

<b>Domain</b>	<b>Designing Studies</b>	
<b>Cluster</b>	<b>Design and implement a plan to collect and analyze data.</b>	
<b>Standard(s)</b>	M.ASHS.10	Recognize the purposes of and differences among sample surveys, experiments, and observational studies. Explain the importance of randomization in each method. Instructional Note: Emphasize that the way in which data is collected determines the scope and nature of the conclusions.

**Content Examples:**

Why randomize:

[https://www.youtube.com/watch?v=V\\_GljFw6RZE](https://www.youtube.com/watch?v=V_GljFw6RZE)

**Relevant Content:**

- » Experiments:  
<https://www.khanacademy.org/math/ap-statistics/gathering-data-ap/statistics-experiments/v/intro-experiment-design>
- » Collecting Data: surveys, experiments, and observational studies:  
<https://mathbitsnotebook.com/Algebra2/Statistics/STSurveys.html>
- » The Essential Guide to Writing Effective Survey Questions:  
<https://www.uxbooth.com/articles/the-essential-guide-to-writing-effective-survey-questions/>

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## Vocabulary

- » Causation: A well-designed experiment that randomly assigns experimental units to treatments allows inference about cause and effect.
- » Inference: Inference involves drawing conclusions that go beyond the data at hand.
- » Inference about cause and effect: Inferences about cause and effect involve conclusions from the results of an experiment that the treatments caused the difference in responses. This requires a well-designed experiment in which the treatments are randomly assigned to the experimental units.
- » Inference about a population: Inferences about a population involve conclusions about the larger population based on sample data. This requires that the individuals taking part in a study be randomly selected from the population of interest.
- » Random Assignment: Random assignment is an experimental design principle. Random assignment involves using chance to assign experimental units to treatments. This helps create roughly equivalent groups of experimental units by balancing the effects of other variables among the treatment groups.
- » Random Sampling: Random sampling involves using a chance process to determine which members of a population are chosen for the sample.
  
- » Stats Medic – Sampling and Surveys (3.5):  
<https://www.statsmedic.com/intro-day39>
- » Stats Medic – Observational Studies and Experiments (3.6):  
<https://www.statsmedic.com/intro-day40>
- » Stats Medic – Using Studies Wisely (3.9):  
<https://www.statsmedic.com/intro-day43>
- » Study Design:  
<https://www.khanacademy.org/math/ap-statistics/gathering-data-ap#statistics-experiments>

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## Assessment Links or Tasks:

- » Surveys, experiments, and observational studies:  
<https://www.sd27j.org/cms/lib/CO01900701/Centricity/Domain/572/8.3%20Practice%20set%202.pdf>
  - » Surveys, experiments, and observational studies practice:  
<https://d3jc3ahdjad7x7.cloudfront.net/d07ga5gr0q16lOw0iXid6nViLS7l6bDJMwgLvDycmM1wdLIG.pdf>
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