Name Key

Study Guide Quarter 1

Safety

1. What piece of lab equipment is very important for safety in many science labs?
   Safety goggles
2. What do you never do to a test tube when heating it? (2 things)
   Never stopper the test tube, do not point it at yourself or anyone else.
3. If you get hurt or equipment is broken what should you do?
   Tell the teacher

Lab Skills

4. To measure the volume of a liquid what tool do you use and where do you read from? Graduated cylinder, read from the bottom of the meniscus.
5. Know the metric prefixes in order and be able to convert!
   K H D U D C M
6. Why do we add stains to slides?
   To make cell parts more visible
7. What is one down side of staining cells?
   Kills the specimen
8. What technique is used to compare the DNA of different organisms? (used in things like crime scene investigations) Gel Electrophoresis

9. Why do we add a coverslip to a slide?
   To protect the specimen + hold it in place.
   * We put the coverslip on at a 45° angle to prevent air bubbles from forming. *
10. How does a centrifuge separate mixtures?
    By density when spun.
11. Why do we use paper chromatography?
    To separate a mixture (pigments)
12. Why do we use indicators?
    To show the presence of a specific molecule.
13. What does iodine indicate the presence of? Tell me about the color change.
    Iodine goes from amber to purple/black in the presence of starch
14. What does Benedict's solution indicate the presence of? Tell me about what additional step is needed and the color change.
    Benedicts blue goes from blue to brick orange when in the presence of glucose and heated!

15. Dichotomous Keys are used to identify organisms that are unknown to the used but known to the classification system. Make sure you know how to use a dichotomous key. Always goes between 2 characteristics (physical). Starts off general and becomes specific.

16. Know the parts of the microscope. In class we use what kind of microscope?
Compound light microscope (has 2 lenses, ocular (eyepiece) + objective)

17. How do you find the total magnification of a microscope?
Total Magnification = Ocular magnification x Objective magnificatio

18. What do you never use under high power?
The coarse adjustment knob - it can crack the slide or scratch the objective lens

19. How do objects appear under the microscope? (tell me and draw me a picture)
upside down, backwards + magnified e

20. What does the diaphragm control?
The amount of light on the specimen.

21. The most powerful kind of microscope is the
The electron microscope

Scientific Method

22. What are the steps of the scientific method?
Purpose as a question, background research, hypothesis, design + carry out experimen
Analyze data, draw conclusions, share results.

23. How many variables are we looking to test?
Only 1 - the Independent variable

24. What is the independent and dependent variable?
Independent variable - what "I" the scientist changes
Dependent variable

25. How are the experimental and control group different? (make sure you can apply this to an experiment knowing which group would be the control group)
Experimental group gets the variable
Control group is kept closest to natural conditions

26. Why is a control group necessary in an experiment?
For comparison

27. Making a prediction of what you expect the results to be is making a what? It does not need to be correct.
Hypothesis - it can be supported or refuted by your data.

28. The information that we collect during an experiment (observations and measurements) is what?
Data

29. How do we organize data?
Tables, charts and graphs.

30. What do we form after looking at the data from the entire experiment?
Conclusions
31. How do you make an experiment more reliable increase validity? (tell me 2 ways)
Repeat the experiment, increase sample size
32. What are constants in an experiment?
Things that are kept the same in both groups (control + experimental)

Graphing

33. Make sure to include labels with units for each scale!
34. Independent variable is on the x-axis and dependent variable is on the y-axis.
35. Surround plot points with a circle, triangle, whatever is asked for and then connect the points.
36. DO NOT extend the line to (0,0) the origin (unless it is a given data point) or past the last given data point.
37. Make sure the scale value is equal all throughout each scale

Life Functions

38. List the organization of life from least complex to most complex?
Cell → tissue → organ → system → organism
39. What are the 8 life functions?
See 40 - life process. 3 R GENTS
40. Know the function of each of the life functions as well as which organelles are associated with the process.

Life Process	Definition	Organelle
* Respiration	Create Energy	Mitochondria
Regulation	Control + Coordination	Cell Membrane, Nucleus, Cytoplasm
Reproduction	Make more of oneself	Cell Membrane, Nucleus, Centriole
Growth	Increase in size or # of cells	Cell Membrane Cytoplasm
Excretion	Getting rid of cell wastes	Cell Membrane
Nutrition	Taking things from the environment + getting them to a useable form	Lysosome, Chloroplast (plant only) Vacuole
Transport	Movement/Circulation of materials	Cytoplasm ER Cell Membrane
Synthesis	Making something more complex from less complex	Ribosome Chloroplast (plants only)

41. Be prepare to explain how the life processes work together. For example, digestion releases nutrients from food (nutrition), which are then absorbed and circulated to cells (transport). They then diffuse, or move, into cells where they are used to create energy (respiration) or to synthesize (synthesis) molecules that the cell needs. All of the metabolic activities then lead to wastes that must be removed (excretion).

42. What is metabolism?

The sum of all the life functions / chemical reactions

43. What is homeostasis?

Keeping the internal environment stable even when the external environment is changing

Cells

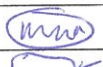
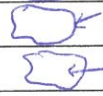
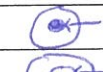
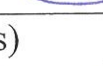
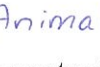
44. What are the 3 parts of the cells theory?

All living things are composed of one or more cells. Cells are the basic unit of structure and organization of organisms. Cells arise from pre-existing cells

45. Why are viruses an exception to the cell theory?

Cannot reproduce on their own

46. Organelles

Cell Organelle	Function	Picture
Mitochondria	Cellular respiration - make ATP energy	
Cell membrane	Controls what enters + exits a cell	
Cytoplasm	Movement within a cell	
Ribosome	Protein Synthesis	
Nucleus	Control center of cell, contains DNA	
Vacuole	Stores food, water + wastes	
Chloroplast (plant cells only)	Site of photosynthesis	

47. How are plant and animal cells different? (list at least 3 reasons)

Plant cells have a cell wall and chloroplasts Animal cells have centrioles

48. How do the different organelles work together to maintain homeostasis?

49. Compare how cell organelles are similar to organs.