9.1 TB or Not TB?

A Develop Understanding Task

Tuberculosis (TB) can be tested in a variety of ways, including a skin test. If a person has tuberculosis antibodies, then they are considered to have TB. Below is a tree diagram representing data based on 1,000 people who have been given a skin test for tuberculosis.

1. Use your knowledge to write several probability statements about this test (based on the numbers provided).

2. Look over the statements you wrote. Put an asterisk (*) next to those that are conditional probability statements (statements based on margin “row” or “column” percentages). If there are not any, add some now.

3. Part of understanding the world around us is being able to take information, make sense of it, and then explain it to others. Based on your statements above, what would you say to a friend regarding the validity of their results if they are testing for TB and only get a skin test? Be sure to use data to best inform your friend.
Other questions to consider....

4. In this situation, explain the consequences of errors (having a test with incorrect results).

5. If a health test is not 100% certain, why might it be beneficial to have the results lean more toward a false positive?

6. Is a sample space of 200 enough to indicate whether or not this is true for an entire population?

7. How would you answer the young adult who tested positive and asks, “Do I really have TB?”
Ready, Set, Go!

Ready
Topic: Venn Diagrams, create and read.

For each Venn Diagram provided answer the questions.

1. How many students were surveyed?
2. What were the students asked?
3. How many students are in both choir and band?
4. How many students are not in either choir or band?
5. What is the probability that a randomly selected student would be in band?

This Venn Diagram represents enrollment in some of the elective courses.

6. What does the 95 in the center tell you?
7. What does the 145 tell you?
8. How many total students are represented in the diagram?
9. Which elective class has the least number of students enrolled?
Set

Topic: Interpret a tree diagram, making observations of probability.

Given the tree diagram below answer the questions and determine the probabilities. The diagram represents the number of plate appearances during the first month of a minor league baseball season.

10. How many times did a batter come to the plate during this time period?

11. Based on this data, if you are a left-handed batter what is the probability that you will face a right-handed pitcher?

12. Based on this data, if you are a right-handed batter what is the probability that you will face a left-handed pitcher?

13. What is the probability that a left-handed pitcher will be throwing for any given plate appearance?

14. What is the probability that a left-handed batter would be at the plate for any given plate appearance?

15. What observations do you make about the data? Is there any amount that seems to be overly abundant? What might account for this?

Go

Topic: Basic Probability

Find the probability of achieving success with each of the events below.

16. Rolling an even number on standard six-sided die.

17. Drawing a black card from a standard deck of cards.

18. Flipping a coin and getting Heads three times in a row.

19. Rolling a die and getting a four.

20. Drawing an ace from a deck of cards.

21. Rolling a die twice in a row and getting two threes.

22. From a bag containing 3 blue, 2 red, and 5 white marbles. Pulling out a red marble.