Climate Change Lesson Plan for 3rd Grade: Snorkeling and Underwater With Jacques Cousteau

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Grade Level: Elementary, 3rd Grade

Summary
This lesson is designed for third grade ESL students as part of a leveled reading group activity. It can be done as a small group of four students meeting daily Monday through Thursday for 30 minutes. This reading group that this lesson is based on is part of the Washoe County School District's (WCSD) mandatory 90-minute elementary reading block. This lesson plan is designed for the fifth day of a five-day unit. It includes Nevada State Language Arts and Science, as well as the WCSD ESL standards. The Sheltered Instruction Observational Protocol (SIOP) model for lesson planning was utilized which helps in meeting all objectives as well as assisting in taking into consideration each student's speaking, reading and writing abilities.

Making use of the leveled readers that accompany the reading program mandated by the District gives students a richer reading experience by pairing other books, particularly nonfiction with a more advanced reading level. This allows students more text-to-self and text-to-text connections which in turn gives students more opportunities to express themselves through discussion and writing. This also gives a richer experience so they will become accustomed to nonfiction text which comprises a large part of the Reading Criterion Reference Tests.

Goals in This Lesson

- Allow each student to participate in the experiments
- Students record their predictions and what actually happened
- Students record their observations at each stage of the experiment
- Extend the lessons for writing and reading activities

Summary of Procedures
To begin the lesson, reread the last chapter of Jacques Cousteau. Discuss what pollution is and why Jacques Cousteau was worried about what was happening to our oceans. Introduce the experiments with water that are to be done as a follow up to the reading. Explain that the students will examine what happens to water when put in detergent, bread, toilet paper, sunscreen, paper, and coins. Students write their predictions and then make observations of what actually happened in their ocean journals.

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Have students write and discuss their observations. Further have them document what happened to the water one week later and finally two weeks later.

The students will make many discoveries, some common sense and some that will surprise them especially that the detergent does not make a lot of bubbles. The bread floats and continues to float for over a week. They will see that the toilet paper never did disintegrate over two weeks of observing. They discover that the paper, as well as the coins went to the bottom of the bowl and never floated. They discover that the sunscreen when squirted in a continuous ribbon, sinks quickly to the bottom and then slowly over the next two weeks broke up in white globs and turned the water white. The water bowl in which the sunscreen was in never did acquire the scent of the sunscreen.

Science Lessons Incorporating the Science Inquiry Cycle

A. Concepts addressed by the lessons:

- How humans contribute to pollution of our oceans and ocean climate change.
- What happens to things we put in our water.
- What we can do to protect our water.

B. Nevada Science Standards:

Nature of Science

- N.5.A.1 – Students know scientific progress made by conducting careful investigations, recording data, and communicating the results in a scientific manner.
- N.5.B.3 – Students know the benefits of working with a team and sharing findings.

Life Science

- L.5.C.3 – Students know changes to an environment can be beneficial or detrimental to different organisms.
- L.5.C.4 – Students know all organisms, including humans, can cause changes in their environments.

Earth Science

- E.5.A.3 – Students know most of the Earth's surface is covered with fresh or salt water.

C. Basic Procedures:

This lesson is for Day 5 of a five-day lesson. It builds upon the reading and work of the previous four days. On Day 1, students are told that they will become

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oceanologists. Using a KWL chart, students are asked what they know about the ocean. Vocabulary is introduced for the story, Snorkeling using a Content Cognitive Dictionary. The students read the story first together as a group, then with partners for fluency. On Day 2, vocabulary is introduced for the story, Underwater with Jacques Cousteau. As this is a more advanced story, read the story to them and then stop to discuss meaning and review vocabulary. On Day 3, review vocabulary and reread Underwater with Jacques Cousteau and review Snorkeling. Discuss coral reefs and the diverse animal and plant life they are home to. On Day 4, students will examine the difference between fresh and salt water with water samples and record their comments. Include daily discussions on what is happening to our oceans and the ways people can help the oceans and continue to review the vocabulary and review the two books. On Day 5, the science experiments are conducted. Examine what happens to water when detergent is put in. Then continue experimenting in the same way with bread, toilet paper, sunscreen, paper, and coins. Students are to write what they think will happen and then what actually happens in their ocean journals. They will describe their observations in detail in their journals as well. They should document what happens to the water one week later and finally two weeks later.

Start off the experiment by adding detergent to a bowl of water after asking the students to write what they think would happen. Explain to them that this will be the pattern with the subsequent investigations.

On the day of the experiments, the students record their predictions and their observations on a sheet of paper with these headings:

What will happen when?	What do think will happen?	What actually happened?
Detergent is added to the water?		
Bread is put in the water?		
Toilet paper is placed in the water?		
Sunscreen is squirted		

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into the water?

Coins are thrown
into the water?

1. Questioning and Theorizing
   Before each experiment, explain the activity and procedure. Have students write their predictions on their sheets.
2. Forming Hypotheses
   Students record their predictions as to what would happen before each experiment. They also predict what they thought they would see the next day and then one week later.
3. Investigating Our Hypotheses
   Students record their observations and we discuss them.
4. Analyzing Our Data
   The bowls with the items inside are kept and observed for over two weeks after conducting the experiments.
5. Synthesizing
   The students collect data and formulate the reasons as to what is happening to the water.
6. Extending Our Theories
   Discuss what would happen to the water if:
   - All the items were mixed together?
   - If everyone dumped things into our waterways?
   - What would happen to the animals and plants that live in water?

Integration of Climate Change Standards into the Science Lesson
During the course of the lesson discuss how people contribute to the pollution of our water. The students write about why they want clean water and what happens to water, once polluted. Discuss why and how pollution is changing our water and most importantly, our environment.

Your students possibly have never participated in this type of lesson before so it may be a learning experience for them. Although challenged by English proficiency, most will fully participate and gain the core knowledge described by the science standards. This lesson opens their eyes to a new world where even though they are third graders, they could be scientists. They learn that they can work together like scientists to predict, observe, discuss, record information and draw conclusions based on their findings.

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Pertaining to climate change, the most important knowledge that gained from this lesson is from the Life Science standards:

- Students know changes to an environment can be beneficial or detrimental to different organisms. (L.5.C.3) and
- Students know all organisms, including humans, can cause changes in their environments. (L.5.C.4)

Differentiated Instruction

In most classes, there is a wide range of speaking, reading and writing abilities. Falling back on the standard sheltered instruction methodology so that any Non-English Proficient (NEP) or Limited English Proficient (LEP) students have the support they require. Students are allowed appropriate activities according their language proficiency levels. Yes or no answers are allowed for my Non-English proficient students. For LEP students, they use their best spelling and many times, it is hard to understand. For example before the experiment, the students first write their predictions as to what would happen to the items in the water. Then each student had an opportunity to say what he or she had written. Validate each response and then do the experiment to see what actually happened, have a discussion and then they can write it down.

Effective Use of Assessment Strategies

A. Planning for this lesson may differ from previous methods with incorporated science standards. You need to anticipate what students will do and how they will act.

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B. Be aware of students' predictions and their writing. Through the use of informal assessments on their predictions and their writing, assess if you are accomplishing your objectives in this lesson. As many students are English language learners, they are developing their writing skills. This is really true for all students in third grade.

C. Use formative assessment to ensure that students are actively involved during the lesson. Ensured that the students are on-task. Keep in mind that the students will be excited during the lesson which equates to learning. They typically cannot wait for their turn to do an experiment.

Additional Information for the Lesson

A. If this is the first lesson plan you prepare that incorporates science experiments, be ready for pleasant surprises. Students actively participate in, conduct and observe, and quickly learn to take charge of the scientific process. This lesson will take more preparation time, especially if you are not familiar with inquiry-based science teaching. Incorporate the Nevada Science Standards and you may discover that students have little experience in participating in science experiments. This is a good thing to change!

B. The students will be excited with this hands-on lesson plan. They will have a hard time waiting for their turn to do their experiment. They thoroughly enjoy the lesson and being active participants in the experiments.

C. The students will be highly motivated and focused on what was going on since this is hands-on and each student is able to do one or more of the experiments.

D. The students may be very animated, focused on the experiments so be prepared for a lot of activity in the classroom. Keep an eye on them, but as much as possible let them be in charge of their own learning.

Author's Comments

I enjoyed this lesson and learned a lot from it. I discovered that unexpected things occur. I was surprised at the results of my own hypotheses. I was sure that the toilet paper in the water would eventually disintegrate, but it did not. I thought that the sunscreen would float and it stayed on the bottom of the bowl and slowly disintegrated, turning the water white. I also thought the paper would float, not sink to the bottom of the bowl.

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Please share your comments about successes with this method with Kay Wilkinson-Brown, Westergard Elementary School, 1785 Ambassador Dr., Reno, Nevada 89523, 775-746-5800 or by e-mail: Kay Brown <KWBrown@washoeschools.net>

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