

Probabilities, proportions, and hypothesis testing

Chapter 7 number 24

Each member of a large genetics class grows 12 pea plants from an independent pea family. Each family is expected to have $\frac{3}{4}$ plants with smooth peas and $\frac{1}{4}$ plants with wrinkled peas.

- A** On average, how many wrinkled pea plants will a student see in her 12 plants?
- B** What is the standard deviation of the proportion of wrinkled pea plants per a student (see page 189)?
- C** What is the variance in the proportion of wrinkled pea plants per a student?
- D** Predict the proportion of students that saw exactly two wrinkled pea plants in their sample.

Chapter 8 number 14

Testing the effect of window angle on bird impact deaths. Treatments were vertical, 20, or 40 degrees off vertical. During the experiment 30, 15, and 8 birds were killed by each type of window respectively

- A** Clearly state a null and alternative hypothesis
- B** What proportion of deaths were in vertical windows
- C** What statistical test could you use to test the null?
- D** Is there evidence that window angle affects the mortality rate of birds?

Chapter 9 number 24

32 of 50 French *Drosophila* are sterile at high temperature.

20 of 50 Indian *Drosophila* are sterile at high temperature.

- A** Is this observational or experimental?
- B** Make either a bar or mosaic plot of this data and give a one sentence description of what the figure suggests
- C** Is there evidence that the flies from these two locations are significantly different?
- D** Calculate the relative risk of sterility in *Drosophila* from India to France. Include the 95% confidence interval. Formula is on 256.

Chapter 9 number 27

Two groups of older women were compared 132 had recently lost a spouse of these 28 had marked decline in health, 47 had moderate health decline and 57 had no health deterioration. The control group 98 women who had no recently lost spouse had 7, 31, and 60 in each of the respective categories. Is the pattern of health deterioration different in the two groups?