UNIT 15: LESSON 3

Workforce Application Assessment: Using Data for Planning

OVERVIEW	OVERVIEW						
Unit Title: T	Jnit Title: The Statistical Process – Posing the Right Question with Snack Trucks Length of Lesson in # of Hours: 3 # of Classes: 1						
How does t This lesson	his lesson connect to previous or future work as exemplified by the Standa applies what was learned in the two previous lessons about the Statistical Cy	rds in your scope and sequence? /cle to use collected data for planning a real-world scenario.					
LESSON OB	JECTIVES						
At the end of	this lesson, students will be able to:						
• und	lerstand the role that mathematics plays in data analytics						
• plar	n for a real-world data analysis project						
• mal	ke decisions and justify reasoning based on sample data						
STANDARD	S						
Citation							
7.SP.1	Understand that statistics can be used to gain information about a populat about a population from a sample are valid only if the sample is representa to produce representative samples and support valid inferences.	ion by examining a sample of the population; generalizations ative of that population. Understand that random sampling tends					
7.SP.2	Use data from a random sample to draw inferences about a population wit samples (or simulated samples) of the same size to gauge the variation in e	h an unknown characteristic of interest. Generate multiple estimates or predictions.					
1 - 3 MATH	EMATICAL PRACTICE(S) ADDRESSED IN THIS LESSON	ELEMENTS OF RIGOR					
MP 1: Make MP 3: Const MP 4: Mode	e sense of problems and persevere in solving them. truct viable arguments and critique the reasoning of others. el with mathematics.	 Which aspect(s) of Rigor do the targeted Standard(s) require? Conceptual understanding of key concepts Procedural skill and fluency 					
		Rigorous application of mathematics in real-world contexts					

ESSENTIAL QUESTIONS

What is the role that mathematics plays in data analytics and planning?

EVIDENCE OF LEARNING

Ways I and my students will know the extent to which the objectives have been met.

Students will be able to use data to make informed decisions and will be able to articulate their reasoning.

LEARNING PLAN - Vocabulary								
N/A								
LEARNING PLAN - Introduction	MATERIALS	TIME						
 Follow the <u>directions</u> for the Introduction of the <u>Real-Life Math: Data Analyst</u> to get students ready for the first of two activities related to real-world applications for statistical reasoning. Make connections back to the types of data they have collected in the last two lessons, particularly with the infirmary, countries and clothing, and popular foods. Note to teacher: The <u>printable directions</u> are for your use, not student use, as there are sample answers provided with the questions. 	Real-Life Math/Data Analyst: https://mpbn.pbslearningmedia.or g/resource/mkaet.math.sp.dataan alyst/real-life-math-data- analyst/#.WUw4bhPyt-U							
LEARNING PLAN – Body of the Lesson	MATERIALS	TIME						
The math behind data analytics								
 Next, show the video at Step 2 in the <u>directions</u> of the <u>Real-Life Math: Data Analyst</u>, and continue with the rest of the steps in this online resource. 	Projector with speakers (for video presentation)							

Workforce Application Assessment		
2. Assign student pairs the following activity: <i>Snack Truck Proposal</i> handout. Explain that they are going to open a snack food truck business near your program. Tell them that there has already been a survey conducted with a series of questions posed. Explain that they should work together to decide what questions they need to ask in order to write their proposal.	<i>Snack Truck Proposal</i> handout U15.L3 (one per student)	
<i>Note to teacher:</i> Do not give hints regarding questions they might need to pose. Let the pairs think about it on their own first.		
3. Then, based on the questions they ask, provide them with data from the Snack Truck Survey Data student handout. Note to teacher: Do not give hints regarding data that they need. Let the pairs think about it on their own first. Then, depending on the question(s) they ask, provide them with only the data set that addresses their question, so be sure to cut the data into individual sets, so that they can be distributed as needed. Some pairs may want all of the data – based on their questions – while others may choose to ask only one or two questions and therefore will need only one or two sets of data. If students get stuck on how to proceed, you can show them the Snack Truck Survey handout, which shows the questions that were posed and the data collected. The Snack Truck Survey Data teacher handout provides you with additional information for guiding your own understanding of what data to provide to students and the outcomes of the data collection.	Snack Truck Survey Data student handout U15.L3 (one set per student pair; cut apart the data) Snack Truck Survey handout U15.L3 (optional; one copy to share or additional copies for each pair) Snack Truck Survey Data teacher handout (teacher use only)	
 4. Once they feel they have the data they need, have them create a proposal that explains the choices they made. They will be expected to present their proposal in a PowerPoint presentation format. Remind them of the data analyst's words from the video regarding the value of using the right visuals in presentations. Note to teacher: Students may not be familiar with presentation applications like Microsoft PowerPoint. You may choose to assign them additional support for this portion of the lesson and have them share their presentation at the start of the next class, for example. There are some free tutorials and training programs available at www.GCFLearnFree.org for all of the Microsoft Office Suite. You may wish to reserve a computer lab to introduce students to this support resource or demonstrate it to the whole class if no computer lab is available. For those without access to technology, you may have the students do presentations using chart paper or poster board. Encourage them to use graph paper and visual models to illustrate the data in an informative way. Remind all students that benchmark fractions and percents are useful, too, in the wording they may use to describe their business proposal. 	Computers with a presentation application (such as PowerPoint)	

5. Distribute <i>Unit 15 Assessment Questions</i> handout and have students individually complete them.	<i>Unit 15 Assessment Questions</i> handout	
LEARNING PLAN – Closure / Conclusion	MATERIALS	TIME
Exit ticket prompt: Pose a question and share a strategy about how to collect data to answer the question.	Exit Ticket handout U15.L3	
ADDITIONAL PRACTICE	MATERIALS	
For further practice on providing questions related to a particular context (a jar of buttons) so that students can identify which are statistical questions. The task also provides students with an opportunity to write a statistical question that pertains to the context.	Buttons: Statistical Questions https://www.illustrativemathematics tent-standards/tasks/1040	s.org/con
The goal of this task is to promote a discussion of what makes a statistical question.	Statistical Questions https://www.illustrativemathematics tent-standards/6/SP/A/1/tasks/2008	s.org/con
Students practice data collection by gathering data within the classroom on common causes of allergies. They examine and interpret data charts on national trends in allergies.	Diagnosing Allergies through Data Co https://www.oercommons.org/cours osing-allergies-through-data-collection	ollection ses/diagn on

Snack Truck Proposal U15.L3

You would like to open a snack truck nearby. In order to do so, you have to present a plan to the local authorities (your teacher and peers) and convince them that there is a need for such a business in the area.

Decide what questions you need to ask. Then think about how you might find out where to get the answers to those questions. [Start with the local authorities to see if there is data available.]

Once you think you have enough information to decide how to move forward with your proposal, put together your results to present to the local authorities. Your proposal should include the following:

- Clear description of what you want to sell (including whether or not you will sell beverages)
- Clear explanation about why you have chosen the items that you have
- Benefits of your choices compared to other options
- Data justifying that there is a need/interest in what you have to sell
- Hours of operation, with reasoning to support those particular hours
- How much you will charge for each item, with reasoning to support your choices
- Explanation of why you think you will be successful
- Number of staff needed
- Where you would set up and why

Remember that you need to convince them that your snack truck will be successful!

Snack Truck Survey Data U15.L3

	0 - \$2.00	\$2.01 - \$4.00	\$4.01 - \$6.00	\$6.01 - \$8.00	\$8.01 - \$10.00
A slice of pizza	34	32	8	1	0
A hot dog	42	23	4	5	1
A salad	3	8	21	37	6
A sandwich	0	2	53	12	8
A cup of soup	2	16	46	10	1

75 people were surveyed: What is the most amount of money you would spend for...

100 people were surveyed: Rank your favorite lunch items. 5 = favorite; 1 = least favorite

	5	4	3	2	1
A slice of pizza	39	31	12	14	4
A hot dog	14	13	33	28	12
A salad	8	13	33	13	33
A sandwich	27	28	9	24	12
A cup of soup	12	15	13	21	39

	0 - \$2.00	\$2.01 - \$4.00	\$4.01 - \$6.00	\$6.01 - \$8.00	\$8.01 - \$10.00
A bag of chips	114	11	0	0	0
A breakfast bar	59	62	4	0	0
Fresh fruit	21	57	38	7	2
Dried fruit & nuts	34	69	13	6	3
Fresh veggies & dip	4	18	73	25	5

125 people were surveyed: What is the most amount of money you would spend for...

90 people were surveyed: Rank your favorite snack food. 5 = favorite; 1 = least favorite

	5	4	3	2	1
A bag of chips	32	25	10	21	2
A breakfast bar	5	2	19	6	58
Fresh fruit	22	15	22	15	16
Dried fruit & nuts	14	18	29	23	6
Fresh veggies & dip	17	30	10	25	8

9		
	~	
	, ``	

	5	4	3	2	1
Coffee	34	28	4	6	13
Теа	8	27	15	20	15
Water	5	15	43	10	12
Soda	31	6	4	23	21
Juice	7	9	19	26	24

85 people were surveyed: Rank your favorite beverages. 5 = favorite; 1 = least favorite

Snack Truck Survey Data U15.L3

120 people were surveyed:

What are the top two times you are most likely to take a break for lunch or a snack during the day?

	Choose two
	break times
9:00 – 9:15 a.m.	3
9:15 – 9:30 a.m.	4
9:30 – 9:45 a.m.	4
9:45 – 10:00 a.m.	11
10:00 – 10:15 a.m.	8
10:15 – 10:30 a.m.	13
10:30 – 10:45 a.m.	7
10:45 – 11:00 a.m.	9
11:00 – 11:15 a.m.	13
11:15 – 11:30 a.m.	2
11:30 – 11:45 a.m.	6
11:45 a.m. – 12:00 p.m.	19
12:00 – 12:15 p.m.	27
12:15 – 12:30 p.m.	29
12:30 – 12:45 p.m.	24
12:45 – 1:00 p.m.	21
1:00 – 1:15 p.m.	8
1:15 -1:30 p.m.	11
1:30 – 1:45 p.m.	3
1:45 – 2:00 p.m.	1
2:00 – 2:15 p.m.	4
2:15 – 2:30 p.m.	0
2:30 – 2:45 p.m.	5
2:45 – 3:00 p.m.	4
3:00 – 3:15 p.m.	3
3:15 – 3:30 p.m.	1

Snack Truck Survey U15.L3

	0 - \$2.00	\$2.01 - \$4.00	\$4.01 - \$6.00	\$6.01 - \$8.00	\$8.01 - \$10.00
A slice of pizza	0	0	0	0	0
A hot dog	0	0	0	0	0
A salad	0	0	0	0	0
A sandwich	0	0	0	0	0
A cup of soup	0	0	0	0	0

What is the most amount of money you would spend for...

Rank your favorite lunch items. 5 = favorite; 1 = least favorite

	Rank your favorite
A slice of pizza	
A hot dog	
A salad	
A sandwich	
A cup of soup	

What is the most amount of money you would spend for...

	0 - \$2.00	\$2.01 - \$4.00	\$4.01 - \$6.00	\$6.01 - \$8.00	\$8.01 - \$10.00
A bag of chips	0	0	0	0	0
A breakfast bar	0	0	0	0	0
Fresh fruit	0	0	0	0	0
Dried fruit & nuts	0	0	0	0	0
Fresh veggies & dip	0	0	0	0	0

Rank your favorite snack food. 5 = favorite; 1 = least favorite

	Rank your favorite
A bag of chips	
A breakfast bar	
Fresh fruit	
Dried fruit & nuts	
Fresh veggies & dip	

Rank your favorite beverages. 5 = favorite; 1 = least favorite

	Rank your favorite
Coffee	
Теа	
Water	
Soda	
Juice	

Snack Truck Survey U15.L3

What are the top two times you are most likely to take a break for lunch or a snack during the day?

	Choose two break times
9:00 – 9:15 a.m.	0
9:15 – 9:30 a.m.	0
9:30 – 9:45 a.m.	0
9:45 – 10:00 a.m.	0
10:00 – 10:15 a.m.	0
10:15 – 10:30 a.m.	0
10:30 – 10:45 a.m.	0
10:45 – 11:00 a.m.	0
11:00 – 11:15 a.m.	0
11:15 – 11:30 a.m.	0
11:30 – 11:45 a.m.	0
11:45 a.m. – 12:00 p.m.	0
12:00 – 12:15 p.m.	0
12:15 – 12:30 p.m.	0
12:30 – 12:45 p.m.	0
12:45 – 1:00 p.m.	0
1:00 – 1:15 p.m.	0
1:15 -1:30 p.m.	0
1:30 – 1:45 p.m.	0
1:45 – 2:00 p.m.	0
2:00 – 2:15 p.m.	0
2:15 – 2:30 p.m.	0
2:30 – 2:45 p.m.	0
2:45 – 3:00 p.m.	0
3:00 – 3:15 p.m.	0
3:15 – 3:30 p.m.	0

Snack Truck Survey Data (Teacher) U15.L3

75 people were surveyed: What is the most amount of money you would spend for						
	0 - \$2.00	\$2.01 - \$4.00	\$4.01 - \$6.00	\$6.01 - \$8.00	\$8.01 - \$10.00	
A slice of pizza	34	32	8	1	0	75
A hot dog	42	23	4	5	1	75
A salad	3	8	21	37	6	75
A sandwich	0	2	53	12	8	75
A cup of soup	2	16	46	10	1	75
	81	81	132	65	16	

In this set, the columns can add up to more than 75 because people can choose the same price range for more than one food choice. The rows have to add up to 75 because each person chooses one price range for each food choice. The column totals give information about how much people are willing to spend in general (i.e., 132 people were willing to spend \$4.01-\$6.00, but not all on the same thing.)

100 people were surveyed: Rank your favorite lunch items. 5 = favorite; 1 = least favorite

	5	4	3	2	1	
A slice of pizza	39	31	12	14	4	100
A hot dog	14	13	33	28	12	100
A salad	8	13	33	13	33	100
A sandwich	27	28	9	24	12	100
A cup of soup	12	15	13	21	39	100
	100	100	100	100	100	-

	0 - \$2.00	\$2.01 - \$4.00	\$4.01 - \$6.00	\$6.01 - \$8.00	\$8.01 - \$10.00	
A bag of chips	114	11	0	0	0	125
A breakfast bar	59	62	4	0	0	125
Fresh fruit	21	57	38	7	2	125
Dried fruit & nuts	34	69	13	6	3	125
Fresh veggies & dip	4	18	73	25	5	125
	125	125	125	125	125	

-----×

125 people were surveyed: What is the most amount of money you would spend for...

90 people were surveyed: Rank your favorite snack food. 5 = favorite; 1 = least favorite

	5	4	3	2	1	
A bag of chips	32	25	10	21	2	90
A breakfast bar	5	2	19	6	58	90
Fresh fruit	22	15	22	15	16	90
Dried fruit & nuts	14	18	29	23	6	90
Fresh veggies & dip	17	30	10	25	8	90
	90	90	90	90	90	ŭ

	5	4	3	2	1	
Coffee	34	28	4	6	13	85
Теа	8	27	15	20	15	85
Water	5	15	43	10	12	85
Soda	31	6	4	23	21	85
Juice	7	9	19	26	24	85
	85	85	85	85	85	a

85 people were surveyed: Rank your favorite beverages. 5 = favorite; 1 = least favorite

120 people were surveyed:

What are the top two times you are most likely to take a break for lunch or a snack during the day?

	Choose two
	break times
9:00 – 9:15 a.m.	3
9:15 – 9:30 a.m.	4
9:30 – 9:45 a.m.	4
9:45 – 10:00 a.m.	11
10:00 – 10:15 a.m.	8
10:15 – 10:30 a.m.	13
10:30 – 10:45 a.m.	7
10:45 – 11:00 a.m.	9
11:00 – 11:15 a.m.	13
11:15 – 11:30 a.m.	2
11:30 – 11:45 a.m.	6
11:45 a.m. – 12:00 p.m.	19
12:00 – 12:15 p.m.	27
12:15 – 12:30 p.m.	29
12:30 – 12:45 p.m.	24
12:45 – 1:00 p.m.	21
1:00 – 1:15 p.m.	8
1:15 -1:30 p.m.	11
1:30 – 1:45 p.m.	3
1:45 – 2:00 p.m.	1
2:00 – 2:15 p.m.	4
2:15 – 2:30 p.m.	0
2:30 – 2:45 p.m.	5
2:45 – 3:00 p.m.	4
3:00 – 3:15 p.m.	3
3:15 – 3:30 p.m.	1

The maximum number of time slots each vote can get is 120. The total number of votes is 240 since each person votes for two time slots.

Exit Ticket handout U15.L3

Pose a question and share a strategy about how to collect data to answer the question.

Pose a question and share a strategy about how to collect data to answer the question.

Pose a question and share a strategy about how to collect data to answer the question.

Pose a question and share a strategy about how to collect data to answer the question.

Pose a question and share a strategy about how to collect data to answer the question.