Name _____ **Period** _____

Regents Biology **Date** _____

GENETICS PRACTICE 1: BASIC GENETICS

1. If a blue-eyed woman had children with a homozygous brown-eyed man, what is the chance of any of their children having blue eyes. Show the Punnett Square.

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2. If a blue-eyed woman had children with a heterozygous brown-eyed man, what is the chance of any of their children having blue eyes. Show the Punnett Square.

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3. If 2 heterozygous brown-eyed parents had children, what is the chance of any of their children having blue eyes. Show the Punnett Square.

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4. In purple people eaters, one-horn is dominant and no horns is recessive. Draw a Punnett Square showing the cross of a purple people eater that is heterozygous for horns with a purple people eater that does not have horns. Summarize the genotypes & phenotypes of the possible offspring.

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5. Sickle cell anemia is a real recessive disease of the blood. It causes your red blood cells to be crescent-shaped instead of round which means they can't do their job of carrying oxygen in your blood. Since it is a recessive disease that means you need two copies of the sickle cell gene to show the disease. If instead you are a heterozygote — you have one good copy of the gene and one sickle cell copy of the gene — you don't show the disease. But you are carrying the one bad copy of the gene and can pass it on to your children. Therefore, a heterozygote is also called a "carrier". Let's consider a situation where two carriers marry and have children. Draw a Punnett Square showing the cross and summarize the genotypes & phenotypes of the possible children. Tell me whether the children have normal blood, are carriers, or have the sickle cell disease.

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