TL13: Linear vs non-linear graphing

For the data that this Case deals with, the model of improvement would be asymptotic. Given the scope of the Mathematics to be covered in this Case and the age group of the target audience, it is likely that you will assume that the progression of performances fits a linear model. However in many track and field events the changes in performances have been flattening over the last 20-30 years. If time allows and for more capable pupils/classes, the idea of asymptotic relationships may be explored and the final activity of the Case may involve pupils hand sketching such a relationship on their scatter plot. This is likely to change the answer to predictions about future performances. While using a linear model, in many events, it will appear that women are still improving faster than men and will therefore one day overtake them. As was pointed out in TL5, the data analysis in lesson 2 will address the question "Have women improved faster than men?" However "Are women still improving faster than men?" is a different question. Using a (more accurate) asymptotic relationship, the progression of men's and women's performances have generally become reasonably parallel, with the women approximately 10% behind the men. This would indicate the women will not one day overtake men (see **Women of the future are on track to run faster than men**). If technology such as Excel is available to assist with this activity, pupils could quickly and easily explore modelling with a range of relationship types.