ELD STANDARD 3: The Language of Mathematics

MAISA Algebra 2, Unit 2, Univariate Data and Distributions

CONNECTIONS: Michigan Academic State Standards for Mathematics

EXAMPLE CONTEXT FOR LANGUAGE USAGE: Students will be given multiple sets of data, within the same context, of house prices in a specific area. The context will be read aloud. They will then decide and justify whether the mean and standard deviation are appropriate to use for the data sets. While only one context is read aloud, two different written examples of students' responses are provided based on data sets with and without outliers.

COGNITIVE FUNCTION: Students at all levels of English language proficiency **SYNTHESIZE** a context read aloud in order to **JUSTIFY** the use or nonuse of the mean and standard deviation for different sets of data.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Entering	Emerging	Developing	Expanding	Bridging	Reaching
Listening &	Synthesize a context read	Synthesize a context read	Synthesize a context read aloud	Synthesize a context read	Synthesize a context read	
Writing	aloud multiple times with	aloud multiple times with	multiple times with purposeful	aloud with purposeful	aloud with purposeful	
Ŭ	purposeful pauses and	purposeful pauses and	pauses to justify in complete	pauses to justify in	pauses to justify in	
	rephrasing as necessary, while	rephrasing as necessary,	sentences the use or nonuse of	compound/complex	compound/complex	
	pointing to supports, to justify	while pointing to supports, to	the mean and standard	sentences the use or	sentences the use or	
	in phrases or simples	justify in complete	deviation for different sets of	nonuse of the mean and	nonuse of the mean and	
	sentences the use or nonuse	sentences the use or	data using a suggested word list	standard deviation for	standard deviation for	
	of the mean and standard	nonuse of the mean and	(e.g., mean, standard deviation,	different sets of data using	different sets of data using	
	deviation for different sets of	standard deviation for	set of data, outliers,	a suggested word list (e.g.,	a required word list (e.g.,	
	data using a unit anchor chart,	different sets of data using a	normal/skew(ed)), a unit anchor	mean, standard deviation,	mean, standard deviation,	
	an illustrated reference sheet	suggested word list (e.g.,	chart, and an illustrated	set of data, outliers,	set of data, outliers,	
	for contextual words, and	mean, standard deviation,	reference sheet for contextual	normal/skew(ed)) and a	normal/skew(ed)) and a	
	sentence frames with answer	set of data, outliers,	words while working with a	unit anchor chart while	unit anchor chart while	
	choices while working with a	normal/skew(ed)), a unit	partner.	working with a partner.	working with a partner.	
	partner at a higher level of	anchor chart, an illustrated				
	English proficiency.	reference sheet for	Context to be read aloud:	Context to be read aloud:	Context to be read aloud:	
		contextual words, and	E.g., "Buying a home will likely	E.g., "Buying a home will	E.g., "Buying a home will	
	Context to be read aloud:	sentence stems/frames with	be one of your biggest	likely be one of your	likely be one of your biggest	
	E.g., "Buying a home will likely	answer choices while	investments [pause]. The value	biggest investments	investments [pause]. The	
	[rephrase as 'probably'] be one	working with a partner.	of your home depends on many	[pause]. The value of your	value of your home	
	of your biggest investments		factors [pause], some examples	home depends on many	depends on many factors	
	[pause, point to illustrated	Context to be read aloud:	are the market [pause], your	factors [pause], some	[pause], some examples	
	reference sheet, and rephrase	E.g., "Buying a home will	neighborhood [pause], the size	examples are the market	are the market [pause],	
	as 'a way to make money'].	likely [rephrase as	[pause], condition [pause], and	[pause], your neighborhood	your neighborhood [pause],	
	The value of your home	'probably'] be one of your	similar house values [pause].	[pause], the size [pause],	the size [pause], condition	
	depends on many factors	biggest investments [pause,	Home buyers often consider the	condition [pause], and	[pause], and similar house	
	[pause and point to illustrated	point to illustrated reference	average house value [pause] in	similar house values	values [pause]. Home	
	reference sheet], some	sheet, and rephrase as 'a	deciding if they want to move to	[pause]. Home buyers often	buyers often consider the	
	examples are the market	way to make money']. The	a certain area [pause]. Look at	consider the average	average house value	
	[pause and point to your	value of your home depends	the following sets of house	house value	[pause] in deciding if they	
	neighborhood [pause and point	on many factors			want to	

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Entering	Emerging	Developing	Expanding	Bridging	Reaching
Continued	illustrated reference sheet],	factors [pause and point to	values for a given area [pause].	[pause] in deciding if they	move to a certain area	
	your neighborhood [pause and	illustrated reference sheet],	For each set, determine if the	want to move to a certain	[pause]. Look at the	
	point to illustrated reference	some examples are the	mean [pause] and standard	area [pause]. Look at the	following sets of house	
	sheet], the size [pause and	market [pause and point to	deviation [pause] are	following sets of house	values for a given area	
	point to illustrated reference	illustrated reference sheet],	appropriate measures to use for	values for a given area	[pause]. For each set,	
	sheet], condition [pause and	your neighborhood [pause	analyzing house values [pause].	[pause]. For each set,	determine if the mean	
	point to illustrated reference	and point to illustrated	Justify your decision."	determine if the mean	[pause] and standard	
	sheet], and similar house	reference sheet], the size		[pause] and standard	deviation [pause] are	
	values [pause and point to	[pause and point to	E.g., [Student response for	deviation [pause] are	appropriate measures to	
	illustrated reference sheet].	illustrated reference sheet],	skewed data] "The mean and	appropriate measures to	use for analyzing house	
	Home buyers often consider	condition [pause and point	standard deviation should not	use for analyzing house	values [pause]. Justify your	
	[rephrase as 'think about'] the	to illustrated reference	be used for this set of data. The	values [pause]. Justify your	decision."	
	average house value [pause	sheet], and similar house	data set is skewed to the right	decision."		
	and point to illustrated	values [pause and point to	because of the outliers. Two		E.g., [Student response for	
	reference sheet] in deciding if	illustrated reference sheet].	houses have very high values.	E.g., [Student response for	skewed data] "The mean	
	they want to move to a certain	Home buyers often consider	The mean would not be a good	skewed data] "The mean	and standard deviation	
	area [pause]. Look at the	[rephrase as 'think about']	measure for the average home	and standard deviation	should not be used for this	
	following sets of house values	the average house value	value. The standard deviation	should not be used for this	set of data because the	
	for a given area [pause]. For	[pause and point to	should also not be used to study	set of data because the	data set is skewed to the	
	each set, determine [rephrase	illustrated reference sheet]	the spread. It is based on the	data set is skewed to the	right due to the outliers.	
	as 'think about'] if the mean	in deciding if they want to	mean."	right due to the outliers.	Since two of the houses	
	[pause and point to anchor	move to a certain area		Since two of the houses	have very high values, the	
	chart] and standard deviation	[pause]. Look at the	E.g., [Student response for	have very high values, the	mean would not be a good	
	[pause and point to anchor	following sets of house	symmetric data] "The mean and	mean would not be a good	measure for the average	
	chart] are appropriate	values for a given area	standard deviation should be	measure for the average	home value. The standard	
	measures [pause, point to	[pause]. For each set,	used for this set of data. The	home value. The standard	deviation will also be	
	illustrated reference sheet, and	determine [rephrase as	data set does not have outliers	deviation will also be	impacted because it is	
	rephrase as 'a good idea'] to	'think about'] if the mean	and looks normal. No houses	impacted because it is	calculated using the mean	
	use for analyzing house values	[pause and point to anchor	have very high or very low	calculated using the mean	and therefore should not be	
	[pause and point to illustrated	chart and standard	values. The mean would be a	and therefore should not be	used to analyze the	
	reference sheet]. Justity your	deviation [pause and point	good measure	used to analyze the	spread."	
		to anchor chart] are		spread."		

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Entering	Emerging	Developing	Expanding	Bridging	Reaching
Continued	decision [pause and rephrase	appropriate measures	for the average home value.	E.g., [Student response for	E.g., [Student response for	
	as 'tell me why']."	[pause, point to illustrated	The standard deviation should	symmetric data] "The mean	symmetric data] "The mean	
		reference sheet, and	also be used to study the	and standard deviation	and standard deviation	
	(Use/do not use)	rephrase as 'a good idea'] to	spread. It is based on the	should be used for this set	should be used for this set	
	the(mean/standard	use for analyzing house	mean."	of data because the data	of data because the data	
	deviation). [Repeat for each	values [pause and point to		set does not contain	set does not contain	
	measure.]	illustrated reference sheet].		outliers and is	outliers and is	
	The data set	Justify your decision [pause		approximately normal.	approximately normal.	
	looks(normal/skewe	and rephrase as 'tell me		Since no houses have very	Since no houses have very	
	d).	why']."		high or very low values, the	high or very low values, the	
	I see(outliers/no			mean would be a good	mean would be a good	
	outliers).	The(mean/standard		measure for the average	measure for the average	
		deviation)		home value. The standard	home value. The standard	
		(should/should not) be used.		deviation should also be	deviation should also be	
		[Repeat for each measure.]		used because it is	used because it is	
		The data set		calculated using the mean	calculated using the mean	
		looks(normal/skew		and will help analyze the	and will help analyze the	
		ed) because		spread of the data."	spread of the data."	

ELD STANDARD 3: The Language of Mathematics

MAISA Algebra 2, Unit 2, Univariate Data and Distributions

EXAMPLE CONTEXT FOR LANGUAGE USAGE: The details of the activity can be found at https://www.illustrativemathematics.org/content-standards/HSS/ID/A/3/tasks/942 where students are asked to create a box plot from the data summaries of haircut costs for female and male college students and then describe the similarities and differences in shape, center, and spread of the two distributions. The strand of differentiation below corresponds to Part B of the activity, which provides an opportunity for students to produce language, in this case speaking. Either the students would have previously created box plots in Part A or teachers may provide the data summaries as box plots as well as in table form.

Oftentimes, students do not include the context when comparing distributions. However, students should be encouraged to provide the comparison in context. For example, in this task the comparison should be in terms of haircut costs for female and male college students. In addition, rather than describing each distribution separately, students should also be encouraged to actually compare the cost distributions. For example, students should be encouraged to say statements like "the mean haircut cost for female is \$50 higher than the mean haircut cost of the male" rather than "one mean is 80 and the other mean is 30."

Note that the sentence stems/frames below include "context word". Teachers should replace "context word" with the corresponding context word(s) for the given problem prior to giving students the sentence stems/frames. This allows the sentence stems/frames to be generalized to additional problems within the unit and/or course. Alternatively, teachers could highlight "context word" in the sentence stems/frames and highlight the corresponding context word on the reference/illustrated reference sheet as well as on the language of each idividual problem (context).

To aid Level 1 students in justifying statistical measures such as why a sample is skewed, the teacher could ask follow up questions (e.g., "Why do you think it is skewed? Why do you think that happened?"). These questions prompt Level 1 students to point, gesture, or provide one word answers in English, or their first language. Level 1 students are able to justify their thinking and should be provided adequate scaffolds in order to do so.

This strand addresses HSS-ID.A.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

COGNITIVE FUNCTION: Students at all levels of English language proficiency **DESCRIBE** the similarities and differences in shape, center, and spread of two distributions in the context of the data sets.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Entering	Emerging	Developing	Expanding	Bridging	Reaching
Speaking	Describe in short phrases or	Describe in simple	Describe in multiple complete	Describe in compound	Describe in compound	
	sentences the similarities and	sentences the similarities	sentences the similarities and	and/or complex sentences	and/or complex sentences	
	differences in shape, center,	and differences in shape,	differences in shape, center,	the similarities and	the similarities and	
	and spread of two distributions	center, and spread of two	and spread of two distributions	differences in shape,	differences in shape,	
	using a unit anchor chart, a	distributions in context using	in context, using a unit anchor	center, and spread of two	center, and spread of two	
	reference sheet, an illustrated	a unit anchor chart, a	chart, reference sheet,	distributions in context	distributions in context	
	reference sheet with context	reference sheet, an	sentence frames/stems with	using a unit anchor chart,	using a unit anchor chart	
	words, sentence frames with	illustrated reference sheet	choices, and working with a	suggested word list (e.g.,	and suggested word list	
	choices, and working with a	with context words,	partner.	boxplot, distribution,	(e.g., boxplot, distribution,	
	partner of higher English	sentence frames with		symmetric, skewed, center,	symmetric, skewed, center,	
	language proficiency.	choices, and working with a		spread, median, mean,	spread, median, mean,	
		partner of higher English		mode, range, interquartile	mode, range, interquartile	
		language proficiency.		range, outlier,	range, outlier,	

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Entering	Emerging	Developing	Expanding	Bridging	Reaching
continued	E.g., [Students repeatedly use	E.g., [Students repeatedly	E.g., [Students repeatedly use	minimum, maximum), and	minimum, maximum) while	
	the frames/stems as	use the frames/stems as	the frames/stems as	reference sheet while	working with a partner.	
	necessary.]	necessary.]	necessary.]	working with a partner.		
	The boxplot for	The boxplot for	The boxplot for		E.g., "Both boxplots show	
	(context word e.g., males/	(context word e.g.,	(context word e.g.,	E.g., "Both boxplots show	distributions that are	
	females) is	males/females) is	males/females) is	distributions that are	skewed to the right. It	
	(symmetric/skewed).	(symmetric/skew	(symmetric/skewed)	skewed to the right. It	makes sense that most	
		ed) because	because	makes sense that most	haircuts will not cost too	
	The(minimum/	The	The	haircuts will not cost too	much, but a few students	
	maximum) for(context	(minimum/maximu	(minimum/maximum)	much, but a few students	will spend a large amount.	
	word e.g., female haircut cost)	m) for(context word	for(context word e.g.,	will spend a large amount.	Since the cost will always	
	is(#).	e.g., female haircut cost)	female haircut cost) is	Since the cost will always	be a positive number, the	
		is	The range for	be a positive number, the	minimum cannot be less	
	The range for	The range for	(context word) is	minimum cannot be less	than 0, and there is a long	
	(context word) is(#).	(context word)	(smaller/larger) than	than 0, and there is a long	right tail.	
	This is(smaller	is(smaller/larger)	the range for (context	right tail.		
	than/larger than/equal to) the	than the range for	word).		The centers and spreads	
	range for (context	(context word).	The median for(context	The centers and spreads	are quite different. The	
	word).	The median	word e.g., males) is(#)	are quite different. The	median cost for females is	
		for(context word e.g.,	(more than/less	median cost for females is	about twice that of males,	
	The median for(context	males) is(#)	than/times/of) the median for	about twice that of males,	and there is much more	
	word e.g., males) is(#).	(more than/less	(context word).	and there is much more	variability in the haircut	
	This is#(more	than/times/of) the median for	The interquartile range for	variability in the haircut	costs for women. The	
	than/less than/times/of) the	(context word).	(context word) is	costs for women. The	interquartile range (IQR) for	
	median for (context	The interquartile range for	The mean is	interquartile range (IQR) for	women is \$55, while for	
	word).	(context word) is	(smaller/larger) than	women is \$55, while for	men it is \$10.75. The mean	
		The mean is	the median because	men it is \$10.75. The mean	is larger than the median	
	The interquartile range for	(smaller/larger)	Outliers(affect/do not	is larger than the median	because the distribution	
	(context word)	than the median because	affect) the	because the distribution	appears to be skewed to	
	is(#).	Outliers(affect/do	(median/mean)	appears to be skewed to	the right. The mean	
		not affect) the	because	the right. The mean	averages all the values in	
				averages all the	the data, so the	
	The mean is	(median/mean)		values in the data, so the	mean is "pulled" toward the	
	(smaller/larger)	because		mean is "pulled" toward the	high ones. The median is in	
	than the median.			high ones. The median is in	the middle of the data set	
				the middle of the data set	and is not affected by	
	Outliers(affect/do not			and is not affected by	outliers." (adapted from	
	affect) the			outliers." (adapted from	Illustrative Mathematics)	
	(median/mean).			Illustrative Mathematics)		

ELD STANDARD 3: The Language of Mathematics

MAISA Algebra 2, Unit 2, Univariate Data and Distributions

EXAMPLE CONTEXT FOR LANGUAGE USAGE: The strand below addresses the mathematics standard HSS-IC.B.3a: Recognize the purposes of and differences among sample surveys, experiments and observational studies. Students will read multiple scenarios and categorize them as best investigated through an experiment, a simulation, or an observational study. Prior to this lesson, students would have had experiences making sense of these different types of studies and sampling methods. During these experiences, students added illustrations or additional notes on the reference sheet as part of sense making. Students at Levels 1 and 2 would benefit from working in a small group with a paraprofessional or teacher to support making sense of the highly technical language. Throughout this lesson, students have access to this reference sheet and will use it as they analyze and categorize scenarios. (A reference sheet with space provided for student note taking is provided in the supports.)

The strand below provides supports to aid comprehensibility in reading. Students will need additional supports for speaking and/or writing as they are asked to explain their answers.

COGNITIVE FUNCTION: Students at all levels of English language proficiency will **ANALYZE** linguistically complex scenarios in order to **APPLY** an understanding of statistical terminology to categorize the scenarios according to appropriate sampling methods.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Entering	Emerging	Developing	Expanding	Bridging	Reaching
Reading	Analyze simplified, illustrated versions of various scenarios in order to apply an understanding of statistical terminology to categorize the scenarios, using a reference sheet while working with a partner. E.g., [See supports for the complete illustrated version of the simplified scenarios below.] Decide whether each each of the following research topics is best studied by an experiment, a simulation, or an observational study. Explain your answer. WHO WANTS TO KNOW a) A pizza restaurant Which pizza sauce do people like best? b) An energy drink company Does their new drink give people more energy?	Analyze glossed versions of linguistically complex scenarios in order to apply an understanding of statistical terminology to categorize the scenarios, using a reference sheet and an illustrated word list for contextual words, while working with a partner. E.g., Determine [gloss: decide] whether each of the following research topics is best investigated [gloss: studied] through an experiment, a simulation, or an observational study. Explain your answer. a) A pizza restaurant is trying to determine [gloss: decide] which pizza sauce recipe is preferred [gloss: liked] by its guests [gloss: people eating]. b) An energy drink	Analyze glossed versions of linguistically complex scenarios in order to apply an understanding of statistical terminology to categorize the scenarios, using a reference sheet while working with a partner. E.g., Determine [gloss: decide] whether each of the following research topics is best investigated [gloss: studied] through an experiment, a simulation, or an observational study. Explain your answer. a) A pizza restaurant is trying to determine [gloss: decide] which pizza sauce recipe is preferred [gloss: liked] by its guests [gloss: people eating]. b) An energy drink manufacturer [gloss: maker/company] is trying to determine [gloss: decide] whether a certain new	Analyze linguistically complex scenarios in order to apply an understanding of statistical terminology to categorize the scenarios, using a reference sheet and comparing work with a partner. E.g., Determine whether each of the following research topics is best investigated through an experiment, a simulation, or an observational study. Explain your answer. a) A pizza restaurant is trying to determine which pizza sauce recipe is preferred by its guests. b) An energy drink manufacturer is trying to determine whether a certain new ingredient improves the energy level	Analyze linguistically complex scenarios in order to apply an understanding of statistical terminology to categorize the scenarios, using a reference sheet and comparing work with a partner. E.g., Determine whether each of the following research topics is best investigated through an experiment, a simulation, or an observational study. Explain your answer. a) A pizza restaurant is trying to determine which pizza sauce recipe is preferred by its guests. b) An energy drink manufacturer is trying to determine whether a certain new ingredient improves the energy level	

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Entering	Emerging	Developing	Expanding	Bridging	Reaching
continued	 c) A doctor Do smokers and non-smokers have different average blood pressures? d) A town Will adding a traffic light increase or decrease the number of car accidents (crashes) at that intersection? 	manufacturer [gloss: maker/company] is trying to determine [gloss: decide] whether a certain new ingredient [gloss: something in the drink] improves [gloss: makes better] the energy level of consumers [gloss: people who drink it]. c) A doctor wants to compare [gloss: find differences] the average blood pressures of smokers [gloss: people who smoke] and non-smokers [gloss: people who do not smoke]. d) A town [gloss: small city] is trying to determine whether [gloss: decide if] installing [gloss: putting up] a traffic light will increase [gloss: make more] or decrease [gloss: make less] the number of car accidents [gloss: crashes] at that intersection [gloss with a picture of two roads crossing/intersecting lines].	ingredient [gloss: something in the drink] improves [gloss: makes better] the energy level of consumers [gloss: people who drink it]. c) A doctor wants to compare [gloss: find differences] the average blood pressures of smokers [gloss: people who smoke] and non-smokers [gloss: people who do not smoke]. d) A town [gloss: small city] is trying to determine whether [gloss: decide if] installing [gloss: putting up] a traffic light will increase [gloss: make more] or decrease [gloss: make less] the number of car accidents [gloss: crashes] at that intersection [gloss with a picture of two roads crossing/intersecting lines].	of consumers. c) A doctor wants to compare the average blood pressures of smokers and non-smokers. d) A town is trying to determine whether installing a traffic light will increase or decrease the number of car accidents at that intersection.	of consumers. c) A doctor wants to compare the average blood pressures of smokers and non-smokers. d) A town is trying to determine whether installing a traffic light will increase or decrease the number of car accidents at that intersection.	









Box plot : visual display of 5 number summary

	Minimum: the smallest number in data set				
For an even number of	Lower Quartile (Q1): the middle number to the left of the median in the data set, when data is in numerical order.				
values, add the two middle	Median (Q2): the middle number when data set is in numerical order				
numbers & divide by 2.	Upper Quartile (Q3): the middle number to the right of the median in the data set, when data is in numerical order				
Maximum: the largest number in data set					
Range: Maxi	Range: Maximum - Minimum Interquartile Range: Q3 - Q1 Mean: Mathematical average of the data				
Measures of Center: Mean, Median, or Mode of a data set (depends on distribution)					
Measures of Spread: Range, Interquartile Range, or Standard Deviation of data (depends on distribution)					
Shape: Describes the graph. Is it symmetric? How many peaks does it have? Is it skewed to the left or right? Is it uniform?					

MALE MAXIMUM (larger) RANGE **MINIMUM** (smaller) = = = -FEMALE COST INTERQUARTILE RANGE Q3 - Q1 HAIRCUT Lower Quartile Upper Quartile Median Q1 Q2 Q3

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Algebra2_Unit2_Speaking_IllustratedReferenceSheet

Population - set of all data or individuals the researcher is interested in studying Example: The school principal wants to know the most popular month for 10th grade student birthdays. The population is the birthdates of all tenth graders in the school	Sample - a subset of the population. Example: The birthdates of 40 tenth graders selected from a school with 500 tenth graders.
Bias - an error or influence that causes a misrepresentation of a population.	Unbiased - accurately represents the population.
Survey - an investigation in which every member of a sample is asked one or more questions.	Experiment - an investigation that imposes a treatment on individuals in order to collect information on their response to the treatment.
Observational Study - an investigation that observes individuals and measures variables without controlling the individuals or their environment. A survey is one example of an observational study.	Simulation - uses a model to reproduce the conditions of a situation using random probabilities so that the outcomes closely match the real-world outcomes

Random Sampling- each member of the population has an equal probability of being selected.	Self-selected Sampling - members of the population can choose whether to be part of the sample.
Systematic Sampling - a rule is used to select members of the population to be part of the sample. Example: Every tenth person is chosen.	Cluster Sampling - a population is divided into smaller naturally occurring groups (clusters) and all the members of one group or a few groups are selected (geographical grouping).
Stratified Sampling - a population is divided into smaller groups (strata) that share a similar characteristic (age, income, race, religion, etc.). A sample is then randomly selected from each group.	Convenience Sampling - only members of a population who are easy or convenient to study are selected for the sample.

Population - set of all data or individuals being studied. Example: The birthdates of all tenth graders in a school.	Additional notes/examples/diagrams:
Sample - a subset of the population.	
Example: The birthdates of 40 tenth graders selected from a school with 500 tenth graders.	
Bias - an error or influence that causes a misrepresentation of a population.	
Unbiased - accurately represents the population (no bias in the study).	

Survey - an investigation in which every member of a sample is asked one or more questions.	Additional notes/examples/diagrams:
Experiment - an investigation that imposes a treatment on individuals in order to collect information on their response to the treatment.	
Observational Study - an investigation that observes individuals and measures variables without controlling the individuals or their environment. A survey is one example of an observational study.	
Simulation - uses a model to reproduce the conditions of a situation using random probabilities so that the outcomes closely match the real-world outcomes	

Random Sampling - each member of the population has an equal probability of being selected.	Additional notes/examples/diagrams:
Self-selected Sampling - members of the population can choose whether to be part of the sample.	
Systematic Sampling - a rule is used to select members of the population to be part of the sample. Example: Every tenth person is chosen.	

Cluster Sampling - a population is divided into smaller naturally occurring groups (clusters) and all the members of one group or a few groups are selected.	Additional notes/examples/diagrams:
Stratified Sampling - a population is divided into smaller groups (strata) that share a similar characteristic. A sample is then randomly selected from each group.	
Convenience Sampling - only members of a population who are easy or convenient to study are selected for the sample.	

Algebra2_Unit2_Reading_IllustratedWordList



Algebra2_Unit2_Reading_IllustratedWordList



Algebra2_Unit2_Reading_SimplifiedIllustratedVersion



Who?	Wants to know what?
c) A doctor	c) Do smokers and nonsmokers have different average blood pressures?

Algebra2_Unit2_Reading_SimplifiedIllustratedVersion

