November 13-16, 2017

Lesson Reflection – Digestive System Activity and Project

The main objectives for the digestive system was for students to be able to explain why organisms need food, how energy is extracted from nutrients in food, and the organs associated with the digestion process. The digestive system project built on the material from the previous sections, as well as added the component of how nutrients and molecules are able to flow through a system. Students needed to understand that there is an organization to organs and organ systems, as well as how our body can transport and use materials. After finishing notes on this system, an activity was gone through with students to walk though how food travels our digestive system and the role that each organ plays. Similar to my food web activity, students were given a note card. This time the note card was for a specific organ in the digestive system. The card also had an action written on it such as “STOMACH: \*break food bag apart\*.” Students were asked to explain the role of their organ before doing the action listed. This lesson and activity came toward the end of my student teaching experience.

I feel it is evident with this lesson that I have become a leading teacher and culminate many of the themes and domains in my teaching style and in my classroom. Leadership, diversity, and technology were all used in this lesson. I am creating a learning environment with the digestive system project that allows for varying student ability. If a student is more artistic, they can demonstrate this to me with a poster project highlighting their drawing skills. If students love to write, they could make a children’s book on the digestive system. Other models for this project included a game board, a D&D game, as well as a rap song and a poem.

With this project students were able to choose how they presented the digestive system and were able to work with 1-4 people in a group. As a leading teacher, I understand how all students learn and develop and have developed my style to demonstrate my ability to provide learning opportunities that support their intellectual, social, and personal development. School should be a fun place for students to come to every day and learn. As a curriculum designer, this project helps to display my ability to “create and modify a learning environment that encourages 1) active engagement in learning, 2) self-motivation, and 3) positive social interaction”. Additionally, I developed myself as an expert in school context. This project helped show how I understand and demonstrate the knowledge of subject matter, students’ needs, the community, and curriculum goals. One group did not use any of the time provided to do this project. The group left one student to complete the assignment the night before it was due. The students that did no work were asked to speak with myself and my cooperating teacher. These students were then given two weeks to individually complete the digestion project if they wished to pass the assignment. As an instructional leader, I was able to “understand the processes of planning, problem analysis and problem solving and participatory decision- making and was able to demonstrate the ability to build consensus among team, group and [department] members” on my decision of how to handle this issue.

Creating a rubric for this assignment helped further my curriculum designing abilities. It also showed me that development of lessons will always take place from year to year. If I were to do this project again in the future, I would put more emphasis on individual work for the project. Additionally, I would change my rubric to make it clearer. I feel like there was too much going on with the expectations of the assignment and this confused some students. Overall, I am proud of all I accomplished with this lesson.

Lesson Plan – Academic Biology [Digestion Project Intro and Activity]

Unit: Two – Matter and Energy Section:6 Digestion

Date(s)Project (Nov 14 – 16) Activity (Nov 15)

Grade Level: 10

Time Allotted: Project (4 class periods) Activity (15 minutes)

Objectives:

The students will be able to:

* Explain why organisms need food.
* Explain how energy is extracted from nutrients in food.

Standards: (NGSS Standards & Keystone Anchor Descriptors)

**BIO.A.2.2** = Describe and interpret relationships between structure and function at various levels of biochemical organization (i.e., atoms, molecules, and macromolecules).

* **BIO.A.2.2.1** = Explain how carbon is uniquely suited to form biological macromolecules.
* **BIO.A.2.2.2** = Describe how biological macromolecules form from monomers.
* **BIO.A.2.2.3** = Compare the structure and function of carbohydrates, lipids, proteins, and nucleic acids in organisms.

**BIO.A.2.3**  = Explain how enzymes regulate biochemical reactions within a cell.

* **BIO.A.2.3.1** = Describe the role of an enzyme as a catalyst in regulating a specific biochemical reaction.
* **BIO.A.2.3.2** = Explain how factors such as pH, temperature, and concentration levels can affect enzyme function.

**BIO.A.3.1** = Identify and describe the cell structures involved in processing energy.

* **BIO.A.3.1.1** = Describe the fundamental roles of plastids (e.g., chloroplasts) and mitochondria in energy transformations.

**BIO.A.3.2** = Identify and describe how organisms obtain and transform energy for their life processes.

* **BIO.A.3.2.1** = Compare the basic transformation of energy during photosynthesis and cellular respiration.

**BIO.A.3.2.2** = Describe the role of ATP in biochemical reactions.

Materials:

* Vocabulary Sheet – Section 6 (assigned)
* Guided Notes – Digestion (Section 6)
* Simulation – Digestion
* White Board
* Markers
* Pens/Pencils
* Digestion Project Rubric
* The Process of Digestion project guidelines
* Digestion project progress check

Pivotal Questions:

Students must answer the following questions as a summary that accompanies their project:

1. Why must all food be broken up into such small pieces during digestion?
2. How does the process of digestion help our body produce ATP during cellular respiration?
3. How does the process of digestion help our body grow?

Procedures:

Tuesday

* Students will participate in a Digestive System Simulation (15 minutes) run by the teacher
	+ This simulation will have been set up ahead of time following the directions provided at the end of the lesson plan.
	+ Students will follow the actions as outlined by the script the teacher reads to them (see end of lesson plan for script)
* Students will be introduced to the digestion project.
	+ Students will be told to organize into groups of no more than 4 students
	+ Students will be given “The Process of Digestion” project guidelines and rubric
	+ Students will have to choose and report the format of their project as well as their group members by the end of the class period.
		- Examples of format will be provided to the students.

Wednesday

* Students will work all period with their groups on the digestion system project
	+ Period 5 will have two periods of work time as this is their lab day
	+ At the end of this day ALL periods and ALL students will complete the Digestion Project Progress check handout and turn in as an informal assessment.

Thursday

* Students will work all period with their groups on the digestion system project
	+ Periods 2 and 3 will have two periods of work time as this is their lab day

Assessment(s)

* Informal Assessment –
	+ Students will be asked to complete the group peer evaluation form for their peers at the end of the project (following presentations)
	+ A Digestion Project Progress Check survey will be handed out to each of the students on Wednesday to assess how group work and collaboration is flowing.
* Formal Assessment –
	+ Students will be evaluated using the rubric provided to them for this project (attached)
		- The average of the score for group peer evaluation will be the students score for that area of the rubric for participation.

Accommodations/Adaptations:

**Adaptation –** Structured notes are considered and adaptation for many 504s in the class. However, each student is given them because each benefits from them. Students will be working as a group and have time in and out of class to work on the project. They may advocate for more time before and after school, or during study halls if they so choose.

Self Evaluation: **See attached.**

A Digestive System Simulation (15 minutes)

Things to make ahead of time:

 1. FOOD TUBE: Lay out two parallel lines of tape on the floor, 3'

 apart and long enough for half the class to stand

 shoulder to shoulder on one side of the parallel

 lines.

 2. FOOD PARTICLE: The food particle consists of M&M's placed in

 small zip-lock bags. These are placed in wadded

 newspapers in small paper sacks. Place the small

 sacks in larger sacks with added newspaper. Place

 all sacks and add newspaper until the large

 plastic bag is full. This bag is then taped or

 tied closed to complete the food particle.

Action of students:

 1. Peristaltic Movement: Put the food particle to be eaten at one end of the

 food tube and a large trash can at the other. Have students line up on

 both sides, facing each other, squeeze the food particle the length of the

 food tube.

 2. Digestion: Label and/or instruct the players (Note cards with parts). As the food comes to a

 student they should narrate what they are doing and why **(extension/evaluation**).

 Teeth - tear food apart (break plastic bag)

 Saliva - use spray bottles to moisten food particle

 Stomach - tear small bags apart

 Pancreatic juices - spray food

 Small Intestine - absorbs food, find bags of candy and pass to blood

 (the teacher can play the role of the blood)

 Large Intestine - reabsorbs water, sponge up water on the floor

 Rectum/Anus - puts the waste papers in the trash can

Student

Student

Student

Student

Student

Student

Student

Student

Student

Student

Student

Student

Teeth/Saliva Stomach Pancreatic Juices Small int Large int.