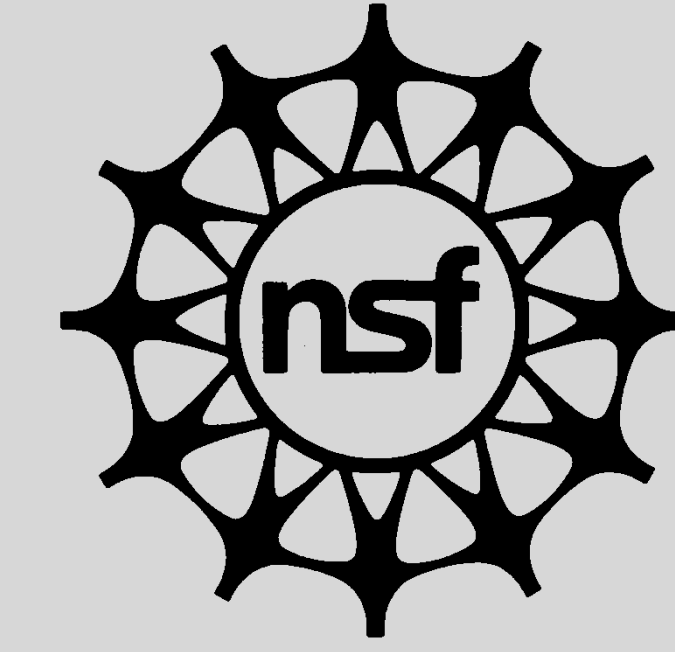
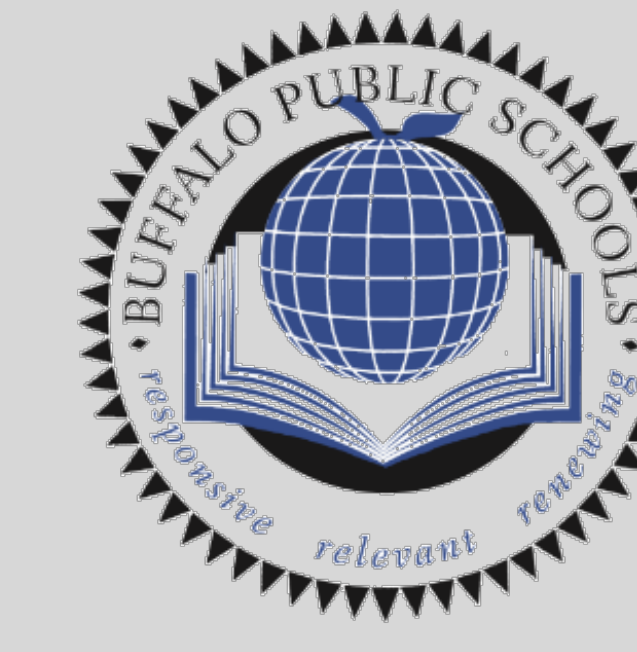


# Teaching English Language Learners the Nitrogen cycle via a freshwater fish tank

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## Research Proposal

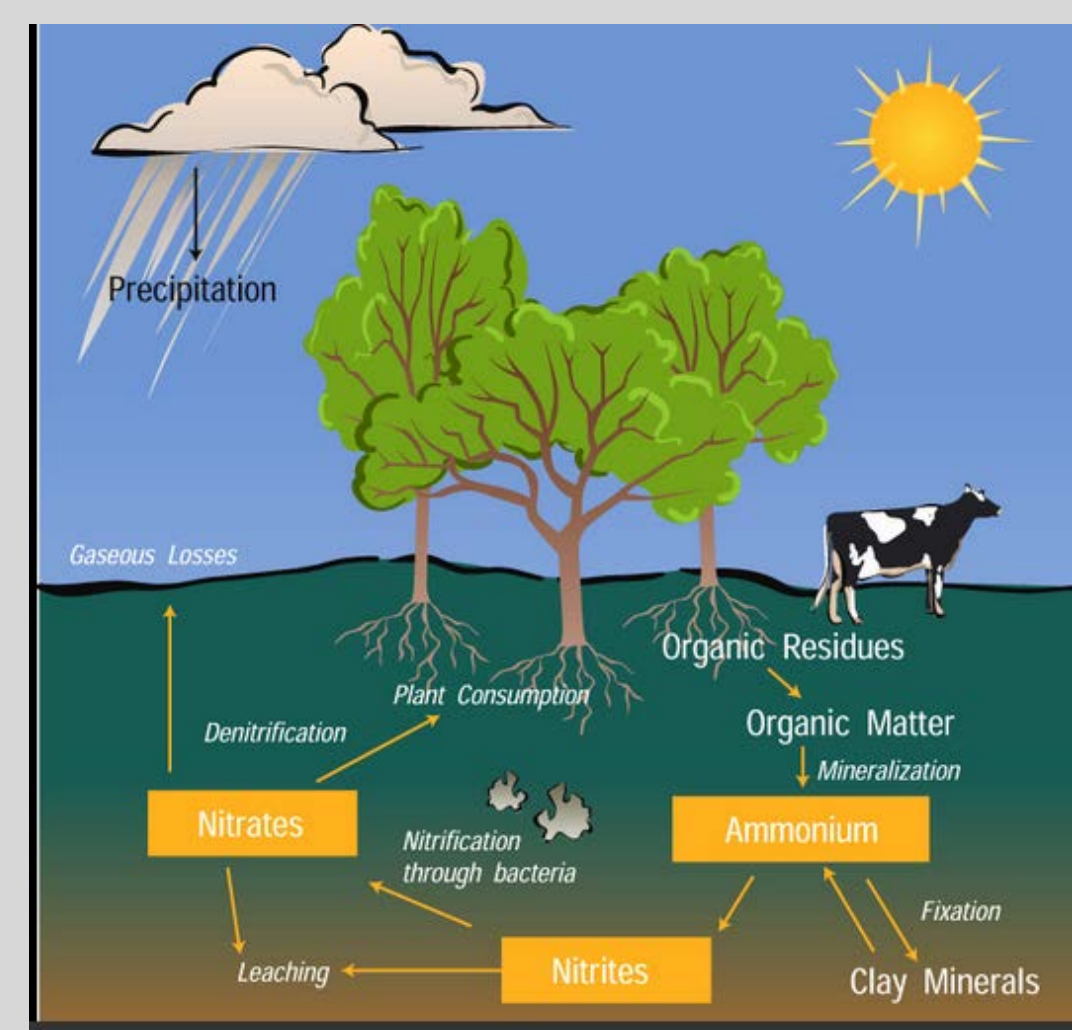
The number of English Language Learners have increased in the student population in the Buffalo Public Schools. This summer, a group of English as a Second Language teachers, both elementary and high school, a classroom middle school Science teacher, a UB student studying English and Linguistics and myself, a 5<sup>th</sup> grade classroom teacher, piloted a concept where we would develop curriculum that teaches English through Science. The English Language Learners are refugees from the following countries but not limited to: of Somalia, Burma, Vietnam, Congo, Thailand, Yemen and Iraq.

The research conducted this summer by this 5<sup>th</sup> grade teacher is an extension of the longitudinal study of pH started by Dr. Joseph Gardella and myself four years ago with my 5<sup>th</sup> grade class. The pH study is an annual study where 5<sup>th</sup> grade students collect precipitation samples around the school grounds at Native American School 19, learn how to use pH probe, collect samples and document their data.

This year in addition to learning how to test for pH, students will learn to test for Nitrates, Nitrites, and Ammonium as they form an understanding of the Nitrogen Cycle in a classroom freshwater fish tank. To add a touch of felicity to the project students will also learn about tubers plants, specifically lily pads. We will attempt to grow the lily pads in our fish tank as part of the Nitrogen cycle.

## Suggested Instructional Strategy

The English Language Learner has an increased chance to succeed when material is provided for them in a visual manner. Explaining content vocabulary and concepts becomes more real to them when this strategy is incorporated. In many instances they can then use their existing background knowledge to help clarify meaning. Before written vocabulary is presented in this unit, students are provided with visuals.



## I Do... We Do... You Do... Direct Instruction Strategy

This strategy is used throughout the unit after visuals have been provided. By proper modeling what is to be learned, then given opportunity to practice in a non threatening supportive environment, provides ESL students with confidence. Confidence is gained from group support by both teacher and peers. This leads to independent practice and individual learning. Content vocabulary often includes unknown word meaning along with unknown pronunciation a double challenge for ESL students.

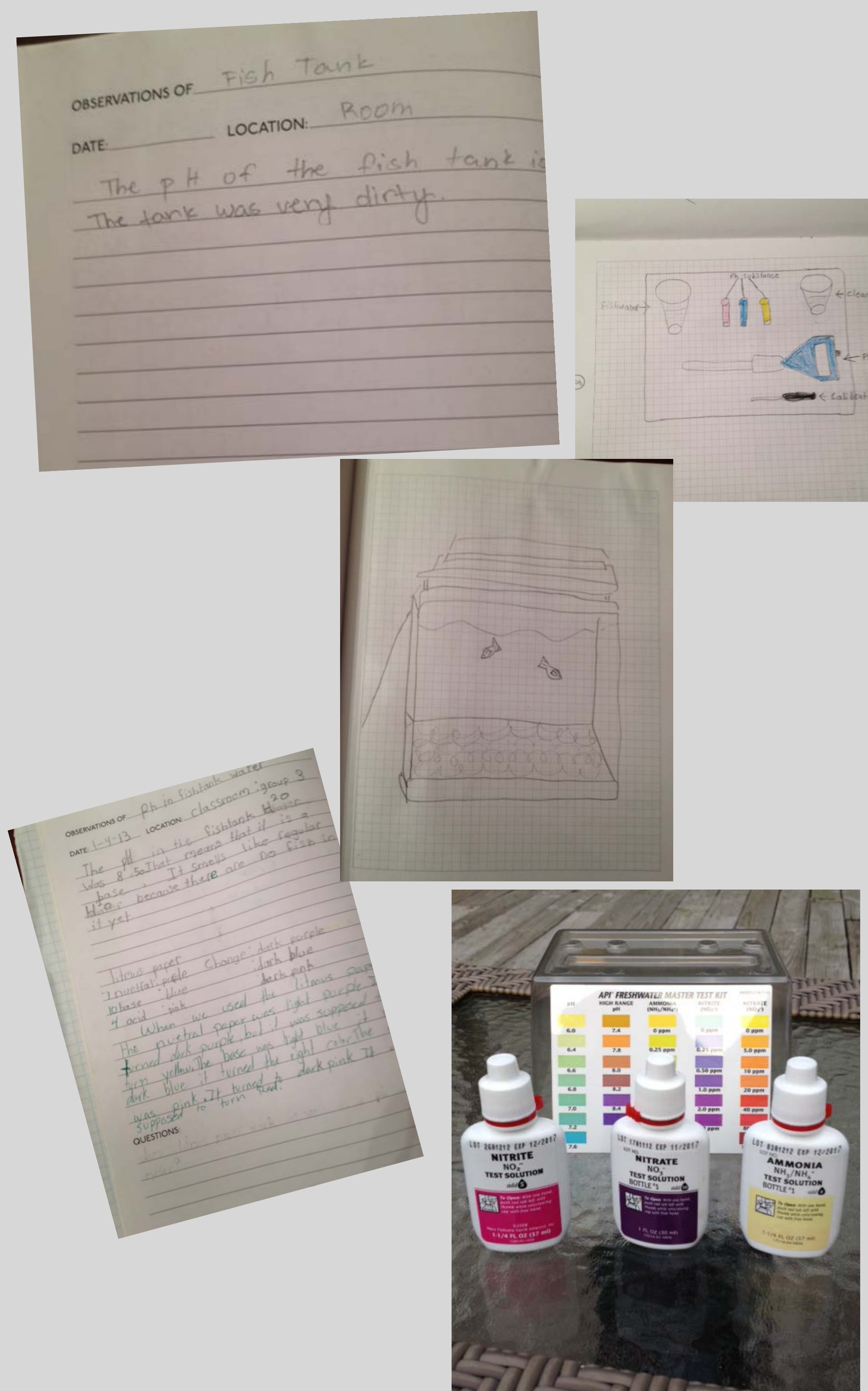
## Lesson Structure

A component from the book Making Content Comprehensible for English Learners THE SIOP MODEL by Jana Echevarria, Mary Ellen Vogt and Deborah J. Short, includes the use of Content Objectives and Languages Objectives in every lesson. In this unit every lesson includes both, for example:

**Content Objective:** SWBAT demonstrate understanding of vocabulary terms through drawing their own illustrations and labeling correctly in their lab journals

**Language Objective:** SWBAT use vocabulary accurately in a complete sentence using proper conventions.

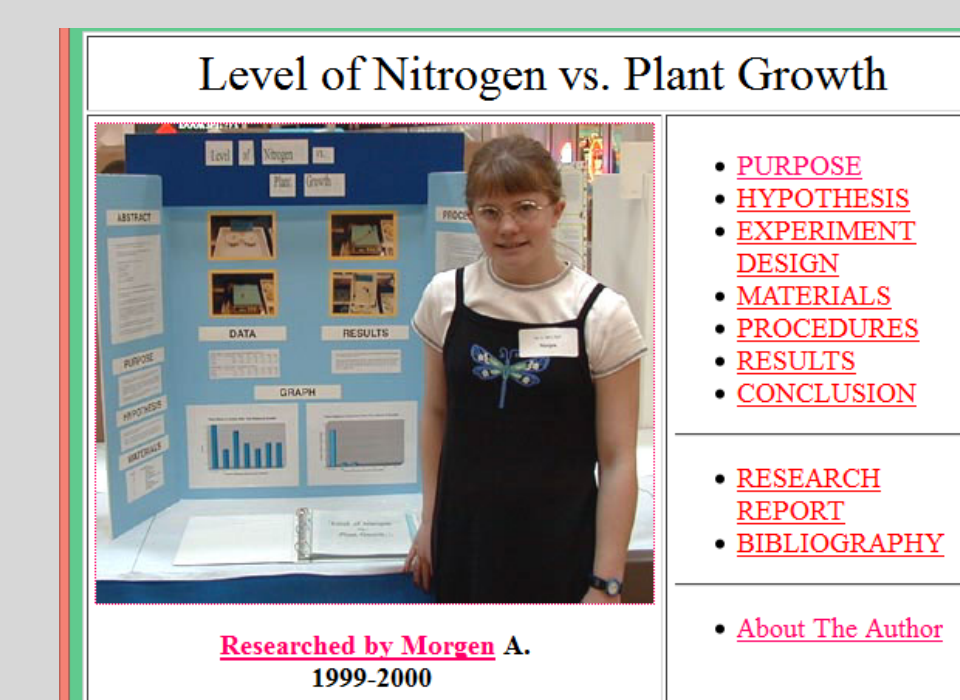
**Assessments:** Good teaching includes evaluation or assessment of student's knowledge. ESL students often have difficulty demonstrating their knowledge due to the language barrier. It is unfair to assess ESL students on writing ability alone especially in the early stages of their L2, second language development. The lessons in this unit include group work presentations, use of lab journals which allow for students to illustrate their work and label without having to write entire sentences or paragraphs, word banks, group presentations to encourage practicing the spoken language in a safe environment and on going lab work.



## "Safe " Learning Environment

Group projects are a perfect opportunity for ESL students to show their present level of English learning. There is usually a student that is more proficient with writing, one in speaking and another with reading. With prior teacher observation, group the students in heterogeneous grouping. Thus allowing ESL student a comfortable environment in which to practice skills. Large groups, especially with English speakers dominating the group, is often an intimidating atmosphere.

In this unit students will visit a website of a 5<sup>th</sup> grade student describing how she did a hands on research project.



Students will use Morgan's research project as a model in which they will develop their own project based on the Nitrogen cycle and classroom fish tank.

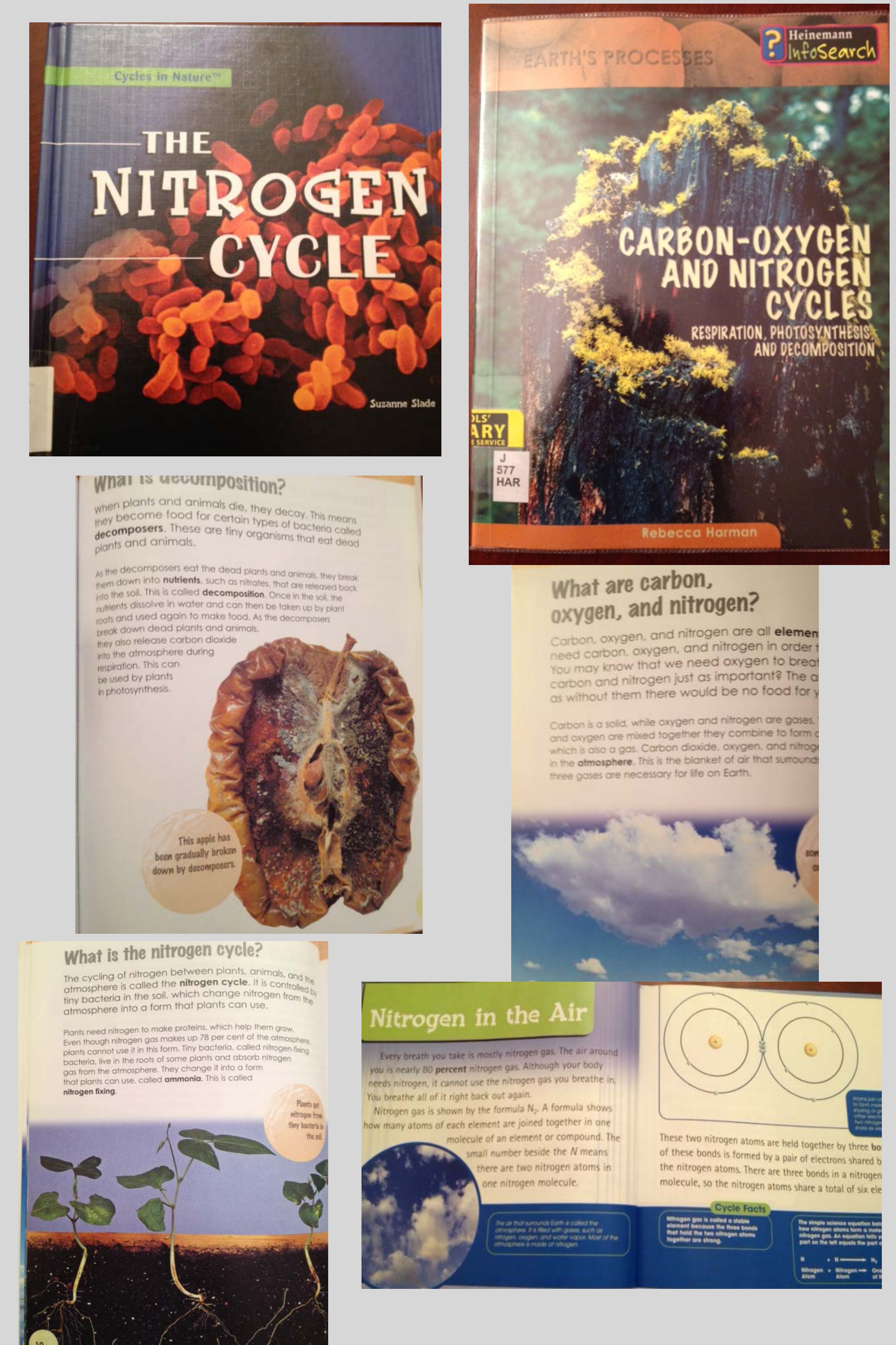
A bit of felicity...growing lily pads. Lily pads are a common sight around Western New York so why not see how they grow.



## Literature

Expository/non-fiction text is a challenge for the best reader, English speaker or ESL student. Choosing literature/ trade books for the ESL student should include content rich material displayed in a non overwhelming manner. This includes the actual font size and amount of text per page. A traditional text book's appearance can seem too difficult due to the denseness of the amount of print.

The trade books chosen for this unit include descriptive illustrations, larger font size and rich content in a less complex form.



## References / Acknowledgements

Echevarria, Jana, MaryEllen Vogt, and Deborah Short. *Making content comprehensible for English learners: the SIOP model*. 2nd ed. Boston: Allyn and Bacon, 2004.

Science Project 2000 Index – Selah researched by Morgen A. 1999-2000 www.selah.k12.wa.us/SOAR/SciProj2000/index.html

Thanks Dr. Joe Gardella for his continued support and devotion to the children of the Buffalo Public School children and teachers