* and *heterozygous*.
5. Define *genotype* and *phenotype*.
6. Define *dominant* and *recessive*.

Suspended Animations

Surrounded by Microbes **Lab Summary Questions**

1. Where are microbes found?
2. Briefly describe how to sample for bacteria.
3. Why are plates of sampled bacteria potentially very dangerous?
4. Define *prokaryotic* and *eukaryotic*.
5. Define *unicellular* and *multicellular*.

Suspended Animations

Mosses and Ferns Lab Summary Questions

1. What traits were needed by early land plants?
2. What traits did algae already have before land plants developed?
3. Which stage works best on land—haploid or diploid?
4. Which stage is the dominant phase in the lifecycle of mosses?
5. Which stage is the dominant phase in the lifecycle of ferns?
6. Where do you find the sex organs of the moss plant?
7. Where do you find the sex organs of the fern plant?
8. Where are the spores produced in the moss plant?
9. Where are the spores produced in the fern plant?
10. What features of the fern plants allow them to grow so much larger than the mosses? Explain.
11. Why do both mosses and ferns require wet environments for the survival of their species?

Suspended Animations

Dry Land Plants Lab Summary Questions

1. Which stage in the lifecycle of ferns is particularly vulnerable to dry conditions on land?
2. Which stage is the dominant phase in the lifecycle of conifers and flowering plants?
3. Where do you find the gametophyte generations in the conifers? Is that a protection of the gametophyte?
4. Where do you find the gametophyte generation in the flowering plants? Is that a protection of the gametophyte?
5. Which generation is the pollen?
6. Stamens are the (male or female) organs in the flower?
7. Pistils are the (male or female) organs in the flower?

Suspended Animations

Survey of Animals **Lab Summary Questions**

1. The oldest fossils of multicellular animals are about how old?
2. Animals without a backbone are called _____.
3. Give an animal example of each of the three basic body plans: no symmetry, radial symmetry, and bilateral symmetry.

4. Give an example of an animal with incomplete gut.

5. What is the advantage of a complete gut?

6. What is segmentation?

7. Which animal group is the most successful animal, and also has an exoskeleton?

8. What is the main advantage of the endoskeleton.

9. What two improvements over the amphibians allowed the reptiles to have greater success on land?

Suspended Animations

Human Evolution Lab Summary Questions

1. What is meant by the “Mitochondrial DNA Clock,” and how is it used to compare ancestral groups of humans?
2. What happens to the DNA of two groups of humans once they become reproductively isolated from each other?
3. What happens to the DNA of one group of humans that remains geographically isolated from all other groups for a long period of time?
4. Where did humans originate on this planet? Discuss the evidence you have to support your answer.
5. Define, and describe the differences between *Australopithecus*, *Homo habilis*, and *Homo erectus*.

Suspended Animations

Embryology Lab Summary Questions

1. How does an embryo differ from a fetus?
2. What is meant by the phrase “ontogeny recapitulates phylogeny?”
3. During which days of the menstrual cycle would you expect:
immature egg _____
ovulation _____
corpus luteum _____
shedding of endometrium _____
4. Discuss the differences between the developmental stages of male and female reproductive systems (eggs and sperm) in the fetus and at puberty.
5. If the female eggs are damaged by environmental factors, can they return to normal over time?

Suspended Animations

The Heart

Lab Summary Questions

1. Describe the circulation of blood through the heart including how the blood reaches the lungs and the rest of the body.
2. What structures ensure that blood flows only in one direction through the heart? Explain how they operate.
3. Heart sounds are most closely associated with . . .
4. On average, if a person has a heart rate that is elevated 20% beyond normal, about how much reduction in longevity would be expected?
5. Name and describe the two blood pressure readings measured using a stethoscope.
6. What is collateral circulation?
7. Discuss the role of cholesterol, arteriosclerosis, and clots on circulation.
8. What function is being recorded in each part of an EKG: P wave, QRS wave, and T wave?

Suspended Animations

Senses and Perception **Lab Summary Questions**

1. Discuss the differences between senses and perception.
2. Discuss the relationship between two-point discrimination and the density of touch receptors.
3. Does your body detect actual temperature or a change in temperature?
4. Name the basic parts of your ear, and tell how each part works to allow you to hear sounds.
5. How can you test whether a person has hearing loss due to middle-ear damage or nerve damage?

Suspended Animations

Photosynthesis and Respiration Lab Summary Questions

1. What is the First Law of Thermodynamics?
2. What is the Second Law of Thermodynamics?
3. Within an ecosystem, approximately what percent of sunlight energy is converted into plants?
4. Within an ecosystem, from the plant energy conversion onward, what is the percent of each subsequent energy conversion?
5. Write the equation for photosynthesis.

Suspended Animations

Biotechnology: DNA **Lab Summary Questions**

1. Do identical twins have identical fingerprints?
2. How about their DNA “fingerprints”?
3. What is PCR?
4. Restriction enzymes cut what molecule?
5. How do the recognition sites (for restriction enzymes) differ from person to person?
6. Define *gel electrophoresis*.
7. What is the purpose of a genetic probe (either radioactive or fluorescent)?
8. Define *recombinant DNA*.

