**Heart Attack Case: A Middle School Nutrition Project**


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**ABSTRACT**

Health and nutrition education are vitally important, particularly because of the growing problems that our nation is facing with health and nutrition-related diseases. Educating and training at an early age can prevent many health problems such as obesity, diabetes, metabolic syndrome and many others. We created a heart attack case to introduce middle school students to the knowledge of nutrition and how nutrition affects the body. The case begins with a family man whose diet is not ideal and that leads to a heart attack. As the family begins to understand nutrition and the effects of food, the story unfolds, the students begin asking and answering questions about heart attacks, healthy diets, the controversial food pyramid, correct portion sizes, food labels, the health impact of fruits and vegetables, exercise and its health benefits, the digestive system and circulatory system interaction, and the symptoms and prevention of heart disease. At the end of the case, as a way to evaluate the student's understanding and knowledge of the topic, a poster session will be held and each student will create a poster that answers one of these three questions: What is a heart attack? What are healthy food choices? How do they think the heart and the circulatory system function? At an additional way of evaluating the student’s grasp of the topic, an “open poster” written test will be given to test their knowledge of their poster as well as the other students’ posters.

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**SUMMARY OF THE CASE**

**DAY 1**

1. Day 1 is composed of two scenes. Bob is the father who eats poorly and has been warned about his health. Sandra, his wife, encourages him to start eating healthier. Jimmy, the high school son is introduced as well. In scene two, Bob has unusual pain in his left arm, notices is short of breath, and breaks out in a cold sweat, as he goes to pick Jimmy up from track practice. Jimmy notices something is wrong with his dad as Bob grabs his chest and collapses.

2. **DAY 2**

   - **Day 2 is composed of three scenes. Jimmy calls 911, and an ambulance comes and takes Bob to the hospital. They find out that Bob suffered a heart attack. The doctor tells the family about the posters they had for dinner last night and tell which category in the food pyramid it falls into.

   - **DAY 3**

   - **Day 3 is composed of one final scene.** The doctor tells the family about the posters that the middle school students are presenting, and suggests to look at the posters to learn more about living a healthy lifestyle. The final project is mapped out for the students in this final scene.

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**CASE OBJECTIVES**

1. To sharpen skills on how to research and how to present research findings to a group of peers.
2. To learn the digestive and circulatory system organ systems and their functions.
3. To learn what specific statistics on the body indicate good or poor health.

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**HOW WE ACCOMPLISHED**

1. Students were given a more directed type of research:
   - Specific research tools were given on how to present the research.
2. Students were given a webquest (see Student Handouts) to delve into these systems:
   - Learning issues gave rise to investigating these systems.
3. Students were given Bob’s health statistics, a food label (see Student Handouts), and diet information to analyze, research and make inferences regarding how they affect health and body functions.

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**FINAL PROJECT**

1. **Heart and Circulatory System**

   - How does blood flow through the circulatory system? What are the functions of blood? What is the coronary artery? What benefits are there to exercising? Especially concerning the heart? Other benefits? How long and how often should one exercise?

2. **Portion sizes and food pyramid**

   - What is the food pyramid? What are correct portion sizes—show examples? How does the digestive system work? What are food labels and how do they read them? Name all the food groups. Why are fruits and veggies important for health? Name 5 fruits and veggies and name their specific benefits.

3. **What is a heart attack?**

   - What are the risk factors for a heart attack? What are the symptoms? What is blood pressure and hypertension? What is a plaque? What is a blood clot? How does cholesterol affect the heart? What are some strategies to reduce the chances of a heart attack?

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**STUDENT HANDOUTS**

**Learning issues Checklist**

1. List websites or book or source used
2. Write research summary in complete sentences
3. Write 1/2 page to 1 page for each learning issue

**Digestive System**

- Answer questions and thoroughly understand the digestive system.
- Be ready to hand in on following Monday.
- a. If not turned in on due date, grade will be affected.
- b. If you won’t be here Monday, you must find someone else in your group to turn your learning issue in for you

**Learning Issues from Day 1**

1. What are nutrients? What are the different types of nutrients?
2. What are the correct serving sizes (proportions) of foods to eat?
3. How many serving sizes of veggies did Bob have?
4. How many servings of desserts (sweets and fats) did Bob have?
5. How many servings of veggies did Bob have?
6. How many servings of fruit?
7. How many servings of meat?
8. How many servings of desserts (sweets and fats)?
10. a. Click on "Nutrition Fats" and functions of the heart and blood.
    b. What is arteriosclerosis? What are some strategies to reduce the chances of a heart attack?
    c. What is a blood clot? How does cholesterol affect the body?

**LESSONS LEARNED**

- Organization is critical for PBL to have its full affect.
- Prepare facilitator guides that include expectations we have for the students, several possible data, hypotheses, questions and learning issues the students may come up with.
- Write out learning issues on paper for students.
- Give students some sources to help them search for their learning issues—middle school students may need more guidance than other ages.
- Post expectations and go over them thoroughly with students.
- Self and group evaluations help students to stay on task.
- Groups of 4 or 5 are great in middle school.
- Each group and each student is different.

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**Sample questions from a Webquest**

1. What does two things does saliva do to foods that enter our mouths?
2. Click on “Follow the Flow of Food” and answer the following questions:
3. What are the functions of the liver and gallbladder and how do they work together?
4. What is the food pyramid? What does a heart attack mean to you? What does it mean to you?
5. What is a heart attack mean to you?
8. http://www.fcmsdocs.org/HeartAttack

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**Bob’s statistics**

- Weight: 225lbs
- Height: 5’6’’
- BMI: 30.6
- Cholesterol: 230 mg/dL
- LDL: 195 mg/dL
- HDL: 35 mg/dL
- Age: 43 years
- Sex: Male
- Blood pressure: 140/90 mm Hg
- Diabetes mellitus: No
- Broke: No
- Family history: Bob’s sister, Bob’s dad died of a heart attack at age 60.
- Exercise: NONE

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**Circulatory System**

- What part of the heart does the oxygen-poor blood flow to?


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**Your Diet: Draw the food pyramid**

- Draw a picture of the heart and label these parts: right and left atria, right and left ventricle, aorta, inferior and superior vena cava
- http://www.fcmsdocs.org/HeartAttack

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**SUGGESTED LEARNING RESOURCES**

- http://www.fcmsdocs.org/PublicHealthInfo/heartattack.html
- http://www.fmsdocs.org/HeartAttack
- http://www.ccmf.org/health/foods.htm
- http://www.fmsdocs.org/PublicHealthInfo/heartattack.html
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**NUTRITION FACTS**

- http://www.fmsdocs.org/PublicHealthInfo/heartattack.html
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**WEBQUEST**

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