DNA Review #1 Answers

1. A nucleotide is a monomer for the macromolecule nucleic acids. The two polymers that are formed with nucleotides are joined together are DNA and RNA.
2. DNA is double stranded, has the sugar deoxyribose, and uses the nitrogen bases A, G, C and T. RNA is single stranded, has the sugar ribose, and used the nitrogen bases A, G, C and U.
3. The DNA in both prokaryotes and eukaryotes carry the genetic material for the cell. It tells the cell what to do, how to do it and when to do it. In eukaryotes the DNA is found in the nucleus whereas, in RNA the DNA is a plasmid (circular DNA) or in the cytoplasm.
4. Interphase is the longest phase of the cell cycle (it is not part of mitosis) and there are three parts to this phase. G1 which is growth, S witch is DNA replication, and G2 which is growth and mitosis preparation. The phases of mitosis are prophase (nucleus dissolves and chromosomes are formed), metaphase (chromosomes line up at the middle of the cell and spindle fibers attach at the centromere), anaphase (the sister chromatids are pulled apart to opposite ends of the cell), and telophase (cytokinesis in plants and cleavage in animals – where the cell completely breaks into two new cells. Cell wall is formed from a cell plate in plants). Pictures of all of these phases are from today’s cut and paste activity.
5. Step 1 is when helicase unzips the DNA double helix and creates two templates. Step 2 is when polymerase helps attach free floating nitrogenous bases to the templates formed in step one – always A with T and G with C. Step 3 the entire DNA strand is duplicated so that at the end of DNA replication you have two identical sets of DNA.
6. Watson and Crick determined the structure of DNA is a double helix in 1953 and won a Nobel prize for their work.
7. Do not do
8. Do not do
9. Helicase is the enzyme that unzips the DNA in DNA replication.
10. Polymerase is the enzyme that attaches the base pairs –A with T and G with C- in step 2 of DNA replication.
11. See problem 5 and the pink sheet of paper we created.
12. Base pairing is when you match up nitrogenous bases in the following pattern – A with T and G with C.
13. Humans have 23 pairs of chromosomes or a total of 46. Bacteria has 1 chromosome, some ferns have over 400, and a fruit fly has 4.
14. The Human Genome project was when scientists mapped out the entire base pairs of the human body, which identified and mapped out all of the human genes. It is important because it has allowed scientists to understand chromosomal abnormalities more and provide better treatment.
15. DNA matching strand: TATCCGAGCTAAGGTCA

RNA matching strand: UAUCCGAGCUAAGGUCA

1. Polymerase is the enzyme that attaches all the nitrogenous bases, A with T and G with C so it technically proofreads the DNA strand when it attaches the correct base.