1. Linked genes are located on the same chromosome and unless crossing over occurred between the genes, they are inherited together. Non-linked genes are on different chromosomes
   1. Note: Sex-linked genes are genes located on the X-Chromosome and are therefore associated with gender.
2. 46, 47 (Trisomy 21)
3. Law of dominance: One from the pair of alleles coding for a particular trait would be expressed whereas the other is unexpressed
   1. Law of IA: For every pair of unit factors, each of them would assort independently of other pairs into the newly formed gametes
   2. Law of Segregation: Paired alleles separate during gamete formation. Consequently, each gamete would contain only allele from each pair.
4. Genetic Diversity: Which ultimately is beneficial for the species in term of adapting to changing environments and the possible evolution of the species
   1. Good to be asexual when you are at the bottom of the ocean, nothing is really happening over there.
   2. Bacteria reproduce in both, binary fission.
5. AB ¼ B 2/4 A ¼
6. This is just when the homologous chromosomes fail to separate during meiosis(anaphase I). Monosomy and trisomy conditions result upon fertilization. EX. Turner (Monosomy 23, XO) Kleinsfelter (Trisomy 23, XXY), Down Syndrome (Trisomy 21), Edwards (Trisomy 18)
7. ½ normal ½ will have PKU
8. DNA conditions the genes which code for a protein. The DNA forms chromosomes which are contained in the nucleus of a eukaryotic cell.
9. They inherit from their mother.
10. Many genes coding for one trait. These genes have a quantitative effect meaning that they act as “doses”, the more “doses” one inherits the more pronounced the trait. EX. Skin, color, hair, eye color, height.
11. Yes. The medium brown skinned parents have some recessive, non-pigment alleles. The child can inherit more of these than each of the individual parents. EX. Parents each have 3 out 6 dominant alleles for pigmentation. The child can inherit anywhere from 0 to 6 units from these two parents. Anything less than 3 units would be lighter than the medium dark parents. Any more than 3 would be darker.
12. Co-Both alleles expressed ( black and white chickens)
    1. Incomplete: Neither is fully expressed (pink flowers from red and white)
13. Environment affects the genetic expression. Ex. Hydrangeas; the same plate can have blue or red flowers depending on the soil pH. Skin color can vary according to exposure to the sun. Height can very according to one’s nutrition.
14. Crossing over in Prophase I of meiosis, IA in metaphase I and II of meiosis and random fertilization
15. The cell would have a total of 4 chromosomes (two sets of 2; the sets look different and may show crossing over of chromatids). In metaphase II there would be only one individual from each pair for a total of two lined up on the equator.
16. One gene, many phenotypic effects. EX. Sickle cell anemia is caused by one recessive gene but has many phenotypic expressions: brain damage, anemia, kidney failure, spleen damage, possible paralysis etc.
17. 3. It is recessive because you can’t have children