**SATURDAY SCIENCE LESSON PLAN SPRING, 2010**

**WEEK TWO**

**LEARNING OBJECTIVES**

* They will be able to recall the heart and its functioning within 3 minutes with a quiz.
* They will be able to list ingredients of 5 drinks after looking at ingredients labels during drink activity.
* Doing drink exploration, they will be able to compare and contrast the components of sample drinks including vitamins, minerals, fat, carbohydrates, and protein levels within 90% accuracy.
* They will be able to choose appropriate cups with different amount of sugars in proper order.
* They will be able to list digestive system organs on their worksheets at least 80% correct.
* Within watching digestive system video, they will be able to describe the basic functions of organs.
* They will be able to demonstrate their nutrition knowledge on posters based on their drawing food pyramids. They will be able to categorize nutrients into appropriate groups and use the food pictures in correct categories within 90% accuracy.

**INDIANA STATE STANDARTS**

3.1

 Students, working collaboratively, carry out investigations. They question, observe, and make accurate measurements. Students increase their use of tools, record data in journals, and communicate results through chart, graph, written, and verbal forms.

Explain: Students will work collaboratively for drink and food pyramid activities. They will generate question about nutrients, drink ingredients, and nutrient functions. They will draw food pyramid on posters.

3.1.4

Discuss the results of investigations and consider the explanations of others.

Explain: They will discuss what types of components drinks contain. They will also discuss the nutrient levels of all drink types and will debate which one is healthy or not.

3.1.5

Demonstrate the ability to work cooperatively while respecting the ideas of others and communicating one's own conclusions about findings. (Core Standard)

Explain: They will draw food pyramids in groups and respect the ideas of peers.

3.2.4

Appropriately use simple tools such as clamps, rulers, scissors, hand lenses, and other technology, such as calculators and computers, to help solve problems. (Core Standard)

Explain: They will use computers to answer their research project questions.

4.2.4

Use numerical data to describe and compare objects and events. (Core Standard)

Explain: They will compare the amount of nutrients of soft drinks by reading ingredients section.

### 4.4.9

Explain that food provides energy and materials for growth and repair of body parts. Recognize that vitamins and minerals, present in small amounts in foods, are essential to keep everything working well. Further understand that as people grow up, the amounts and kinds of food and exercise needed by the body may change. (Core Standard)

Explain: They will compare nutrients levels of drinks. They will recognize the importance of nutrients and their journey by watching digestive system video.

**MATERIALS**

* one canned coke
* one cartoon milk
* one bottle water
* one canned lemonade
* one bottle fruit juice
* one bottle energy drink
* 6 small Dixie cups
* Two cups of sugar
* 5 white posters
* 5 glues
* Crayons
* 8 copies of food picture papers
* 21 copies of parent sheet
* 21 copies of research plan paper
* 21 copies of digestive system organs sheet
* 21 copies of food guide pyramid sheets

**Teacher Content Knowledge**

Human eat in order to gain energy, to build and nourish cells. We take nutrients into our body with foods. Foods contain carbohydrates, fat, protein, minerals, and vitamins. Meat, chicken, fish, milk, cheese, egg, some cereals, vegetables, and fruits contain protein which helps for grow and build new cells. Vegetables fruits, grains, and fish are main sources of vitamins and vitamins works for immune system. Carbohydrates, which produce body energy need, mostly found in meat, poultry, grain, sugar. Fat, which fuel the body, helps to absorb some vitamins, and helps to build hormones, and insulate nervous system tissues of body, are mostly found in different kinds of oils, meat, butter, milk, cheese, and fish. Minerals helps our body grow including building strong bones, teeth, and functioning of nervous system. Different foods have different level of minerals. For example, milk is a good source for Calcium and meat is a good source for Iron and Zink.

Some nutrients need to be digested and digestive system breaks down foods. Digestive begins in mouth. We chew and grind up foods with our teeth. The mechanic digestion of food and the chemical digestion of carbohydrates begin in mouth. Moistening saliva which contain special digestive proteins; enzymes also helps for the process of chemical digestion. Tongue helps for swallow food to esophagus. Esophagus is a transaction part between mouth and stomach.

Stomach stores food and helps digestion. Stomach includes enzymes; pepsin which breaks down protein and lipase which breaks down fat. The Hydrochloric acid of stomach helps for physical digestion and also helps to kill potentially harmfully bacteria. The next station is small intestine, which has several other enzymes, also breaks down protein, fat, and carbohydrates. Some other associated organs help to digestion including pancreas, liver, and gall bladder. The

The next station is large intestine which absorbs broken nutrients and water into blood. What is left from digestion is called as feces and sent out from anus which the last organ of digestive system.

**Description of lesson**

**Introduction**

Gain Students Attention –

The quiz of heart will attract the students’ attention since it is designed for 3rd-4th level kids with enjoyable music and colorful page design. (<http://kids.nationalgeographic.com/Games/PuzzlesQuizzes/Quizyournoodle-the-heart>). The questions on the quiz will be answered orally. This activity will remind students what they already learned about heart rate and being a fit kid.

**EXPLORING NUTRITIONS**

For drinking activity; students will be circled around the table where the activity will occur. They will be able to engage in activity. The students will be asked “Which drinks include calcium?” We expect students to say “Milk” among drinks. Then, we will write “Milk has calcium on the board.” We will start the activity with “calcium questions.” We expect students to produce some other questions related to nutrients which they will have learned before. They should be able to ask these kinds of questions;

* Which drinks include mineral?
* Which drinks include vitamin?
* Which drinks include sugar?

We except students to ask “sugar” question. (If they do not we will ask another question to initiate the discussion such as “Which drinks include carbohydrate?”) Then, we will read the sugar amount from the “ingredients” sections of drinks and write them on the board. Then, they will be able to figure out which drink has more sugar. Then, we will show them 6 small cups which have different amount of sugar. (One has no sugar)Then, we will ask them to figure out which cup belongs to which cup. We expect them to choose the 4 cups (which have more sugar) for fruit juice, energy drink, coke, and lemonade. We expect them to choose empty cup for water. We expect them to choose the last cup for milk (which has less sugar than others). As a result, they will be able to figure out sugar levels in different drinks. They will also be able to compare the other ingredients. For instance, they will learn that fruit juice has sugar as much as coke has. However, they will be able to figure out that fruit juice contains vitamins as well and come to understand that it is healthier than coke. They will also gain general idea about different nutrients groups which prepare them to learn the functions of nutrients and digestive system in the next step of the lesson.

**EXPLAIN**

Discuss what students learned about the amounts of different nutrients in 6 different drinks. They should be able to generate sub questions including;

Which soft drinks are healthy?

How much do I need to drink water per day?

Is coke unhealthy?

The teacher will create new questions or revisit the students’ questions to five detailed information about nutrients and digestive system. To make the answers clear, the instructor will give worksheets about food pyramid and nutrients. The instructors expect student to generate some other questions related foods and digestive system. Then, a video about food journey and digestive systems will be opened from a website which helps students to figure out answers to their questions. (http://kidshealth.org/kid/htbw/\_bfs\_DSmoviesource.html)After the video, each group will discuss the answers in small groups.

The video is a journey of an apple in the digestive system. It gives detailed explanation of digestion process; begin with mouth and end with anus.

**BREAK**

**ELABORATE**

The students will be divided into 5 groups to form their food pyramids. Each group will have 3 to 5 students. Each group will have a poster, glue, and some food pictures. Each group will draw food pyramid and make categories including carbohydrate group, fat group, protein group, vitamin group, and mineral group. The instructors expect students choose and stick appropriate pictures in appropriate categories after drawing food pyramids on posters.
After completing posters, one student from each group will explain what they drew and how they categorized these foods into groups.

The instructor will give the students 45 minutes to work on their group projects. They will ask their questions to instructors or search them on World Wide Web. The instructors expect them to create their own questions and find resources to use them during their projects.

**EVALUATION/ASSESSMENT**

* The students will be evaluated on the basis of their answers to heart rate. They should be able to give correct answers to all (or almost all) questions.
* The students will be assessed for identifying different sugar cups for different drinks.
* The students will be evaluated on the basis of their answers during the drink activity and food pyramid activity.
* They will also be evaluated based on worksheets of organ names.
* They will be evaluated on the basis of posters they draw. First, they will make evaluation based on other group posters and presentations. Then, the instructors will look if students put appropriate pictures in appropriate food categories and reapply the knowledge if needed.

**References**

http://dc.doe.in.gov/Standards/AcademicStandards/StandardSearch.aspx

http://digestive.niddk.nih.gov/ddiseases/pubs/yrdd/

http://kidshealth.org/kid/stay\_healthy/food/minerals.html#

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