

## Probability

### Activity 1a - Pascal's Triangle

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1. Search the internet to find Pascal's Triangle. and as much other information as you can find.
  - What is the recursion to get from one row to the next? (Be ready to teach your classmates how to find the next row.)
  - Do you notice any other patterns in the numbers?
2.
  - (a) Write out all sequences of heads and tails on two coin flips. How many have zero heads? one head? two heads?
  - (b) Write out all sequences of heads and tails on three coin flips. How many have zero heads? one head? two heads? three heads?
  - (c) Write out all sequences of heads and tails on four coin flips. How many have zero heads? one head? two heads? three heads? four heads?
  - (d) Write out all sequences of heads and tails on five coin flips. How many have zero heads? one head? two heads? three heads? four heads? five heads?
  - (e) Are there patterns that you see? Can you describe how to use the information from the previous step to help with the answer for the next step?
3.
  - (a) FOIL  $(x + y)^2$ . Write out all four terms literally (do not change the order of the letters at first). Then simplify.
  - (b) FOIL  $(x + y)^3$ . Write out all eight terms literally. How does the previous answer help this process? Then simplify.
  - (c) FOIL  $(x + y)^4$ . Write out all 16 terms literally. How does the previous answer help this process? Then simplify.
  - (d) FOIL  $(x + y)^5$ . Write out all 32 terms literally. How does the previous answer help this process? Then simplify.
4.
  - (a) Write out all of the sets of one letter from the set  $\{A, B\}$ . all the sets of two letters.
  - (b) Write out all of the sets of one letter from the set  $\{A, B, C\}$ . all the sets of two letters, three letters.
  - (c) Write out all of the sets of one letter from the set  $\{A, B, C, D\}$ . all the sets of two letters, three letters, four letters.
  - (d) Write out all of the sets of one letter from the set  $\{A, B, C, D, E\}$ . all the sets of two letters, three letters, four letters, five letters.