**BRAIN-TARGETED TEACHING**

**LEARNING UNIT**

**Name: Helen Markiewicz**

**Dates (Allocated Time):Six class and two block periods**

**Unit Topic:/Title: Photosynthesis: You are the Light of my Life**

**Grade Level: 10/11**

**Learning Unit Overview:** Students will apply understanding of Photosynthesis in discussions, activities and a culminating project centered around current environmental concerns regarding global warming.

***Brain Target #1***

**Emotional Connection: Daily Routine**

* Set daily predictable routine including greeting, homework check and daily objective displayed on board
* Use specific praise sincerely and often
* Students allowed choice of seats, partners and projects in this unit
* Provide plant books in “library” area of room
* Take field trip to school greenhouse

***Brain Target #2***

**Physical Environment:**

* Clean room and keep orderly with blinds raised for natural light
* Re-arrange desks to encourage collaboration
* Display student work-pertaining to plants-displayed when completed
* Use plants as decorations

***Brain Target #3***

**Concept Map / Advanced Organizer**

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**Introductory “Big Picture” Activity/Assessment of Prior Knowledge**

**Introductory Activity: S**tudents will use concept map for the term Photosynthesis. This serves to help students show prior understanding and help organize where new information about Photosynthesis and how its steps will fit in. The map will be visible and added to throughout the unit and daily updates will posted on class website.

**Learning Goals/Content Standards**

1. Demonstrate knowledge of how plants and other photoautotrophs use the energy of the sun to convert CO2and H2O to sugar and O2
2. Explain, show, label and discuss steps of how plants converts solar energy to chemical energy in The Light Reaction Phase of Photosynthesis
3. Explain, show, label and discuss how plants reduce CO2  sugar during the The Calvin Cycle
4. Demonstrate knowledge of how photosynthesis provides the energy and building material for ecosystems.

***Brain Target #4***

**Activities for Teaching Mastery of Declarative/Procedural Knowledge**

**Objective 1-**Demonstrate knowledge of how plants and other photoautotroph use the energy of the sun to convert CO2and H2O to sugar and O2
**Activities:**

* Sing Photosynthesis Song
* Revisit concept map for additions and discussion
* Read secondary source material to acquire additional and review known information about Photosynthesis

**Objective 2-** Discuss, show, label and explain steps of how plants converts solar energy to chemical energy in The Light Reaction Phase of Photosynthesis
**Activities:**

* Whole group phase one growing movement activity
* Venn diagram plate activity
* Independently read secondary source material to acquire additional information and review known information about Photosynthesis
* Revisit concept map for discussion and additions

**Objective 3-** Discuss, show, label and explain how plants reduce CO2  and sugar during The Calvin Cycle
**Activities:**

* Computer based animation model activity in pairs
* Independently read secondary source material to acquire additional information and review known information about Photosynthesis
* Complete second part of Venn diagram plate activity to compare and contrast phase one and two
* Revisit concept map for discussion and additions

***Brain Target #5***

**Activities for Extension and Application of Knowledge**

**After being given a real life practical problem students will use knowledge of Photosynthesis to creatively design a presentation showing a possible solution.**

* In pairs research global warming as related to “president plan”
* In pairs creatively  present the problem and a possible solution to class
* In pairs generate a 10 question quiz with answers demonstrating knowledge acquired

***Brain Target #6***

**Evaluating Learning**

* Understanding and engagement assessed by class discussion
* Understanding and engagement assessed by concept map participation
* Venn Diagrams assessed for accuracy upon completion
* Use of rubric to evaluate presentation
* Self generated quiz evaluated for accuracy
* Completing classmate generated quiz accurately