

Biology Fall Final Exam Study Guide

Classification:

1. What are the differences between prokaryotes and eukaryotes?

No nucleus

nucleus

2. What are the kingdoms under domain Prokarya? Domain Eukarya?

Prokarya: Archae, Bacteria

Eukarya: Plants, Animals, Protists, Fungi

3. What is binomial nomenclature? **2 name classification**

4. What is the first name in binomial nomenclature identifying?

Genus

5. What is the second name in binomial nomenclature identifying?

species

6. List the 7 levels of hierarchy in order of least specific to most specific.

KPCOFGS (<https://www.youtube.com/watch?v=6jAGOibTMuU>)

7. What is the defining characteristic for vertebrates? **Spine**

8. What is homeostasis? **Maintain internal environment**

9. What are the 3 statements of the cell theory?

1. All life made of cells 2. Cells smallest unit of life

3. Cells come from cells

10. Are viruses living or non-living? Why? **No – not char of life**

11. List the levels of organization in order

Atom, molecule, organelle, cells, tissues, organ, organ systems,

organism, population, community, ecosystem, biosphere

12. What are the 8 characteristics of life?

Cells, Reproduction, Metabolism, Homeostasis, Heredity,

Plants:

13. What is the role of stomata? What do they allow in and out of the cell?

Gas exchange

14. What is the function of a guard cell? **Opens/closes stomata**

15. What happens if stomata are closed?

No gas = no photosynthesis

16. What is transpiration? **Water moves through plant**

17. What properties allow for water to be transported in a plant?

Adhesion & cohesion

18. What is the process of capillary action? **Water climbing tube**

19. What do each of the parts of a seed embryo do? *See diagram*

20. Compare monocots and dicots. **Monocot – simple (grasses)**

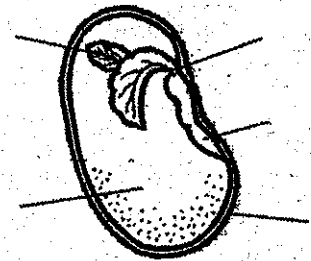
Dicot – complex (trees)

21. Why do plants look green to us? **Reflect green, absorb blue & red**

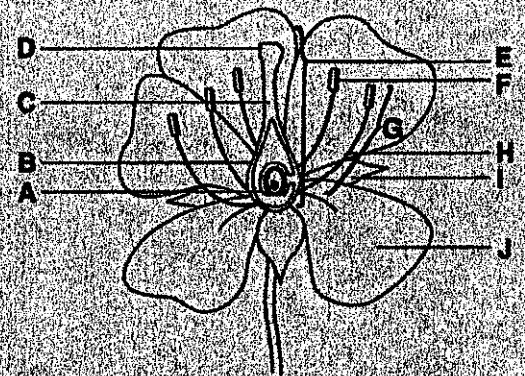
22. Label the parts of a flower in the image.

23. What is the role of each of these parts?

- **Stem: support plant**
- **Petals: attract pollinator**
- **Ovary: becomes fruit, holds seeds**
- **Anther: makes pollen**
- **Pollen: fertilizes ovule to make seed**
- **Roots: anchors plant**
- **Leaves: Photosynthesis**



Bean seed (dicot)



•—Stem:

- Xylem: carries water ↑ the plant
- Phloem: carries sugar ↓ the plant

24. Describe the difference between pollination, fertilization and seed dispersal. **P: pollen lands on stigma F: ovule becomes seed SD: seed moves away**

25. What are the functions of the root, stem and leaves?

Photosynthesis:

26. What do plants use pigments for? **Absorb energy**

27. Where does photosynthesis take place? (what organelle) **chloroplast**

28. Why do leaves turn color in the fall? **Chlorophyll dies**

29. Where do the light dependent reactions take place? **Thylakoid membrane**

30. Where does the Calvin Cycle take place? **Stroma**

31. What are the reactants and products of the light dependent reactions?



32. What are the reactants and products of the Calvin Cycle?



33. What is the balanced equation for photosynthesis?



34. Relate the products of the light-dependent reactions to the products of the light-independent reactions. **ATP used for glucose production**

35. Draw and label a graph for each of 3 factors that affect photosynthesis.

Carbohydrates:

36. What elements are found in carbohydrates? **CHO**

37. What is the function of carbohydrates? **Provide energy**

38. What is a monomer? **Single unit**

39. What is the monomer of carbohydrates? **monosaccharide**

40. What are the 3 classes of carbohydrates? Give an example of each type.

Monosaccharide: glucose

Dissacharide: lactose

Polysaccharide: starch, chitin

41. What disease is caused by the inability to remove glucose from the blood? **Diabetes**

42. What hormone is responsible for removing glucose from the blood? **Insulin**

43. What hormone is responsible from raising blood glucose levels? **Glucagon**

44. Compare Type I and Type II diabetes.

Type I: born with Type II: from diet/obesity/genetics

45. What is glycogen? **Sugar stored by liver**

46. What shape would you classify carbohydrates having? **Ring**

47. What is the process of joining two monosaccharides together called? **Dehydration synthesis**

48. What is the process of breaking apart a disaccharide called? **hydrolysis**

49. What causes lactose intolerance? **Lack of lactase enzyme**

50. Iodine is an indicator for what? **starch**

Cellular Respiration:

51. What is the balanced equation for cellular respiration?



52. What is cellular respiration? **Sugar breaking down to produce energy (ATP)**

53. What are the 3 major phases of cellular respiration? **Glycolysis, Krebs Cycle, Electron Transport**

54. Define aerobic and anaerobic. **Aerobic: uses oxygen Anaerobic: no oxygen**

55. What process do cells undergo in anaerobic conditions? **fermentation**

56. What is NAD+? **Electron carrier**

57. Where does the electron transport chain get the high energy electrons that move down the chain?

Hydrogen

58. What is the energy from the electrons in the ETC used for? **Produce 34 ATP**

59. How many total ATPs are produced during cellular respiration? **38 ATP**

60. How does oxygen contribute to the production of ATP? **accepting "spent" hydrogens to form water**

61. Why do cells need to undergo fermentation to make energy if glycolysis doesn't require oxygen? **To get additional ATP**

62. How many ATPs can be made in each step of cellular respiration? **Glycolysis = 2 ATP, Krebs = 2 ATP, ETC = 34 ATP**

63. What are the two types of fermentation? Where do they take place? **Lactic Acid and Alcoholic, in cytoplasm**

64. When cells need energy they get it from ATP by removing a phosphate group. What new molecule is formed? **ADP**

65. Recap the snail and elodea lab. What gas did the snails release? What gas did the elodea release? How did this effect the levels of carbon dioxide? **Snails → CO₂ → Elodea → O₂**

Inertia, Force and Acceleration for an Automobile Passenger

The idea expressed by Newton's law of inertia should not be surprising to us. We experience this phenomenon of inertia nearly every day when we drive our automobile. For example, imagine that you are a passenger in a car at a traffic light. The light turns green and the driver accelerates from rest. The car begins to accelerate forward, yet relative to the seat which you are on your body begins to lean backwards. Your body being at rest tends to stay at rest. This is one aspect of the law of inertia - "objects at rest tend to stay at rest." As the wheels of the car spin to generate a forward force upon the car and cause a forward acceleration, your body tends to stay in place. It certainly might seem to you as though your body were experiencing a backwards force causing it to accelerate backwards. Yet you would have a difficult time identifying such a backwards force on your body. Indeed there isn't one. The feeling of being thrown backwards is merely the tendency of your body to resist the acceleration and to remain in its state of rest. The car is accelerating out from under your body, leaving you with the false feeling of being pushed backwards.

Now imagine that you are in the same car moving along at a constant speed approaching a stoplight. The driver applies the brakes, the wheels of the car lock, and the car begins to skid to a stop. There is a backwards force upon the forward moving car and subsequently a backwards acceleration on the car. However, your body, being in motion, tends to continue in motion while the car is skidding to a stop. The feeling of being thrown forwards is merely the tendency of your body to resist the deceleration and to remain in its state of forward motion.

Suppose that on the next part of your travels the driver of the car makes a sharp turn to the left at constant speed. During the turn, the car travels in a circular-type path.

The friction force acting upon the turned wheels of the car causes an unbalanced force upon the car and a subsequent acceleration. The unbalanced force and the acceleration are both directed towards the center of the circle about which the car is turning.

Your body however is in motion and tends to stay in motion. It is the inertia of your body - the tendency to resist acceleration - that causes it to continue in its forward motion.

While the car is accelerating inward, you continue in a straight line. If you are sitting on the passenger side of the car, then eventually the outside door of the car will hit you as the car turns inward.

This phenomenon might cause you to think that you are being accelerated outwards away from the center of the circle. **In reality, you are continuing in your straight-line inertial path tangent to the circle while the car is accelerating out from under you.**

The sensation of an outward force and an outward acceleration is a *false* sensation. There is no physical object capable of pushing you outwards. You are merely experiencing the tendency of your body to continue in its path tangent to the circular path along which the car is turning. You are once more left with the false feeling of being pushed in a direction that is opposite your acceleration.

