Module 03 Lesson 05
VoiceThread: Averages
Transcript

[Visual: A newspaper with the title "Exam Time: Reason to Stress?" as the headline.]

After reading this week's head article in the Biol Daily Times and applying what you now know of the scientific method, you may ask yourself that question again "how do I know if it is true?"

And, as such, you may generate a further question such as "Do exams lead to increased anxiety?" Now, this is a great question and one well worth studying. Cast your minds back to last week and remember that a hypothesis needs to be both testable and falsifiable. As such, we may generate a null hypothesis that states "There is no difference in student anxiety level on normal versus exam days," and an alternative hypothesis that states "There is a difference in student anxiety level on normal versus exam days."

Generally, once an experiment is conducted, the results are recorded in their raw form. So, if you measured anxiety levels in students on a normal university day as well on an exam day, you may get a raw data set that looks like this table:

	ANXIETY SCORE	
Individual	**normal day**	**exam day**
1	16	32
2	3	22
3	17	23
4	3	13
5	19	20
6	15	29
7	24	11
8	23	25
9	3	13
10	12	20
11	32	30

The data as it appears in its raw form does not tell you anything about the effect you are trying to test, and therefore cannot be used to test your hypothesis.

So, the first thing to do to make sense of all the numbers is to summarize the raw data to get an ‘average’ that best represents the population based on your sample individuals. While there are many types of averages that can be calculated, the most commonly used

one, and perhaps the one you are most familiar with is the Mean. Now all the mean really does is you add up all the numbers and then divide these by the number of individuals in your sample.

So, calculating the means from our normal day individuals would add up all the scores from the individuals on the normal day and divide it by the number of individuals, which in this case is 11, and end up with a value of 15.2 as our mean.

Similarly for the 'exam day' would add up the scores for the 11 individuals, divide it by the sample size, and you would get a mean value of 21.6.

Now that you have the averages, you can go back completing the steps of the scientific method. The normal day mean of 15.2 is a lot lower than the exam day mean of 21.6 and so you may well conclude that there is an observed effect of exams on anxiety levels. As such, if you revisit your hypothesis, you would reject your null hypothesis and accept the alternative hypothesis that there is a difference in student anxiety levels on normal versus exam days.