Example Context Elaboration: Conditional 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

Birthdays and pizza

Graham and Samantha take part in a class discussion about birthdays. The teacher asks the students to consider this:

If you ask for the birthday of someone in the classroom, how likely is it that it will be in January?

The teacher leads them to the idea that they can get a first cut at an answer by making some assumptions (e.g. all days of the year have equal number of births in New Zealand). There is data on births which would give a better estimate.

If you know that pizza is the favourite food of the person you are asking, will this affect how likely it is that this student's birthday is in January? Why or why not? If you know the country of birth will that affect it?

From the discussion, Graham and Samantha develop an informal idea of independence: that the likelihood of a particular birth month is probably not related to the favourite food of the person.