**Extension: Dihybrid Crosses**

**Name:**

**Directions:** Complete the following questions below. The last question has you viewing a video to learn how to complete a linked gene cross so please take time in watching this as you most likely will not know how to complete this question without it. Please either save this document as a digital copy or add it to your portfolio as a hard copy.

1. About 70% of Americans perceive a bitter taste from the chemical phenylthiocarbamide (PTC). The ability to taste this chemical results from a dominant allele (T) and not being able to taste PTC is a result of having two recessive alleles (t). Albinism is a trait with normal pigment being dominant (A) and the lack of pigment being recessive (a). A normally pigmented woman who cannot taste PTC has a father who is an albino taster. She marries a homozygous, normally pigmented man who is a taster but who has a mother that does not taste PTC. Show the possible genotypes of their offspring using a Punnett square and indicate the phenotypic ratio of them.
2. You have one plant that is homozygous recessive for seed and pod colour. A second plant is homozygous dominant for the same traits. Explain how you can use these two plants to create a population of true-breeding plants for green seed and yellow pod colour (self-pollination is not possible). Draw Punnett squares to illustrate the cross(es).
3. Watch the video linked [here](https://www.youtube.com/watch?v=d82IOkGmsbc) to learn how to find the possible offspring for linked genes and to assist with answering the following question. You can also find the link to the video under the extension page on class notebook.

Two fruit flies are crossed assessing the linked genes of colour and wing type. Assume that brown (B) is dominant to black (b) and normal winged (N) is dominant to wingless (n). The female is heterozygous for both traits and the male is a true-breed black, wingless fly.

1. What are the possible genotypes of the F1 generation for the cross.
2. What does recombination mean?
3. Which offspring in the F1 would be considered a recombinant?