Content Map: Statistical Studies

Teacher Materials: Statistical Studies Teacher Materials (The Charles A. Dana Center)

CCGPS Unit Standards or Troup County Version (TCV):

MAMDM3. Students will apply statistical methods to design, conduct, and analyze statistical studies

MAMDM4. Students will use functions to model problem situations in both discrete and continuous relationships.

a. Determine whether a problem situation involving two quantities is best modeled by a discrete (pattern identification, population growth, compound interest) or continuous (medication dosage, climate change, bone decay) relationship.

Prerequisites:

✓ Understanding the concept of the mean of a set of numbers
✓ Computing percentages and applying percentages to a total
✓ Applying prior vocabulary
✓ Showing familiarity with histograms, dotplots, boxplots, and frequency tables
✓ Displaying data in a variety of ways
✓ Analyzing distributions by center, shape, spread, and unusual features
✓ Identifying the population of interest

Unit Length: 29 days
## Concept 1: Statistical Investigations (MAMDMD3 and D4.a)

**Essential Questions:**
- How can students identify the components of the research cycle?
- How can students determine whether statistical studies are observational or experimental and consider the strengths and weaknesses in the studies?
- How can students identify the appropriate treatment for study participants and interpret margin of error?
- How can students identify variables and populations of interest as well as data sources?
- How can students choose and apply the appropriate sampling design for given situations and identify the sampling techniques used in studies?
- How can students design a research study to demonstrate statistical investigations?

**Resources:**
- 3.A Student Activity Sheet 1: Overview of Purpose, Design, and Studies
- 3.A Teacher Activity Sheet 1: Overview of Purpose, Design, and Studies
- 3.A Student Activity Sheet 2: Treatment of Subjects
- 3.A Teacher Activity Sheet 2: Treatment of Subjects
- 3.A Student Activity Sheet 3: Margin of Error
- 3.A Teacher Activity Sheet 3: Margin of Error
- 3.A Student Activity Sheet 4: Sampling Design and Methods
- 3.A Teacher Activity Sheet 4: Sampling Design and Methods

## Concept 2: Analyzing Data (MAMDMD3 and 4.a)

**Essential Questions:**
- How can students interpret a variety of graphical displays of statistical information?
- How can students estimate center, shape, spread, and unusual features of graphical displays and use these characteristics to describe distributions?
- How can students analyze the appropriateness and usefulness of statistical graphical displays?
- How can students prepare appropriate statistical reports and communicate in oral and written form?
- How can students collect sets of data and create a variety of displays?
- How can students compare and contrast multiple data sets?

**Resources:**
- 3.B Student Activity Sheet 5: Histograms
- 3.B Teacher Activity Sheet 5: Histograms
- 3.B Student Activity Sheet 6: Analyzing Graphical Displays
<table>
<thead>
<tr>
<th>Concept 3: Sources of Variability (MAMDMD3 and 4.a)</th>
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<tbody>
<tr>
<td><strong>Essential Questions:</strong></td>
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<tr>
<td>• How can students investigate sources of variability?</td>
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<tr>
<td>• How can students investigate sources of statistical bias?</td>
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<td>• How can students explain the effect of statistical bias on the generalizability of results?</td>
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| **Resources:**  
| 3.C Student Activity Sheet 9: Introduction to Statistical Bias and Variability  
| 3.C Teacher Activity Sheet 9: Introduction to Statistical Bias and Variability  
| 3.C Student Activity Sheet 10: Statistical Bias in Research Studies and Polls  
| 3.C Teacher Activity Sheet 10: Statistical Bias in Research Studies and Polls |