

Domain	Probability and Informed Decisions	
Cluster	Use probability to evaluate outcomes and make decisions.	
Standard(s)	M.ASHS.26	Use two-way tables, tree diagrams, Venn diagrams, or 10 x 10 grids to model probabilities.

Content Examples:

- » Two-way tables and Venn Diagrams:
<https://www.khanacademy.org/math/ap-statistics/analyzing-categorical-ap/stats-two-way-tables/v/two-way-frequency-tables-and-venn-diagrams>
- » Compound Events with Tree Diagrams:
<https://youtu.be/4fBXIcO0It4>
- » Tree Diagram Worked Example:
https://youtu.be/hxEdXUB_IdQ
- » How to create segmented bar charts in Excel:
<https://www.statisticshowto.datasciencecentral.com/what-is-a-segmented-bar-chart/>

Relevant Content:

Vocabulary:

- » Association: An association is a relationship between two variables in which knowing the value of one variable helps predict the value of the other. If knowing the value of one variable does not help predict the value of the other, there is no association between the variables.
- » Bar Graph: A bar graph is a graph used to display the distribution of a categorical variable or to compare the sizes of different quantities. The horizontal axis of a bar graph identifies the categories or quantities being compared. The heights of the bars show the frequency or relative frequency for each value of the categorical variable. The graph is drawn with blank spaces between the bars to separate the items being compared.
- » Conditional Probability: A conditional probability is a probability that involves one event happening given that another event is already known to have happened. Suppose we know that event A has happened. Then the probability that event B happens given that event A has happened is denoted by $P(B|A)$, use the formula:

$$P(B|A) = \frac{P(A \cap B)}{P(A)}$$

- » Pie Chart: A pie chart is a chart that shows the distribution of a categorical variable as a “pie” whose slices are sized by the counts or percentages for the categories. A pie chart must include all the categories that make up a whole.

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- » Relative Frequency Table: A relative frequency table is a table that shows the percentages (relative frequencies) of observations in each category or interval.
 - » Segmented Bar Graph: A segmented bar graph is a graph used to compare the distribution of a categorical variable in each of several groups. For each group, there is a single bar with “segments” that correspond to the different values of the categorical variable. The height of each segment is determined by the percent of individuals in the group with that value. Each bar has a total height of 100%.
 - » Two-Way Table: A two-way table is a table of counts that organizes data about two categorical variables.

Stats Medic Chapter 4: Probability (this standard directly relates to 4.3-4.5):

<https://www.statsmedic.com/introstats-chapter-4>

Probability Problem Trail:

<http://noblestatman.com/uploads/6/6/7/3/66731677/probty.prob.trail.tipin.pdf> (11 problems)

Assessment Links or Tasks:

- » Venn Diagram Practice:
<https://www.statsmedic.com/intro-day52>
 - » Allows you to modify a two-way table and see the graphical representation: Analyzing Two-Way Tables (Dolphins) Applet
<http://www.rossmanchance.com/applets/ChiSqShuffle.html?dolphins=1>
 - » Analyzing Two-Way Tables (Yawning) Applet
<http://www.rossmanchance.com/applets/ChiSqShuffle.html?yawning=1>
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