

### Dihybrid Cross Worksheet

Use the table below to answer the following questions on plant genetics.

Trait	Dominant allele	Recessive allele
Seed shape	Round	Wrinkled
Pod shape	smooth	constricted
Flower position	axial	terminal
Plant height	tall	short
Seed colour	green	yellow

You need to assume in each question that in an individual each combination of genes is **UNLINKED**. That is they are on separate chromosomes so would be assorting independently during meiosis. If your observed ratios are not the same as your expected ratios then you will conclude that the two genes are **LINKED** and are not independently assorting.

- A.** In peas, round seed shape (R) is dominant to wrinkled seed shape (r), and green seed colour (G) is dominant to yellow seed colour (g)

A pea plant which is homozygous round seed and has yellow seed colour is crossed with a pea plant that is heterozygous round seed shape and heterozygous green seed colour.

1. What are the chances of the offspring being homozygous for round seed?
  2. What are the chances of the offspring being homozygous for wrinkled seed?
  3. What are the chances of the offspring being homozygous for green seed colour?
  4. What are the chances of the offspring being homozygous for yellow seed colour?
  5. What are the chances of the offspring being heterozygous for both seed shape and colour?
  6. What is the genotypic ratio?
  7. What is the phenotypic ratio?
  8. If this cross is actually done and the observed ratios of phenotypes does not appear to be the same as what you expect, what do you conclude about the two genes?
- B.** In the following plants axial flower position is dominant over terminal flower position and smooth pod shape is dominant constricted pod shape. Determine the offspring expected when two pea plants, each heterozygous for flower position and pod shape, are crossed.
9. What are the chances of the offspring being homozygous for both flower position and pod shape?
  10. What are the chances of the offspring being heterozygous for both flower position and pod shape?
  11. What is the genotypic ratio?
  12. What is the phenotypic ratio?