Mendelian Inheritance in Humans Classroom Activity

Name: _____

Human have several single-gene traits that are easy to observe and which are controlled by genes that have only two alleles. Based on the specific combination of alleles (AA, Aa = dominant phenotype; aa = recessive phenotype) the trait is either present or absent. There is no "in between". Many other human traits, such as eye color and height are due to several pairs of genes, and the phenotypes show a continuous range of variation.

For the traits described in the following list, determine your phenotype and possible genotype.

Trait	Symbol	Dominant Phenotype	Your phenotype	Your genotype
1. **Facial dimples**: Best seen when smiling. With dominant phenotype, you may have a dimple only on one side, or on both.	D, d	dimples		
2. **Bent little finger:** A dominant allele causes the last joint of the little finger to dramatically bend inward toward the 4th finger. Lay both hands flat on a table relax your muscles, and note whether your have a bent or straight little finger.	B, b	bent		
3. **Eye Color:** Eye color, as well as hair and skin color, is a complex trait. The main pigment is melanin, and the more melanin, the darker the color. While the genetics of eye color is complex, alleles for the production of melanin dominate those for lack of melanin. Evaluate your eyes as either brown (M) or non-brown (m).	E, e	brown		
4. **Free ear lobe**: Dominant trait is for lobes to hang free. With recessive phenotype, the lobes are attached directly to the head.	F. f	free		
5. **Mid-digital hair:** Some people have hair on the middle segment of one or more of their fingers, while others don't. Any hair at all is the dominant phenotype. Complete absence of hair is recessive.	H, h	hair		
6. **Hand clasping**: When the hands are clasped (without thinking about it!), most people place their left thumb on top of their right.	L,l	left on top		
7. **Early Onset Myopia** (childhood): Nearsightedness is a complex trait with at least 4 gene loci involved, however the heritability of myopia is very high and shows a dominant pattern.	M, m	myopic		
8. **Achondroplasia**: The most frequent or of short-limb dwarfism. Affected individuals (Aa) exhibit short stature cause by shortening of the limbs. (AA individuals die before birth).	A, a	achondroplasia		
9. **Chin cleft**: A prominent cleft in the chin is inherited as the dominant phenotype. The cleft is due to the bond structure which underlies the Y-shaped fissure of the chin. Females appear to be less conspicuously affected than males.	C,c	cleft		
10. **Achoo syndrome:** Autosomal dominant trait also called photo sneeze reflex, usually 2 – 3 successive sneezes, when a dark-adapted person suddenly is exposed to bright light.	A, a	sneezing		