### Grade PK
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Explore and display data**
  - a. Explore data by answering a yes/no question
  - b. Display data on real graphs

#### 25. Birds and Worms
- **b. Organize and display data to make real graphs**


### Grade K
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Collect, organize, and display data**
  - a. Collect data by answering a question
  - b. Collect data on tally charts

#### 25. Birds and Worms
- **b. Collect data in tables**

#### 36. Pollution Search, Part A
- **b. Organize and display data in line plots and frequency tables using a variety of categories and sets of data**

### Grade 1
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Collect, organize, and display data**
  - a. Collect data by conducting surveys
  - b. Collect data on tables

#### 25. Birds and Worms
- **b. Collect data in line plots and frequency tables using a variety of categories and sets of data**

#### 48. Field, Forest, & Stream
- **b. Organize and display data in stem-and-leaf plots**

### Grade 2
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Collect, organize, and display data**
  - a. Collect data by conducting surveys
  - b. Collect data on tables

#### 25. Birds and Worms
- **b. Organize and display data in stem-and-leaf plots**

#### 48. Field, Forest, & Stream
- **b. Organize and display data in stem-and-leaf plots**

### Grade 3
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Collect, organize, and display data**
  - a. Collect data by conducting surveys
  - b. Collect data on tables

#### 25. Birds and Worms
- **b. Organize and display data in stem-and-leaf plots**

#### 48. Field, Forest, & Stream
- **b. Organize and display data in stem-and-leaf plots**

### Grade 4
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Collect, organize, and display data**
  - a. Collect data by conducting surveys
  - b. Collect data on tables

#### 25. Birds and Worms
- **b. Organize and display data in stem-and-leaf plots**

#### 48. Field, Forest, & Stream
- **b. Organize and display data in stem-and-leaf plots**

### Grade 5
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Collect, organize, and display data**
  - a. Collect data by conducting surveys
  - b. Collect data on tables

#### 25. Birds and Worms
- **b. Organize and display data in stem-and-leaf plots**

#### 48. Field, Forest, & Stream
- **b. Organize and display data in stem-and-leaf plots**

### Grade 6
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Organize and display data**
  - a. Organize and display data using back-to-back stem-and-leaf plots

#### 25. Birds and Worms
- **b. Organize and display data to make circle graphs**

### Grade 7
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Organize and display data**
  - a. Organize and display data using circle graphs

#### 25. Birds and Worms
- **b. Organize and display data to make circle graphs**

### Grade 8
- **Standard 4.0 Knowledge of Statistics:** Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

#### A. Data Displays
- **1. Organize and display data**
  - a. Organize and display data using box-and-whisker plots

#### 25. Birds and Worms
- **b. Organize and display data to make box-and-whisker plots**
<table>
<thead>
<tr>
<th>d. Organize and display data to make single bar graphs</th>
<th>d. Organize and display data to make single bar graphs</th>
<th>d. Organize and display data to make single bar graphs using a variety of categories and intervals</th>
<th>d. Organize and display data in double bar graphs</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. Organize and display data on picture graphs</td>
<td>c. Organize and display data on picture graphs</td>
<td>c. Organize and display data on picture graphs</td>
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<td>c. Organize and display data to make picture graphs</td>
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<td>c. Organize and display data to make pictographs using scales of 1:1 and 2:1</td>
<td>c. Organize and display data to make pictographs using scales of 1:1 and 2:1</td>
<td>c. Organize and display data to make pictographs using scales of 1:1 and 2:1</td>
<td>c. Organize and display data to make pictographs using scales of 1:1 and 2:1</td>
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<td>c. Organize and display data to make pictographs using a variety of scales</td>
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<td>c. Organize and display data to make pictographs using a variety of scales</td>
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<tr>
<td>Assessment limit:</td>
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<tr>
<td>• Use scales of 2:1, 4:1, or 10:1 and whole numbers (0 – 100)</td>
<td>• Use scales of 2:1, 4:1, or 10:1 and whole numbers (0 – 100)</td>
<td>• Use scales of 2:1, 4:1, or 10:1 and whole numbers (0 – 100)</td>
<td>• Use scales of 2:1, 4:1, or 10:1 and whole numbers (0 – 100)</td>
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<tr>
<td>c. Organize and display data in line plots</td>
<td>c. Organize and display data in line plots</td>
<td>c. Organize and display data using a back-to-back stem-and-leaf plot</td>
<td>c. Organize and display data to make a scatter plot</td>
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<td>Assessment limit:</td>
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<tr>
<td>• Use no more than 20 pieces of data with a range of no more than 20 and whole numbers (0 – 200)</td>
<td>• Use no more than 20 pieces of data with a range of no more than 20 and whole numbers (0 – 200)</td>
<td>• Use no more than 10 points and whole numbers (0 – 1000)</td>
<td>• Use no more than 10 points and whole numbers (0 – 1000)</td>
</tr>
<tr>
<td>36. Pollution Search, Part A</td>
<td>36. Pollution Search, Part A</td>
<td>limit:</td>
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<tr>
<td>• Use no more than 4 categories of data with intervals of 1, 2, 5, or 10 and whole numbers (0 – 100)</td>
<td>than 4 categories and intervals of 1, 2, 5, or 10 and whole numbers (0 – 100)</td>
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</tr>
</tbody>
</table>

16. Pass the Plants, Please, Part B

36. Pollution Search, Part A

e. Organize and display data to make line plots using a variety of intervals

41. How Plants Grow, Part A

e. Organize and display data in line graphs

Assessment limit:

• Use y-axis with intervals of 1, 2, 4, 5, or 10 and x-axis with no more than 10 time intervals and whole numbers (0 – 100)

f. Determine the appropriate type of graph to effectively display data

B. Data Analysis
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<tbody>
<tr>
<td>a. Talk about data from real graphs to answer a question such as: Which category has the most?</td>
<td>b. Compare and describe data from a picture graph to answer a question</td>
<td>a. Interpret data contained in tables using a variety of categories and intervals</td>
<td>a. Interpret line plots</td>
<td>a. Interpret and compare data in stem &amp; leaf plot</td>
<td>a. Interpret frequency tables</td>
<td>a. Recognize and analyze faulty interpretation or representation of data</td>
<td>a. Interpret tables</td>
<td></td>
</tr>
<tr>
<td>a. Compare and describe data from real graphs to answer a question</td>
<td>a. Interpret data contained in pictographs using scales of 1:1 and 2:1</td>
<td>b. Interpret data contained in pictographs using a variety of categories and intervals</td>
<td>Use no more than 20 pieces of data with a range no more than 10 and whole numbers (0 – 100)</td>
<td>Use no more than 5 categories or ranges of numbers and frequencies of no more than 25</td>
<td></td>
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<tr>
<td>22. Trees as Habitats, Part B</td>
<td>b. Interpret line graphs</td>
<td>Assessment limit:</td>
<td>Use scales of 2:1, 4:1, or</td>
<td>Use the x-axis representing no more than 6 time</td>
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<td>b. Interpret data contained in pictographs using scales of 1:1 and 2:1</td>
<td>b. Interpret and compare data in line plots</td>
<td>b. Read and analyze circle graphs</td>
<td>b. Determine the best choice of a data display</td>
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<td>Use the x-axis representing no more than 6 time</td>
<td>Use no more than 5 categories using data in whole</td>
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</tr>
<tr>
<td>2. Interpreting Data:</td>
<td>3. Read and analyze circle graphs</td>
<td>b. Interpret box-and-whisker plots</td>
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<tr>
<td></td>
<td>Use no more than 5 categories having no more than 2 quantities per category and whole numbers or decimals with no more than 2 decimal places (0 – 100)</td>
<td>Assessment limit:</td>
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</tbody>
</table>

**Assessment limit:**
- Use no more than 4 categories from one set of data and whole numbers (0 – 100).
- Use no more than 20 pieces of data with a range no more than 10 and whole numbers (0 – 100).
- Use no more than 5 categories or ranges of numbers and frequencies of no more than 25.
- Use scales of 2:1, 4:1, or 6:1, or use the x-axis representing no more than 6 time.
- Use a given data set.
<table>
<thead>
<tr>
<th>c. Interpret data contained in single bar graphs</th>
<th>c. Interpret data contained in single bar graphs using a variety of categories and intervals of 1, 2, 5, and 10</th>
<th>c. Interpret data contained in single bar graphs using a variety of categories and intervals</th>
<th>c. Interpret and compare data in double bar graphs</th>
<th>c. Interpret data from a stem-and-leaf plot</th>
<th>c. Analyze misleading data representation</th>
<th>c. Interpret scatter plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Pass the Plants, Please;</td>
<td>10:1 and whole numbers (0 – 100)</td>
<td>intervals, the y-axis consisting of no more than 10 intervals with scales as factors of 100 using whole numbers (0 – 100)</td>
<td>range of no more than 20 and whole numbers (0 – 100)</td>
<td>numbers or percents (0 – 1000)</td>
<td>37. Reduce, Reuse, Recycle; Part A</td>
<td>(middle quartile), third (upper) quartile, or maximum and whole numbers (0 – 100)</td>
</tr>
</tbody>
</table>
### Part B

#### 25. Birds and Worms

<p>| | | | |</p>
<table>
<thead>
<tr>
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</thead>
</table>
| **d.** Interpret data contained in line plots using a variety of intervals | **d.** Interpret and compare data in double line graphs  
**Assessment limit:**  
- Use y-axis with intervals of 1, 2, 5, or 10 and x-axis with no more than 10 time intervals and whole numbers (0 – 100) | **d.** Interpret circle graphs  
**Assessment limit:**  
- Use no more than 8 categories (0 – 100) |   |
|   |   |   |   |
| **e.** Read circle graphs  
**Assessment limit:**  
- Use no more than 4 categories and data in whole numbers or percents which are multiples of 5 and whole numbers (0 – 100) |   |   |   |
<p>| <strong>2.</strong> Describe a set of data | <strong>2.</strong> Describe a set of data (mean, median, mode) | <strong>2.</strong> Describe a set of data | <strong>2.</strong> Describe a set of data |</p>
<table>
<thead>
<tr>
<th>Objective</th>
<th>Assessment Limit</th>
<th>Special Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Determine median, mode, and range</td>
<td>• Use no more than 8 pieces of data and whole numbers (0 – 100)</td>
<td></td>
</tr>
<tr>
<td>a. Determine the mean of a given data set or data display</td>
<td>• Use no more than 8 pieces of data and whole numbers without remainders (0 – 1000)</td>
<td></td>
</tr>
<tr>
<td>a. Apply measures of central tendency (mean, median, mode)</td>
<td></td>
<td>37. Reduce, Reuse, Recycle; Part A</td>
</tr>
<tr>
<td>a. Apply measures of central tendency to determine or apply mean, median, mode</td>
<td>• Use no more than 15 pieces of data for the mean or median; or 15 to 30 pieces of data for the mode, using whole numbers or decimals with no more than 2 decimal places (0 – 100)</td>
<td></td>
</tr>
<tr>
<td>a. Analyze measures of central tendency to determine or apply mean, median, mode</td>
<td></td>
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</tr>
</tbody>
</table>

Note: Highlighted assessment limits will be tested in the no calculator section of MSA. In the assessment limit, (0-10) or (-10 to 10) means all numbers in the problem or the answer will fall within the range of 0 to 10 (including endpoints) or -10 to 10 (including endpoints), respectively. All content standards are tested in MSA but not all objectives. Objectives that have an assessment limit are tested on MSA. Objectives without an assessment limit are not tested on MSA.

June 2004