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Course: Education                                                                Date: 11-11-2012
Grade: 9th Grade        Topic: Ecology                      Content Are: Living Environment

**Instructional Objectives**
Following last night's homework and yesterday's intro to Ecology the students will understand how energy moves through the environment. Students will be able to construct and explain at least two different diagrams (food chain, food web, and energy diagrams) displaying specific types of energy flow at all trophic levels.

Key concept: Students will demonstrate their knowledgeof trophic structures and it's correlation to an organism’sexistence.
After going through the lesson students will analyze how energy moves through an ecosystem by drawing an illustration of how energy moves through the environment.
 **Standards and Indicators**

Science Standard #4
Students will understand apply scientific concepts, principles and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.
Common Core Standard#4
Reading Standards for literacy in Science grade 9-10 Analyze the structure of the relationships among concepts in a text including relationships among key terms.

Indicators
This will be evident when students illustrate and explain their energy flow diagrams and describing the different trophic levels, which will allow them to understand their impact on pollution and how we are all connected.

**Motivation**

The teacher will draw an illustrated story titled the boy and his apple, at the end of the story the teacher will then ask the students to determine who or what played the most important role of the story and why? Essentially, the students will see that all parts of the story are all vital and how they all are connected the pictures also depicts how energy flows through the environment which then leads into our lesson.

**Materials**

* Pens/pencils/crayons
* Computer/ internet
* Smart board
* Construction paper
* Rubric

**Strategies**

Use of class/group discussion and group work

**Adaptations**

For the student who have an visual disorder will be placed in front of the classroom, and given enlarged diagrams and notes of the lesson and assignments. That individual will also be assigned a buddy to facilitate his or her comprehension due to their visual acuity.

For the student who has attention deficit disorder the teacher will assign that student to record the information discussed within the group in his/her group assigned to help maintain the students' focus to the task.

**Differentiation of Instruction**

Tier One-students will be able to draw and explain at least two types of energy flow diagrams describing their correct trophic levels.

Tier Two-students will be able to analyze and construct all the variations of how energy moves through the environment stating all the correct trophic levels.

Tier Three-students will be able to analyze the estimated amount of energy used by an organism in each trophic level and how much energy is available for the next trophic level using a few key rules of thumb.

**Developmental Procedures**

1. Students will participate in a class discussion about the illustrated story of the boy and his apple via the motivation which will the lead into the lesson.
2. In a teacher lead discussion, the class will discuss the different types of feeding relationships and chemical cycles by use of the power point presentation and handouts.
3. Students will work on illustrating their own feeding relationship and/or chemical cycle diagram, with correct use of vocabulary and trophic levels, with an explanation.

**Independent practice**

For homework, students will choose one of the seven ecosystems, discuss and explain how energy may move through that ecosystem by choosing to be one of the elements of that system and describing its connection to the environment and other organisms, similar to the motivational story. Student must ensure they use vocabulary words. Student has a option of writing or performing their story as a skit, speech or illustration. See rubric for details.

**Follow-Up Academic Intervention and Academic Enrichment**

Academic Intervention: For students who have difficulty with the assignment, the teacher will provide one-on-one help during tutoring hours (before or after school).

Academic Enrichment:For students who easily complete the assignment they will have the opportunity to do an extra credit assignment if they so chose: to drawa diagram and explain one of the chemical cycles of an ecosystem.

 **Reference**

* *Common Core State Standards Initiative | Home*. (n.d.). Retrieved from<http://www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf>
* NYS Learning Standards:CI&IT:NYSED. (n.d.). *P-12 : NYSED*. Retrieved from<http://www.p12.nysed.gov/ciai/standards.html>