

Mathematics Instructional Families –Data, Probability and Statistics

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View of Learning Targets and Families across Grades

View of Learning Targets, Families, and Access Points by Grade-band

Overview of APs: Data Analysis I

(K-4) Elementary School Learning Targets

Gather and interpret data to answer questions related to a particular/single context.

- *Formulate questions, gather data, and build representations;*
- *Identify and describe variation in data, and describe and compare shapes of distributions and measures of central tendency.*

Formulate Questions/ Plan Research		Represent and Interpret Data		Draw Conclusions from Data Collection	
Grades K-1		Grade 2		Grade 3	
Grade 4		Grade 3		Grade 4	
MAFS.K.CC.2.AP.5a Select a question that is answered by collected data	MAFS.2.MD.4.AP.10b Analyze data by sorting into categories established by each question	MAFS.3.MD.2.AP.3b Select the appropriate statement that describes the data representations based on a given graph (picture, bar, line plots)			
MAFS.1.MD.3.AP.4a Select questions that ask about “How many” and represent up to three categories that can be concretely represented	MAFS.2.MD.4.AP.10c Organize data by representing categorical data on a pictorial graph or bar graph	MAFS.3.MD.2.AP.3a Collect data, organize into picture or bar graph			
MAFS.1.MD.3.AP.4b Identify 2 categories resulting from a selected question	MAFS.2.MD.4.AP.9a Organize data by representing continuous data on a line plot	MAFS.3.MD.2.AP.4c Organize measurement data into a line plot			
MAFS.1.MD.3.AP.4c Analyze data by sorting into 2 categories; answer questions about the total number of data points and how many in each category	MAFS.2.MD.4.AP.10a Identify the value of each category represented on picture graph and bar graph or each point on a line plot				
	MAFS.2.MD.4.AP.10d Compare the information shown in a bar graph or picture graph with up to 4 categories. Solve simple comparisons of how many more or how many less				
MAFS.1.MD.3.AP.4d Using a picture graph, represent each object/person counted on the graph (1:1 correspondence) for two or more categories.	MAFS.2.MD.4.AP.10d Compare the information shown in a bar graph or picture graph with up to 4 categories. Solve simple comparisons of how many more or how many less				
MAFS.1.MD.3.AP.4e Interpret a picture graph to answer questions about how many in each category					
MAFS.1.MD.3.AP.4f Compare the values of the 2 categories of data in terms of more or less					

Overview of APs: Data Analysis I

(5-8) Middle School Learning Targets

Design investigations and gather data to answer questions about multiple populations.

- *Formulate questions, gather data, and build representations;*
- *Compare populations by analyzing distributions in terms of variability and measures of central tendency.*

Formulate Questions/ Plan Research		Represent and Interpret Data		Draw Conclusions from Data Collection	
Grade 5		Grade 6		Grade 8	
MAFS.5.MD.2.AP.2a Collect and graph fractional data in line plots (e.g., length of each person's pencil in classroom, hours of exercise each week)	MAFS.6.SP.1.AP.1a Identify statistical questions and make a plan for data collection	MAFS.7.SP.1.AP.1a Determine sample size to answer a given question		MAFS.8.SP.1.AP.4b Construct a two-way table summarizing data on two categorical variables collected from the same subjects; identify possible association between the two variables.	
	MAFS.6.SP.1.AP.2a Find the range of a given data set	MAFS.7.SP.2.AP.4a Identify the range (high/low), median (middle), mean, or mode of a given data set		MAFS.8.SP.1.AP.1a Graph data using line graphs, histograms, or box plots	
	MAFS.6.SP.2.AP.4a Display data on a line plot, such as dot plots, histograms or box plots.	MAFS.7.SP.2.AP.3a Make or select a statement to compare the distribution of 2 data sets		MAFS.8.SP.1.AP.1b Graph bivariate data using scatter plots and identify possible associations between the variables	
	MAFS.6.SP.1.AP.3a Solve for mean of a given data set	MAFS.7.SP.2.AP.4c Analyze graphs to determine or select appropriate comparative inferences about two samples or populations		MAFS.8.SP.1.AP.1c Using box plots and scatter plots, identify data points that appear to be outliers	
	MAFS.6.SP.2.AP.5a Select the statement that matches mean, mode and spread of data for one measure of central tendency for a given data set.			MAFS.8.SP.1.AP.4a Analyze displays of bivariate data to develop or select appropriate claims about those data	
	MAFS.6.SP.1.AP.3b Explain or identify what the mean represents in a set of data				
	MAFS.6.SP.1.AP.2b Explain or identify what the mode represents in a set of data				
	MAFS.6.SP.2.AP.5b Explain or identify what the median represents in a set of data				
	MAFS.6.SP.2.AP.5c Use measures of central tendency to interpret data including overall patterns in the data				

Overview of APs: Data Analysis II

(5-8) Middle School Learning Targets

Conduct probability experiments:

- *Generate random samples to characterize variability in estimates and predictions;*
- *Analyze and build models of the association between two variables.*

Develop and Use Probability Models		Draw Inferences About a Distribution	
Grade 7		Grade 8	
MAFS.7.SP.3.AP.5a Describe the probability of events as being certain or impossible, likely, less likely or equally likely		MAFS.8.SP.1.AP.2a Distinguish between a linear and non-linear association when analyzing bivariate data on a scatter plot	
MAFS.7.SP.3.AP.5b State the theoretical probability of events occurring in terms of ratios (words, percentages, decimals)			
MAFS.7.SP.3.AP.6a Make a prediction regarding the probability of an event occurring; conduct simple probability experiments			
MAFS.7.SP.3.AP.8a Determine the theoretical probability of multistage probability experiments (2 coins, 2 dice)			
MAFS.7.SP.3.AP.8b Collect data from multistage probability experiments (2 coins, 2 dice)			
MAFS.7.SP.3.AP.7a Compare actual results of simple experiment with theoretical probabilities			
MAFS.7.SP.3.AP.8c Compare actual results of multistage experiment with theoretical probabilities			

Overview of APs: Data Analysis I

(9-12) High School Learning Targets

Design and conduct statistical studies:

- Use appropriate statistical measures for analysis;
- Develop the concepts of statistical inference and statistical significance, especially in relation to probability principles and sampling distributions.

Formulate Questions/ Plan Research

Represent and Interpret Data

Draw Conclusions from Data Collection

HS

MAFS.912.S-ID.2.AP.5a

Design study using categorical and continuous data, including creating a question, identifying a sample, and making a plan for data collection

MAFS.912.S-ID.1.AP.1a

Complete a graph given the data, using dot plots, histograms, or box plots

MAFS.912.S-ID.1.AP.4a & MAFS.912.S-ID.2.AP.5b

Use descriptive stats; range, median, mode, mean, outliers/gaps to describe the data set

MAFS.912.S-ID.2.AP.6a

Represent data on a scatter plot to describe and predict

MAFS.912.S-ID.1.AP.2a

Compare means, median, and range of 2 sets of data

MAFS.912.S-ID.2.AP.6b

Select an appropriate statement that describes the relationship between variables

MAFS.912.S-IC.2.AP.6a

Make or select an appropriate statement(s) about findings

Overview of APs: Data Analysis II

(9-12) High School Learning Targets

Design and conduct statistical studies:

- *Use appropriate statistical measures for analysis;*
- *Develop the concepts of statistical inference and statistical significance, especially in relation to probability principles and sampling distributions.*

Use the rules of probability to interpret data, develop explanations, and address real-world problems

Develop and Use Probability Models

Draw Inferences About a Distribution

HS

MAFS.912.S-MD.2.AP.7a

Identify and describe the degree to which something is rated “good” or “bad”/desirable or undesirable based on numerical information

MAFS.912.S-MD.1.AP.3a

Determine the theoretical probability of multistage probability experiments

MAFS.912.S-MD.1.AP.3b

Collect data from multistage probability experiments

MAFS.912.S-MD.1.AP.3c

Compare actual results of multistage experiment with theoretical probabilities

MAFS.912.S-CP.1.AP.4a

Select or make an appropriate statement based on a two-way frequency table

MAFS.912.S-CP.1.AP.5a

Select or make an appropriate statement based on real-world examples of conditional probability

View by Instructional Families and Florida Standard Domains

Instructional Families: Data Analysis I

MAFS Domain: Counting and Cardinality; Measurement and Data	MAFS Domain: Measurement and Data; Statistics and Probability	MAFS Domain: Measurement and Data; Statistics and Probability; Interpreting Categorical and Quantitative Data; Making Inferences and Justifying Conclusions
Formulate Questions/Plan Research	Represent and Interpret Data	Draw Conclusions from Data Collection
MAFS.K.CC.2.AP.5a Select a question that is answered by collected data	MAFS.1.MD.3.AP.4c Analyze data by sorting into 2 categories; answer questions about the total number of data points and how many in each category	MAFS.1.MD.3.AP.4f Compare the values of the 2 categories of data in terms of more or less
MAFS.1.MD.3.AP.4a Select questions that ask about “How many” and represent up to three categories that can be concretely represented	MAFS.1.MD.3.AP.4d Using a picture graph, represent each object/person counted on the graph (1:1 correspondence) for 2 or more categories	MAFS.2.MD.4.AP.10d Compare the information shown in a bar graph or picture graph with up to 4 categories. Solve simple comparisons of how many more or how many less
MAFS.1.MD.3.AP.4b Identify 2 categories resulting from a selected question	MAFS.1.MD.3.AP.4e Interpret a picture graph to answer questions about how many in each category	MAFS.6.SP.1.AP.3b Explain or identify what the mean represents in a set of data
MAFS.6.SP.1.AP.1a Identify statistical questions and make a plan for data collection	MAFS.2.MD.4.AP.10b Analyze data by sorting into categories established by each question	MAFS.6.SP.1.AP.2b Explain or identify what the mode represents in a set of data
MAFS.7.SP.1.AP.1a Determine sample size to answer a given question	MAFS.2.MD.4.AP.10c Organize data by representing categorical data on a pictorial graph or bar graph	MAFS.6.SP.2.AP.5b Explain or identify what the median represents in a set of data
MAFS.912.S-ID.2.AP.5a Design study using categorical and continuous data, including creating a question, identifying a sample, and making a plan for data collection	MAFS.2.MD.4.AP.9a Organize data by representing continuous data on a line plot	MAFS.6.SP.2.AP.5c Use measures of central tendency to interpret data including overall patterns in the data
	MAFS.2.MD.4.AP.10a Identify the value of each category represented on picture graph and bar graph or each point on a line plot	MAFS.7.SP.2.AP.3a Make or select a statement to compare the distribution of 2 data sets
	MAFS.3.MD.2.AP.3a Collect data, organize into picture or bar graph	MAFS.7.SP.2.AP.4c Analyze graphs to determine or select appropriate comparative inferences about two samples or populations

MAFS Domain: Counting and Cardinality; Measurement and Data	MAFS Domain: Measurement and Data; Statistics and Probability	MAFS Domain: Measurement and Data; Statistics and Probability; Interpreting Categorical and Quantitative Data; Making Inferences and Justifying Conclusions
Formulate Questions/Plan Research	Represent and Interpret Data	Draw Conclusions from Data Collection
	MAFS.3.MD.2.AP.4c Organize measurement data into a line plot	MAFS.8.SP.1.AP.4a Analyze displays of bivariate data to develop or select appropriate claims about those data
	MAFS.3.MD.2.AP.3b Select the appropriate statement that describes the data representations based on a given graph (picture, bar, line plots)	MAFS.912.S-ID.1.AP.2a Compare means, median, and range of 2 sets of data
	MAFS.5.MD.2.AP.2a Collect and graph data: bar graph, line plots, picture graph (e.g., average height among 3 classrooms, # of boys and girls)	MAFS.912.S-ID.2.AP.6b Select an appropriate statement that describes the relationship between variables
	MAFS.6.SP.2.AP.4a Collect and graph data: bar graph, line plots, dot plots, histograms	MAFS.912.S-IC.2.AP.6a Make or select an appropriate statement(s) about findings
	MAFS.6.SP.1.AP.3a Solve for mean of a given data set	
	MAFS.6.SP.2.AP.5a Select statement that matches mean, mode, and spread of data for 1 measure of central tendency for a given data set	
	MAFS.6.SP.1.AP.2a Find the range of a given data set	

MAFS Domain: Counting and Cardinality; Measurement and Data	MAFS Domain: Measurement and Data; Statistics and Probability	MAFS Domain: Measurement and Data; Statistics and Probability; Interpreting Categorical and Quantitative Data; Making Inferences and Justifying Conclusions
Formulate Questions/Plan Research	Represent and Interpret Data	Draw Conclusions from Data Collection
	MAFS.7.SP.2.AP.4a Identify the range (high/low), median (middle), mean, or mode of a given data set	
	MAFS.8.SP.1.AP.4b Construct a two-way table summarizing data on two categorical variables collected from the same subjects; identify possible association between the two variables	
	MAFS.8.SP.1.AP.1a Graph data using line graphs, histograms, or box plots	
	MAFS.8.SP.1.AP.1b Graph bivariate data using scatter plots and identify possible associations between the variables	
	MAFS.8.SP.1.AP.1c Using box plots and scatter plots, identify data points that appear to be outliers	
	MAFS.912.S-ID.1.AP.1a Complete a graph given the data, using dot plots, histograms, or box plots	
	MAFS.912.S-ID.1.AP.4a & MAFS.912.S-ID.2.AP.5b Use descriptive stats; range, median, mode, mean, outliers/gaps to describe the data set	
	MAFS.912.S-ID.2.AP.6a Represent data on a scatter plot to describe and predict	

Instructional Families: Data Analysis II

MAFS Domain: Statistics and Probability; Using Probability to Make Decisions	MAFS Domain: Statistics and Probability; Using Probability to Make Decisions; Conditional Probability and the Rules of Probability
Develop and Use Probability Models	Draw Inferences about a Distribution
MAFS.7.SP.3.AP.5a Describe the probability of events as being certain or impossible, likely, less likely or equally likely	MAFS.7.SP.3.AP.7a Compare actual results of simple experiment with theoretical probabilities
MAFS.7.SP.3.AP.5b State the theoretical probability of events occurring in terms of ratios (words, percentages, decimals)	MAFS.7.SP.3.AP.8c Compare actual results of multistage experiment with theoretical probabilities
MAFS.7.SP.3.AP.6a Make a prediction regarding the probability of an event occurring; conduct simple probability experiments	MAFS.8.SP.1.AP.2a Distinguish between a linear and non-linear association when analyzing bivariate data on a scatter plot
MAFS.7.SP.3.AP.8a Determine the theoretical probability of multistage probability experiments (2 coins, 2 dice)	MAFS.912.S-MD.1.AP.3c Compare actual results of multistage experiment with theoretical probabilities
MAFS.7.SP.3.AP.8b Collect data from multistage probability experiments (2 coins, 2 dice)	MAFS.912.S-CP.1.AP.4a Select or make an appropriate statement based on a two-way frequency table
MAFS.912.S-MD.2.AP.7a Identify and describe the degree to which something is rated “good” or “bad”/desirable or undesirable based on numerical information	MAFS.912.S-CP.1.AP.5a Select or make an appropriate statement based on real-world examples of conditional probability
MAFS.912.S-MD.1.AP.3a Determine the theoretical probability of multistage probability experiments	
MAFS.912.S-MD.1.AP.3b Collect data from multistage probability experiments	