

Tips for success-

1. HANDWRITE out your study guide. Some (very few) students do fine with typing, but most do much better when they handwrite their study guide. If you do a really complete job, your study guide will be 8-15 pages long, depending on the size of your handwriting.
2. WORK IN GROUPS, but don't split up the parts among people in a group. The benefits of doing the study guide are gained from actually writing out the answers yourself. It's great to work in groups and discuss the answers with others, but be sure you do your own writing. Besides, if I see exact copies of study guides, no one in the group will get the extra credit for it.
3. Draw yourself diagrams and pictures whenever you can, to illustrate processes. You can redraw the pictures for yourself on your exam and use them as models to answer questions. If you can, create a little "movie" in your head of cellular processes.
4. Focus on learning **processes** rather than just definitions whenever applicable. For example, for the vocabulary term below-"photosynthesis" you should not stop at defining it, but should be sure that you understand what kinds of organism do it, what kind of environmental conditions are required, how the process works, what are the reactants and products, etc.
5. Get a good night's sleep and eat a good breakfast before the exam. An extra hour of sleep will be more valuable than an extra hour of studying if you are exhausted. If you find yourself in this predicament often, then you need to start studying much earlier for the exam. Allow 10-20 hours of total study time for each exam. Whether you do it all at once or in small increments is up to you...

GOOD LUCK!!

Sexually Transmitted Diseases

1. A. List the three major groups of STD's and give some examples of each. B. Which groups are curable and which are not? C. Are any of these fatal if caught?
2. A. For each of the following STDs, describe how it is transmitted, the symptoms, the causative agent, the treatments/cures (if any): Chlamydia, gonorrhea, syphilis, *trychomonas*, crabs, Human Papilloma Virus, HIV and Herpes.

Cell division- Mitosis:

1. In your own words, define cellular division. What is the purpose of cellular division in single celled organisms? in higher animals? What two types of cell division have we learned about?
2. Define in your own words the following terms (use drawings to help explain): chromatin, chromosome, sister chromatid, centromere, homologous chromosomes (or homologues) Do sister chromatids carry identical genetic information? Do homologous chromosomes?

3. Describe the relationship between autosomes (somatic chromosomes), sex chromosomes, somatic cells and sex cells. Describe the terms diploid (2N) and haploid (N) in relation to the types of cells above.
4. What is the cell cycle all about or what does it show? (briefly) Draw a simplified illustration of the cell cycle using only the words interphase, and mitosis. What is the longest phase of the cell cycle? This phase is divided up into three distinct stages. What are they and describe briefly what happens in each. Why must DNA replicate prior to mitosis and exactly when does this occur? What is cytokinesis and when does it occur?
5. What is the purpose of mitosis? Mitosis has four distinct stages. What are they and describe what happens in each stage.
6. If a cell has 13 chromosomes as a haploid cell, how many chromosomes are found in the diploid cell of the same organism? If a somatic cell has 30 chromosomes, how many are in the gametes? A gamete has 8 chromosomes, is this the N or 2N number? and, how many chromosomes then, are in the somatic cells? If a somatic cell has 24 chromosomes, how many homologues are there? What is the haploid and diploid number of chromosomes in humans?
7. What is the purpose of meiosis in higher animal such as humans? Why is this also called reduction division? Does the DNA replicate during the S stage of interphase prior to meiosis just like it does in mitosis forming sister chromatids?
8. Meiosis is broken into two large divisions: meiosis I and meiosis II. Name the stages within each of those large divisions. What is crossing over? When does it occur in meiosis? What is the significance of crossing over? Describe how the separation of chromosomes is different in Anaphase I and Anaphase II.
9. How is the outcome of mitosis different from meiosis in cell number and chromosome number? If a cell has 32 chromosomes and undergoes meiosis, how many chromosomes would be found in each daughter cell? What if the original cell undergoes mitosis?

Define the following terms related to *cell division*:

DNA	Tetrads	Gametes
Chromosomes	Centrioles	Independent assortment
Chromatin	Microtubules/spindle fibers	Random fertilization
Chromatid	Metaphase plate	Nondisjunction
Homologous chromosome	Genome	Trisomy 21
Duplicated chromosome	Karyotype	Cri du chat syndrome
Centromere	Nuclear envelope	Fragile X syndrome
Gonads		

Heredity-Mendelian Genetics:

10. Who was Gregor Mendel? What organism did he use in his study? What is meant by Mendelian Inheritance?
11. When doing a punnett square, what do the letters outside of the box represent and where do they come from (be specific)? If a parent is homozygous dominant for a trait, how many different kinds of gametes can (s)he make? Give an example If the parent is homozygous recessive ...? Example? If the parent is heterozygous ...? Example? What do the letters inside the box represent (be specific)?
12. Show a cross using the following information: L = long wings, l = short wings Show the punnett square and give the genotypic and phenotypic outcomes of the offspring.
13. Explain Mendel's principle of segregation: to help illustrate your point give an example.
14. Explain Mendel's principle of independent assortment: to help illustrate your point, give an example.
15. Distinguish between complete dominance, co-dominance and incomplete dominance.
16. Human blood groups have which two types of dominance? Explain/show how this works.
17. What is meant by multiple alleles? Give an example If a man of blood type B and a woman of blood type A have children, show (by punnett square) how they could have children of all blood phenotypes (A, B, AB and O).
18. What is meant by Polygenic Inheritance? b. Give an example of a human trait that is governed by polygenic inheritance.
19. What are sex-linked traits? What are X-linked traits? Give some examples. Which sex is generally affected in a greater percentage?
20. If a colorblind male marries a carrier female, what are the chances that their children will be color-blind?
21. What is meant by an "autosomal recessive trait"? What is meant by an "autosomal dominant trait"?

Define the following terms related to mendelian genetics:

gene	recessive allele	homozygous recessive
allele	phenotype	heterozygous/hybrid
dominant allele	genotype	homozygous dominant

Molecular Biology:

22. What is the monomer unit of DNA and what are its three parts? Draw a DNA nucleotide. What is the shape of a DNA molecule? What makes up the sides of the "ladder"? What makes up the steps of the "ladder"? Where in the cell is DNA found? Diagram a short section of DNA with six bases on one side. (use each possible base at least once)
23. What is the monomer unit of RNA and what are its three parts? What is the shape of an RNA molecule? Where in the cell can RNA be found? What are the three different types of RNA studied? Diagram a short section of RNA with six bases. (use each possible base at least once)
24. Name a few differences (physical and/or functional) between DNA and RNA.
25. What is the overall purpose of DNA replication? During which stage (specifically) of the cell cycle does DNA replication occur?
26. In your own words, what are the basic steps in DNA replication. Where in the cell does DNA replication occur? Describe what is meant by "semi-conservative" replication. How could semi-conservative replication provide an advantage to the cell?
27. What does the term "gene expression" mean? What are the two major steps involved in protein synthesis? Must DNA replication occur in order for an individual cell to make proteins?
28. In your own words, give a simplified description of what happens during transcription. Briefly outline the steps of transcription. What happens after transcription, before the mRNA strand is ready to begin translation? (Hint: use the terms intron, exon, cap, tail)
29. Why is mRNA called a template? Where does transcription occur? Why does it have to occur there? Where does the mRNA molecule move after transcription is complete?
30. A. In your own words, describe what happens during translation. Briefly outline the steps of translation: include at least the terms: mRNA, codon, ribosome, tRNA charged w/ amino acid, anticodon, polypeptide. Where in the cell does translation occur? Why does it have to occur there?
31. What is an anti-codon and on what molecule is it located? By what process are the amino acids joined together? Once a polypeptide chain is formed (primary structure) what has to happen before it can become a functional protein? Where does that occur?

32. In review, briefly explain how the master "code" for a particular protein found in the DNA, is ultimately expressed by the production of that same protein in the cytoplasm. (brief overview of protein synthesis)
33. In your own words, what is a gene mutation? What do we call things that can cause mutations in DNA? What are the two main types of DNA mutations? Which type is likely to be more damaging to the protein?