

Using Authentic Problems and Internet Resources to Teach Healthy Eating

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Introduction

Adequate nutritional knowledge may be able to influence the food habits that children develop and carry throughout their lives. Since children develop eating habits at an early age, it is important that they are armed with appropriate information regarding healthy food intake. An understanding of the role that food plays in their overall health is important to allow them to make better food choices. Lifestyle practices such as food intake and activity patterns have been linked with the development of obesity and chronic disease in both adults and children.

Everywhere we turn, the problem of obesity in the United States is apparent. Currently, it is estimated that over sixty percent of the adult population is either overweight or obese. Of great concern is the increasing rate of obesity in children. The CDC estimates that in 2004 the rate of overweight among children ages 6-11 was 18.8% (CDC, 2009). Since food intake is one of the factors related to the rise in obesity and overweight, it is important to introduce nutritional knowledge at the elementary school level and to build upon it in middle and secondary school.

Providing authentic problems as a method of instruction is supported by cognitive apprenticeship theory. This theory, advanced by Brown, Collins and Duguid (1989), suggested that didactic methods of learning separate the activities of knowing and doing. In this situation knowledge is regarded as a separate entity apart from any relationship to actual practice. Brown, et.al. (1983) advocated that students learn best when they take on the role of the practitioner and enter the community in which the knowledge will be utilized. This cognitive apprenticeship enables the learner to participate in authentic activity thus providing meaning to the learning that is taking place.

Providing authentic problems to students also produces a student centered learning environment (SCLE) advocated by Jonassen (2000), in which learners are provided with a question, issue, case, project or problem that they attempt to solve. The difference between SCLEs and traditional instruction is that the problem directs the learning. The important characteristics of the problem presentation include that it be interesting, engaging and relevant. This necessitates that the problem be ill-structured to allow students to take ownership of their learning as they engage in finding a solution (Jonassen, 2000). Research on this type of learning indicated that students have a better ability to transfer information from the classroom to real life situations (Hung, et.al., 2003).

Therefore providing authentic problems that explore guidelines for healthy eating will allow students to learn about nutrition in an enjoyable and interactive fashion. The students will take advantage of resources that have been developed by the USDA and various health education entities to conduct their research to solve the authentic problem. These resources are available to students and teachers on the internet free of charge or for a minimal charge. The advantage of using these resources is that they eliminate the need for the time consuming and costly endeavor of designing new teaching materials. These resources also allow students to increase their familiarity with using the internet to find valid information. The three authentic problems provided in this document are targeted at elementary, secondary and advanced levels. The complexity of the problems could be tailored to the specific needs of the desired audience. A variety of internet resources are also provided for each problem. Since these modules rely on the availability of a

computer and access to the internet, they could be implemented in either the home or in the school computer lab whenever the appropriate technology is available.

Elementary Problem

Your school cafeteria has been charged by the food police with not serving the right foods. The school principal is conducting a contest to see what student team can develop the best and most nutritious menus for the cafeteria. It is your job to first learn about what foods you need to include in a balanced diet with your team. You must begin your quest about healthy foods by investigating the ChooseMyPlate guidelines that are appropriate for your age group. Your team must develop the meals/menus using all of the food groups in the ChooseMyPlate guidelines to assure that the meal is balanced and adequate to meet your nutritional needs. Once you have developed your menus your team will need to present them to the rest of the class in the form of a “commercial”. The purpose of this “commercial” is to share your understanding of the food groups in the menu and to advertise why the foods that you have chosen are healthy choices. You may either act out your commercial or make a video of it to present to your class.

Learning Objectives

After completion of this problem the students will be able to:

1. Distinguish between healthy and less healthy foods.
2. Briefly explain what a calorie is and why your body needs them.
3. State what food groups make up a balanced diet.
4. List five healthy foods and five less healthy foods.

5. Identify where foods they eat fit into the ChooseMyPlate food groups.
6. Plan healthy menus for the school cafeteria or home use.

The websites below provide a variety of print, audiovisual and interactive games to present content to the learners as they explore good nutrition.

Interactive Video Instruction

<http://www.brainpop.com/health/nutrition/nutrition/>

Online Print Resources

<http://kidshealth.org/kid/nutrition/food/pyramid.html>

http://kidshealth.org/kid/nutrition/food/go_slow_whoa.html

http://kidshealth.org/kid/stay_healthy/food/calorie.html#

Interactive games

Learn to Be Healthy-membership in this website allows access to interactive games on nutrition and other health topics. A teachers section provides lesson plans for use of these activities at home and in the classroom <http://learntobehealthy.org/kids/>

<http://learntobehealthy.org/parents-teachers/>

ChooseMyPlate.org is the USDA website that provides nutrition information for consumers. This link takes you to the section specifically designed for children and includes the

<http://www.choosemyplate.gov/children-over-five.html>

[Amazing Food Detective](#) - an interactive nutrition game featuring the player as a junior detective

<https://members.kaiserpermanente.org/kpweb/richmedia/feature/amazingFoodDetective/index.htm>

[Dairy Council Kids Game](#) — games related to dairy and nutrition from the Dairy Council of California <http://www.dairycouncilofca.org/Tools/MyPlate/>

[Dining and Decisions](#) — online game about healthy food choices from the U.S. Department of Health and Human Services

http://www.bam.gov/sub_foodnutrition/index.html

[Food: A Fact of Life](#) — over twenty games about food and nutrition

<http://www.foodafactoflife.org.uk/Activity.aspx?siteId=14§ionId=61&contentId=55>

[Food Fury](#) — a game to teach the basics of a balanced diet

<http://www.playnormous.com/games/food-fury>

[Food Groups Game](#) — place each food in its proper category in this game from Sheppard Software

<http://www.sheppardsoftware.com/nutritionforkids/games/foodgroupsgame.html>

[Fruit and Veggie Color Champions](#) — free nutrition games for very young children

<http://www.foodchamps.org/>

[Great Grub Club](#) — World Cancer Research Fund site with several nutrition games for kids

<http://www.greatgrubclub.com/my-packed-lunch>

[Nourish Interactive](#) — free registration is required to access this site full of nutrition games

<http://www.nourishinteractive.com/>

[A World of Activities](#) — seven fun games all about nutrition for kids

<http://www.nutritionexplorations.org/kids.php>

This is the rubric for grading the student's final presentations.



Name: _____

Teacher: _____

Date : _____

Title of Work: _____

Objectives	Criteria				Points
	1	2	3	4	
Students incorporated all 5 of the food groups in the meal to assure that the meal is balanced and adequate to meet their nutritional needs.	Students were able to incorporate 1 to 2 food groups.	Students were able to incorporate 3 food groups.	Students were able to incorporate 4 food groups.	Students were able to incorporate 5 food groups.	_____
Students are able to explain why their meal is healthy by backing it up with explanations from the reading and interactive videos and games.	Students gave none to 1 example why their food should be chosen.	Students gave 2 examples why their food should be chosen.	Students gave 3 examples why their food should be chosen.	Students gave 4 or more examples why their food should be chosen.	_____
Students were persuasive in justifying why their food was better and healthier than	Students were not persuasive and gave no examples of other foods their fellow students eat and no detail why their meal	Students were persuasive and gave 1 example of other food their fellow students eat and explained a	Students were persuasive and gave 2 examples of other foods their fellow students eat and	Students were persuasive and gave 3 or more examples of other foods their fellow students	_____

other foods. Students will be able to compare their meal to other meals that are regularly eaten by fellow students.	is better and healthier.	little detail why their meal is better and healthier.	explained in some detail why their meal is better and healthier.	eat and explained great detail why their meal is better and healthier.	
Oral presentation of video was clear and easy to understand. Students had sufficient knowledge of subject matter.	Students could not be heard well on presentation. Subject matter was not clear and understood.	Students spoke but some parts were hard to hear and understand. They spoke with some confidence and little knowledge of subject matter.	Students spoke clear and loud so it was easily heard. They spoke with some confidence and knowledgeable of subject matter.	Students spoke clear and loud so it was easily heard. They spoke with confidence and knowledgeable of subject matter.	—
Students worked together well as a team.	Student collaboration did not go well and mediation was needed from the teacher.	Some students worked together ok but some students did not. There was no to little sign of group working together.	All students worked participated but did not work together well as a group.	All students participated in project and worked together.	—
				Total---->	—

Teacher Comments:

Secondary School Problem

Case of the High School Athlete

You are the captain of the high school tennis team and were really looking forward to a winning season until you noticed a problem with one of the star players. Abby is a 16 year old junior who is usually full of energy during the hour and a half at tennis practice after school. This season however you notice that she just isn't keeping up with the rest of the team and the rest of the team isn't outstanding either. On most days Abby begins to get tired after about 20 minutes of practice. You don't want to get too worried but you decide to talk to the coach about how to handle the situation. Since the coach is concerned too you decide to have a conversation with Abby during a free period the next day. You find out that over the summer Abby started to work for a modeling agency and has become really concerned about her overall looks and weight. She has been trying to eat less than usual to keep her weight down and doesn't seem to understand that she needs a balanced diet to play well on the tennis court. As you and the coach continue to talk to Abby you begin to think that maybe the other girls on the team have similar concerns. You wonder what their usual diets are like. The next day you decide to quietly observe what the other players have for lunch. What you see is not exactly evidence of wise food choices. You ask the coach for his permission to call a meeting after practice to talk more about what the players eat. In this meeting you find out that many of the players don't seem to have a good idea of a healthy intake. Some of the players claim that they are vegetarian and eat salads most of the time. Others are proclaimed junk food junkies and live on French fries and Cheeseburgers. Some of the girls have decided that

they are too old to drink milk. In fact many of their diets look like the meals listed below:

Breakfast 6:30 AM

Gatorade (8 Ounces)

Granola Bar or Cereal Bar

Dinner 7:00 PM

Lunch 11:30 AM

Macaroni and Cheese or Other Pasta
(1cup)

French Fries (about 40 Fries)

6 Chicken Nuggets

Large Green Salad (2 Cups)

Diet Coke

Italian Dressing (1/4 Cup)

Apple Juice (16 Ounces)

Snack 9:00 PM

After School Snack 2:30 PM

4 Chocolate Chip Cookies

Candy Bar (1)

After seeing how the team is eating you decide that everyone would really benefit from learning more about healthy eating. You recruit some of the other players to help you research and plan an interesting and informative presentation for the team.

Here are some resources that you can use to begin your research

[ChooseMyPlate.gov](https://www.choosemyplate.gov) this is a good place to start to find out about healthy balanced eating.

[Sports and Nutrition the Winning Connection](https://www.choosemyplate.gov/sports-nutrition) this website is good resource for sports nutrition.

Advanced Nutrition Problem

Diet and Disease Problem

Purpose and Learning Objectives

The purpose of this case study is to increase your knowledge and understanding about diet and disease so that you can become effective patient educators. In order to effectively prepare you for this role it is important that you acquire the following competencies:

1. A thorough understanding of the relationship of dietary fat intake to blood lipids and heart disease risk.
2. An understanding of the relationship between diet, lifestyle and blood sugar and blood pressure control.
3. A working knowledge of food composition in relationship to types of fat as well as dietary recommendations for a Heart Healthy Diet as defined by the American Heart Association .
4. An understanding of the relationship between dietary treatment for lipid disorders and for elevated blood sugar based on the recommendations of the American Heart Association and the American Diabetes Association.
5. The ability to access relevant online resources that you can utilize in clinical practice.

The learning objectives for the module are as follows:

1. The learners will distinguish between the different types of fat in the diet and indicate food sources of these fats.
2. The learners will identify the relationship between dietary lipid intake and blood levels of cholesterol.

3. The learners will identify the relationship between diet and lifestyle factors to changes in blood sugar and blood pressure.
4. The learners will be able to state acceptable levels of blood glucose, blood lipids and blood pressure as defined by the American Diabetes Association and the American Heart Association.
5. The learners will be able to state acceptable levels of blood lipids in a blood lipid profile.
6. The learners will describe the basic elements of a Heart Healthy Diet for achieving/maintaining healthy blood lipid levels and minimizing the risk of cardiovascular disease.
7. The learners will be able to plan an acceptable menu for an individual following a heart healthy diet in a restaurant and home setting.
8. The learners will be able to create a teaching tool that could be used to convey the knowledge obtained to patients.

Diet and Disease Problem

Introduction and Instructions

You are a member of the nursing staff at a busy family practice in a suburban area. The staff at the clinic has noticed an increase in patients with similar medical problems. At a recent staff meeting you begin discussing, M.G., one of these patients. The consensus among the staff is that M.G. lacks information regarding her disease risk and how it relates to her lifestyle. The group decides that this patient and others like her would benefit from education to help them understand how lifestyle and other factors affect their medical problems. For this reason you and your colleagues decide to form an Education Task Force to develop an educational tool to use with patients like M.G. in the clinic. The Task Force decides to use M.G. as the model for designing the educational tool. First however you must gather information to design the tool. As a group you decide that you will need to explore information about diet, lifestyle, heredity and disease using M.G.'s medical, diet and personal history as a starting point for your search. Gathering more information in these areas will allow you to design a tool (pamphlet, video, PowerPoint) to use for educational purposes in the clinic.

It is important that you be as thorough as possible in completing this assignment with your group members. In order to facilitate communication with your group members I will create a group area for each group on Blackboard. This area can be used to share information and resources as you work to complete the case study. It is the responsibility of each group member to show evidence of their contribution to the project by sharing resources in this group area. I will use the group area to evaluate the individual contributions of each group member.

As previously stated, the final product of this case study is a teaching tool that your group designs. Your group should submit the completed case study and the teaching tool to the group area on Blackboard by midnight on the due date. Each individual should submit their individual contribution to the final product to the group area file exchange by the designated due date as well.

Process

Your group will act as the Education Task Force that needs to make a plan to develop an educational tool to help patients like M.G. The members of your task force should each take on one of four separate roles-a medical history and lab expert, a diet and disease expert, and a food composition/menu planning expert and a summarizer/editor. If your group consists of four individuals you may each assume one of the roles described below. If you are a group of two each of you will need to assume one primary role and divide up the responsibility for the remaining role.

Role Responsibilities

Medical History and Lab Expert-this role has the primary responsibility of researching information about the relationship between the patient's medical history and the development of heart disease and diabetes. This role is also responsible for identifying normal and abnormal lab values and how they relate to the development of disease.

Diet and Disease Expert-this role has the primary responsibility of researching the characteristics of the diet that is used to treat the medical problems being experienced by M.G. and patients like her. This role will bring information to the team regarding the best diet for these individuals to follow to achieve optimal health.

Food Composition/Menu Planning Expert-this role has the primary responsibility of researching the specific types of foods that are appropriate to be consumed on the diet identified above. It will also be necessary to determine what foods need to be avoided or consumed very infrequently. This role will work on developing a specific sample meal plan for use by patients in the clinic.

Summarizer/Editor-This role is responsible for working with the other three group members to coordinate and assimilate the information that each individual has gathered. The ultimate goal of

the role is to put together a cohesive end product and not simply a “cut and paste” of the information that the other group members have gathered.

Each expert should bring the results of their research back to the group for discussion, planning and development of the final teaching tool.

Before you can design the teaching tool your task force needs to complete the other tasks listed below. In the process of completing these tasks you will need to do the following:

1. Discuss learning issues related to the problem in your group. Here you can share any prior knowledge related to diet, lipids, heart disease, blood pressure and blood glucose.
2. Identify additional learning needs to complete the tasks and produce the educational tool for the clinic.
3. Use the resources provided and additional resources as desired to research the problem individually in your assigned role and in your groups to work toward your completed product.
4. Discuss your research findings in your group and come up with a plan to create your final product. Remember the goal of your research and the tasks is to find the information necessary to create an instructional tool of your choice (pamphlet, video, PowerPoint) that could be utilized in patient education. The tool that you create must be an original tool and not simply an adaptation of another educational material that is currently available. You must also cite all references used in the construction of your final product.

Patient Medical History

M.G. is a 38 y/o African American female who presents to her primary care physician with a complaint of being “tired all the time”. It’s been going on for several months, and she doesn’t report any concerns with nighttime sleep except for getting up frequently to use the bathroom. She feels that this is happening because she has been drinking more during the day due to increased thirst. She doesn’t note any new stress or other life changes, and denies depression or anxiety. Alcohol consumption is limited to one to two drinks per week, and she quit smoking a

few years ago. Family history is notable for type 2 diabetes in an older sister and her mother had “heart disease.” She walks about 20 minutes three times weekly when the weather allows. She has been told on previous visits that her blood pressure is elevated and has been advised to limit her sodium intake. On this visit the following information was recorded for M.G.:

Height:5’4”
Weight:212 lbs.
BMI:36
BP:135/86

Labs:

Fasting Blood Sugar: 200mg/dl
Total Cholesterol: 250mg/dl
HDL Cholesterol: 35mg/dl
LDL Cholesterol: 170mg/dl
Triglycerides: 180mg/dl

As part of your research for developing an educational tool you will need to find out more information about the following:

1. The symptoms that the patient is exhibiting.
2. The importance of her family history.
3. The significance of her lab values.
4. The relationship of her lab values to her problem and to her lifestyle choices.

Patient Diet History

Your group realizes that there is some relationship between a patient’s diet and their overall health but you need more information to help them better understand this relationship. The typical patient, M.G., should be your guide as you explore the characteristics of her diet given below. Suggest the changes she might want to make in her restaurant meals and explain the rationale for the suggested changes. Your group should use the tables provided to gather information about her intake.

M.G. is single and works full time in sales. Her job makes it necessary for her to travel often and she frequently eats out.

A recent day consisted of the following meals:

Breakfast at Hardees

Hardees Low Carb Breakfast Bowl , Coffee with Cream and Sugar

Lunch at Chick-fil-A

Chick-fil-A Chicken Salad Sandwich Large Lemonade, Small Serving of Waffle Fries

Dinner at Chili's

Hot Spinach and Artichoke Dip with Chips, Boneless Buffalo Chicken Salad, Red Wine

Complete the chart below using nutrition facts from these restaurants and food composition tables. Place NA in a box if the information is unavailable.

Food Item	Calories	Fat	Saturated Fat	Transfat	Cholesterol	Carbohydrate
Low carb breakfast bowl						
Coffee with 2 tsp. of sugar and ¼ cup of half and half						
Chicken Salad Sandwich						
Waffle Fries						
Lemonade						
Hot Spinach Dip & Chips						
Boneless Buffalo Chicken Salad						
Red Wine 8 ounces						
Totals						

<http://www.hardees.com/menu/>

<http://www.chick-fil-a.com/#nutrition>

Totals						

Your group would like to help patient learn more about planning healthy meals at home. In order to do this you decide that you will need to explore more information about heart healthy eating and balanced nutrition. To help you convey this information to your patients you will need to plan a balanced and healthy menu that could be prepared easily at home.

Breakfast

Lunch

Dinner

The Education Task Force has gathered a wide variety of information about diet and disease as they have worked through the sample case of patient M.G. Now it is time for the group to assemble all of this valuable information into a teaching tool that can help M.G. and other patients have a better understanding of the relationship between diet, lifestyle and disease and the changes they could make to benefit their health. As a group prepare this tool being sure to include all of your findings in a way that would be helpful to the patients in your clinic. You may design a pamphlet, video or PowerPoint as the vehicle for this tool. Please refer to the rubric below to help you include all of the required areas in your final product.

The following is a list of resources that you may want to utilize as you complete this problem. This is a good place to start your research but please remember to look for other sources and cite your sources in your final project.

Suggested Resources

Websites

American Heart Association <http://www.heart.org/HEARTORG/>

American Diabetes Association <http://www.diabetes.org/>

National Heart Lung and Blood Institute <http://www.nhlbi.nih.gov/>

National Cholesterol Education Program <http://www.nhlbi.nih.gov/about/ncep/index.htm>

Centers for Disease Control <http://cdc.gov/>

Videos

Cholesterol and Fats in Your Blood <http://www.uctv.tv/search-moreresults.aspx?catSubID=70&subject=health>

Lipoprotein Physiology on You Tube <http://www.youtube.com/watch?v=xAqL9fLwnDs>

<http://www.youtube.com/watch?v=9u8YSD6StOg&feature=channel>

<http://www.youtube.com/watch?v=4D6CqHpvVz8&feature=channel>

<http://www.youtube.com/watch?v=4nXPQo4FdL8&feature=channel>

There are many other resources related to diet and disease on the internet that you might want to investigate. When viewing websites it is important to make sure that they are accurate, scientifically based and legitimate. You can use the following guidelines to assist you in this determination.

<http://webquest.sdsu.edu/processguides/HowToPrimaryS.html>

Grading Rubric

Objectives	Criteria				Points
	1	2	3	4	
The educational tool will distinguish between different types of fat in the diet and indicate food sources of these fats.	Learners were able to indicate the fat composition of one food group.	Learners were able to indicate the fat composition of two food groups..	Learners were able to indicate the fat composition of three food groups.	Learners were able to indicate the fat composition of four food groups..	—
The educational tool will identify the relationship between dietary lipid intake and blood lipid levels.	Learners will explain the relationship of one type of dietary fat to blood lipid levels.	Learners will explain the relationship of two types of dietary fat to blood lipid levels.	Learners will explain the relationship of three types of dietary fat to blood lipid levels.	Learners will explain the relationship of four types of dietary fat to blood lipid levels.	—
The educational tool will state acceptable levels of blood lipids in	Learners will state normal and abnormal levels of one element of	Learners will state normal and abnormal levels of two elements of the	Learners will state normal and abnormal levels of three elements of	Learners will state normal and abnormal levels of four elements of	—

a blood lipid profile.	the blood lipid profile.	blood lipid profile.	the blood lipid profile.	the blood lipid profile.	
The educational tool will describe the elements of a heart healthy diet for decreasing heart disease risk.	Learners will describe one parameter of a heart healthy diet.	Learners will describe two elements of a heart healthy diet.	Learners will describe three elements of a heart healthy diet.	Learners will describe four elements of a heart healthy diet.	—
The educational tool will provide an example of acceptable menu for an individual following a heart healthy diet in a restaurant	Learner's menus fit the criteria of a heart healthy diet by being low in total fat and saturated fat.	Learner's menus fit the criteria of a heart healthy diet by being low in total fat, saturated fat and cholesterol.	Learner's menus fit the criteria of a heart healthy diet by being low in total fat, saturated fat, cholesterol and high in fiber.	Learner's menus fit the criteria of a heart healthy diet by being low in total fat, saturated fat, cholesterol and high in fiber and omega 3 fats.	—
The educational tool will provide an example of acceptable menu for an individual following a heart healthy diet in a home setting	Learner's menus fit the criteria of a heart healthy diet by being low in total fat and saturated fat	Learner's menus fit the criteria of a heart healthy diet by being low in total fat, saturated fat and cholesterol.	Learner's menus fit the criteria of a heart healthy diet by being low in total fat, saturated fat, cholesterol and high in fiber.	Learner's menus fit the criteria of a heart healthy diet by being low in total fat, saturated fat, cholesterol and high in fiber and omega 3 fats	
The educational tool will provide evidence of an understanding of appropriate diet for control of blood sugar	Learner's menus the criteria of a diet appropriate for blood glucose management by being low in simple sugar.	Learner's menus fit the criteria of a diet appropriate for blood sugar management by being low in sugar and high in fiber.	Learner's menus fit the criteria of a diet appropriate for blood sugar management by being low in sugar and fat and high in fiber	Learner's menus fit the criteria of a diet appropriate for blood sugar management by being low in sugar and fat, high in fiber and adequate in calories.	
The educational tool will provide evidence of understanding normal blood sugar, blood pressure and BMI and how these relate to disease risk	Learners state the range of at least one normal lab value	Learners state the range of at least two normal lab values	Learners state the range of at least three normal lab values	Learners state the range of at least three normal lab values and the relationship to disease risk	
The educational tool will include	Learners include at least one accurate	Learners include at least two accurate	Learners include at least three accurate	Learners include at least four accurate	

an explanation of family and medical history to disease risk	explanation about family and medical history risk.	explanations about family and medical history risk	explanations about family and medical history risk	explanations about family and medical history risk	
The educational tool includes an explanation about the symptoms that the patient is experiencing	Learners include an explanation of at least one symptom	Learners include an explanation of at least two symptoms	Learners include an explanation of at least three symptoms	Learners include an explanation of at least four symptoms	
				Total	_____

Comments:

References

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