Probability: Determining Probabilities

II.A Student Activity Sheet 2: Using Tree Diagrams

A church group in Washington state sells pumpkins every year to raise money for the children of their town. This year's crop, however, produced very small pumpkins. The group decided to construct a corn maze in a field and charge customers to walk through the maze. Customers can only walk forward. If the customers end up at an exit with pumpkins, they win a pumpkin. The church group asked some students to advise it on various possibilities of a customer getting a pumpkin.

Students were shown a simple maze as an example.

1. Make a tree diagram to show the group the possible paths customers might take, entering the maze on the upper, middle, or lower path and proceeding to an exit with or without a pumpkin.

How is this tree diagram different from others you have worked with before?

2. Create a tree diagram showing all possible sandwiches.

Assume that you make all the possible sandwich combinations that you can using one choice from each column of ingredients in the table (bread, meat, cheese). Then someone puts all these different sandwiches in unmarked sacks on the counter. Given this information, answer Questions 3–7.

3. What is the probability you will select a sandwich with white bread? Explain your reasoning.

4. What is the probability you will select a sandwich with American cheese? Explain your reasoning.

5. What is the probability that you will select a sandwich on wheat bread with ham and any cheese? Explain your reasoning.

6. What is the probability you will select a sandwich on white bread that has either beef or turkey and has Provolone cheese? Explain your reasoning.

7. What is the probability you will select a sandwich with neither beef nor Muenster cheese? Explain your reasoning.