LessonTitle: School Lunches	**Pre 4.0a**
Utah State Core Standard, Indicators Pre-Algebra Standards 2.1,3.1,4.2 Process Standards1-5	

Summary

In this lesson, students collect and analyze their own nutritional data related to school lunches. They record what they eat for lunch for a week, research the nutrients for their food and their own "recommended dietary allowance" (RDA) for these nutrients. They create circle graphs and analyze their data and graphs. (This lesson was adapted from the article "Using School Lunches to Study Proportion" by Tamar Attia, from NCTM's Mathematics Teaching in the Middle School, September 2003,)

Enduring Understanding	**Essential Questions**
You can collect and analyze data about your own eating habits.	How do you figure out if you're getting the right nutrients in the food you eat?
Skill Focus	**Vocabulary Focus**
Collecting, organizing, interpreting data	

Assessment

Materials: Data collection sheets (see below), access to spreadsheet software.

Launch

Explore

Summarize

Apply

Directions:

1) Data collection: Ask students to write down, for a week, everything they eat during lunchtime at school.
2) Students research the nutrients in the foods eaten for lunch during the data collection week. Supervise the searching—students can find the sites. Sites are available which show the RDA (Recommended Dietary Allowance) for specific ages, sex, body size, and activity level. Try: kse.buildingbetterhealth.com/topic/macronutrient or www.monkeymatters.com/charts
3) Students transfer information to a spreadsheet. They use the "average" function on the spreadsheet to calculate the mean. (see below)

	Food Eaten	Grams of Fat	Grams of Protein	Grams of Carbohy-drates	Grams of Fiber
Monday	A cup of apple juice, peanut butter sandwich, mashed potatoes	14.6	5.7	189.3	3.6
Tuesday	A cup of apple juice, chips, peanut butter sandwich	23.1	8.1	143.7	4.1
Wednesday	A cup of apple juice, peanut butter sandwich	14	5.5	22.6	0.6
Thursday	Two pieces of pizza and a cup of apple juice	14.8	20.3	48.5	1
Friday	A cup of apple juice, 2 baked potatoes, cookie	12	3.5	44.6	7.1
Average		15.7	8.62	89.74	3.28

4) They create a second spreadsheet table. Assist them to enter in a formula to calculate the percents of RDA in their lunches. (use the = sign before the formula)
(see below)

Nutrients in grams	Your RDA (from the web site)	Your Average Grams (From your spreadsheet	% of recommended (RDA) you had (your average/RDA) x 100
Protein	73	8.62	12%
Carbohydrates	267	89.74	34%
Fat	39	15.7	40%
Fiber	22	3.20	15%

5) Students create two circle graphs to show the data from the spreadsheets.
   - One circle graph for their own weekly average amounts of nutrients taken at lunchtime.
   - The second circle graph should show their RDA of the nutrients.

   (To create the circle graph, highlight the specific data column and go to charts and graphs. Follow the directions from there.)
6) Students analyze their data and explain the circle graphs.
7) Students try to match their RDA graph by eating a nutritionally balanced lunch, recording and researching the nutritional data, creating a circle graph and comparing.

Pre 4.0a School Lunches

Questions to think and talk about: What is a healthy lunch? What are the essential nutrients for the human body and why? How much of these nutrients will make a healthy diet?

At the conclusion of this investigation, you will submit these work pages, your graphs, and your conclusions as a completed project. Please collect and organize all information.

1) Data Collection: Record what you eat for lunch for one week. Then research information about the food and your "recommended dietary allowance" (RDS) on the internet:
2) Record your information on a spread sheet. Then calculate your averages for the week.

	Foods Eaten	Grams of Fat	Grams of Protein	Grams of Carbohydrates	Grams of Fiber
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Average	XXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXX				

3) Create a second spread sheet to compile the information below.

Nutrients in grams	Your RDA (from the web site)	Your Average Grams (From your spreadsheet)	The % of recommended (RDA) you had. (your average/RDA) x 100
Protein			
Carbohydrates			
Fat			
Fiber			

4) Create two circle graphs using the spreadsheet data.
   - Highlight your own averages column. Go to charts and graphs and create the circle graph. Label the graph "_____'s" daily averages (use your name)
   - Highlight your own RDA column. Go to charts and graphs and create the circle graph. Label the graph "_____'s" RDA. (use your name)
   - Print the graphs or draw below.

5) Analyze your data and your graphs.
   - About what % of your RDA would you expect to have during lunch? Why?

   - How close were you to what you should have?

   - Compare your average and your RDA graphs. Explain what you learn from these circle graphs about your diet.

   - Using what you know about fat, protein, carbohydrates, and fiber in the diet, what is good about the way you are eating now? What should change?

6) Now that you have had a chance to analyze your diet, collect data for lunch for one more day. Try to eat a nutritionally balanced lunch. You want to see if you can make your one day lunch pie chart match your RDA numbers and chart. Research the nutritional data.

One-day lunch foods eaten	Grams of Fat	Grams of Protein	Grams of Carbohydrates	Grams of Fiber

7) Record the data from above onto a spreadsheet. Create a circle graph. Label this graph "_____'s" Improvement Lunch.

8) Compare your "improvement lunch data and graph with those from above. Using your data and your graphs, explain whether or not you improved your diet.