Example Context Elaboration: Combined Probabilities

Focus: Calculate probabilities

Achievement objective S8-4

In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:

Investigate situations that involve elements of chance:

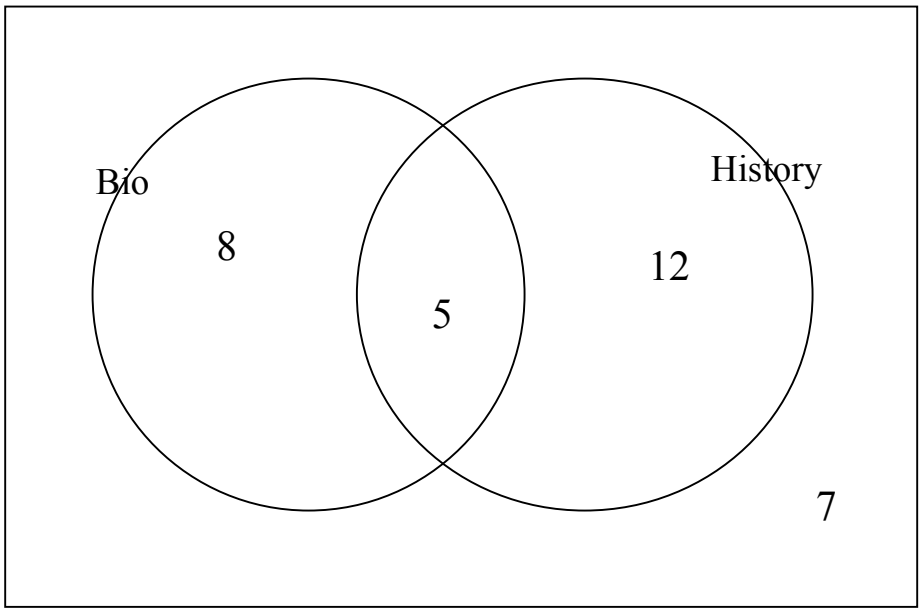
A calculating probabilities of independent, combined, and conditional events

B calculating and interpreting expected values and standard deviations of discrete random variables

C applying distributions such as the Poisson, binomial, and normal

Venn diagrams

Graham and Samantha begin to extend their understanding of probability by considering the probability of combined events. Members of the class write their name on the correct region of a Venn diagram, showing which of the option subjects Bio or History they take. Their teacher then reduces the diagram to the number of students in each region.



Rhea and Sarah discuss the probability of a student taking both subjects, or "Bio or History". They become aware of the ambiguity of this question, and work out the probability of each of the two meanings, inclusive of both subjects or not.

Their teacher leads them to use set notation to describe their findings using set notation, and for the inclusive or

$$P(B \cup H) = P(B) + P(H) - P(B \cap H)$$

For some students it is better to continue to use probability language such as AND and OR rather than set notation.