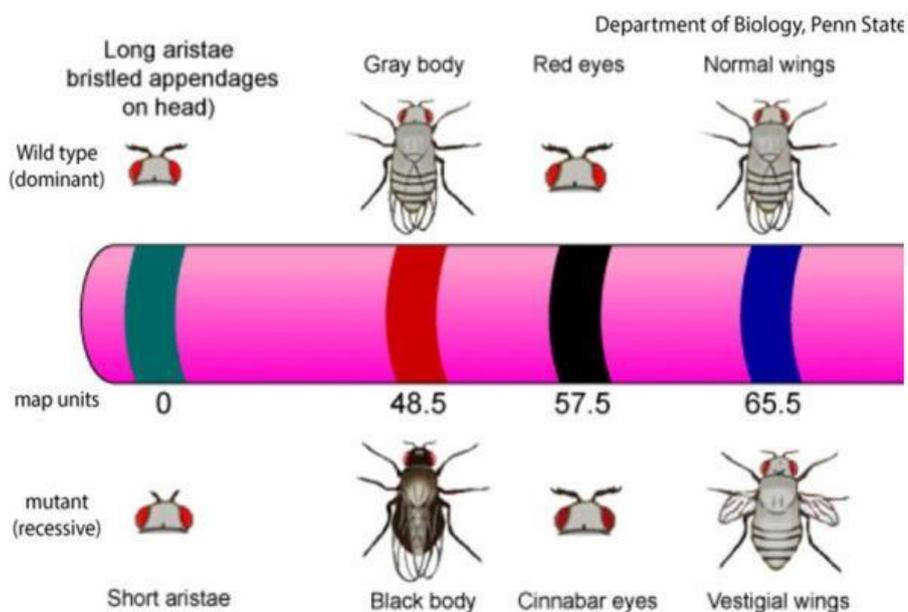


Linkage question 2024

1. Figure 1. is an illustrated diagram of a chromosome showing the relative position of 4 genes (length of arista, color of body, color of eyes, size of wings) in a *Drosophila* (fly). The diagram also illustrates the phenotypes for each gene. The diagram is not drawn to scale, and only one chromosome is shown. One map unit is equal to one recombination percentage.



- a. What are the phenotypes of each of the four genes? (Drag and Drop)

Gene	Phenotype
Length of arista	
Color of body	
Color of eyes	
Size of wing	

Normal/vestigial wing

Short/Long arista

Black/gray body

Red/Cinnabar eyes

- b. Rank the genes pairs in descending order of LE, starting with the largest first.

1	
2	
3	
4	
5	
6	

We are now required to map a fifth gene that of *length of legs* on to the chromosome. Offspring can have either long legs or short legs. Two *Drosophila* were crossed and the phenotypes of the offspring are tabulated as below.

- c. Calculate the recombination fraction between the genes for *length of aristae* and *length of legs* given the following tabulated information.

	Phenotype	No. of individuals
Parents	Short aristae, long legs	
	Long aristae, short legs	
Offspring	Short aristae, long legs	1000
	Long aristae, short legs	2500
	Short aristae, short legs	1000
	Long aristae, long legs	1000

%

Are the two genes in Linkage equilibrium?

Length of aristae- Color of body

Length of aristae- Color of eyes

Length of aristae- size of wing

Color of body- Color of eyes

Color of body- size of wing

Size of wing- color of eyes