Pollution and How it Affects Aquatic Life

Intro

During our placements at Moylan Elementary School, we noticed a lack of emphasis on science-based learning in the curriculum. Science is important to introduce and teach to young students at the elementary school level because it provokes children’s interest in the subject. Science is also a great way for teachers to engage their students in the material thru the use of hands-on approaches such as experiments and demonstrations. In learning about science, students are able to gain a basic understanding of how the environment and the natural systems within it work around them. Our curriculum project idea stems from the notion that young students should have an awareness and knowledge of how their individual actions can lead to a positive or negative impact their environment. Thus, we designed a project about pollution and how it affects aquatic life for third grade students.

Context

Our thematic unit on pollution and aquatic life will be taught over the course of five consecutive school days in a third grade classroom. We chose the study of pollution and marine life in order to keep this young age group of students as engaged and excited about the unit material as possible. The curriculum incorporates a variety of subjects in learning such as science, geography, reading comprehension, and art. It also activates and allows students to develop general academic skills regarding internet research, group work and oral presentations. Finally, due to the variety of content and activities available, pollution and how it affects aquatic
life is an appropriate topic for implementing a multidisciplinary lesson plan at the third grade level.

**Objectives:**

1. **Students will be able to identify and label the 4 oceans, and will know how much of the earth’s surface consists of water.**

   This objective targets the start of the curriculum. Students are not expected to have a very extended knowledge of the oceans or the geography of the earth. The purpose of this is to get them familiar with the idea of aquatic life, and eventually pollution in their own lives, using the basic knowledge of where the 4 main bodies of water on earth are located on a map. It is important for the students to understand location so they can gain an interest in the oceans that are close to them. This objective is also critical to starting out the unit because the main goal of this lesson is to raise an awareness of the global problem of water pollution in these students’ lives, the large amount of water that the earth is made up of will spark an interest in the students and hopefully push them to want to learn more.

2. **Students will learn basic internet research skills through gathering information on how their assigned aquatic animal is affected by pollution.**

   This objective is used to develop a basic life skill of internet research. Keeping in mind that these are only 3rd grade students, the research will be conducted with guidance. We believe it will be easy to teach the internet research skills if they are guided with helpful questions to choose from and have a provided website to search. This also will teach a start of basic typing skills. Researching skills are very important because it is a basic skill that will be necessary throughout schooling. Along with the skill gaining advantages, when considering this project, it is a helpful way for the children to learn about aquatic life on their own instead of being told by
the teacher or having to read it off of a sheet of paper. Keeping these young students engaged in an activity like this is much easier when they are given the freedom and responsibility of doing something on their own.

*CSCF.Science.3.B INQ. 8: “Search the Web and locate relevant science information.”

3. **Students will teach their classmates in a small group about the affects of pollution on their specific aquatic animal through the jigsaw method of cooperative learning.**

   This objective highlights one of the main learning techniques used in this curriculum: Robert Slavin’s Cooperative Learning Technique of the Jigsaw method. Later we will go into more detail about how the entire method works, but overall, the main goal of the Jigsaw method is to allow students to teach their peers about the material they are studying rather than their teachers. This is important because on more than a few occasions, we have witnessed first hand in our placements that when a child has to reiterate, teach, and project something they have studied, it helps them remember and better understand the particular information. This information is then engraved in their mind. Learning about one specific animal keeps the content simple and the students will feel a special connection to their animal by becoming pros about their particular animal. In addition, the aquatic animals the students get to choose from are ones that are popular and present in their lives.

*CSCP.Science.CMT.3.B11: “Describe how natural phenomena and some human activities may cause changes to habitats.”

4. **Students will demonstrate concern for the environment by recommending ways to conserve the ocean.**

   This objective targets the student’s ability to demonstrate their knowledge of the final concepts of the unit. This objective demonstrates the students’ ability to articulate their concern for the
environment. Students will use knowledge of pollution to efficiently help their community to become more aware of the global issue and how to create progress in solving this problem.

*CSCF.Science.B.3. INQ. 5: “Use data to construct reasonable explanations.”

Activities

On the first day, the students will be introduced to the ocean by showing a national geographic video that emphasizes how much of the earth is made up of water in class. The video also consists of information about the geography of the oceans such as the location of the oceans in relation to each other and the type of animals that generally live in certain bodies of water. An interactive activity will be introduced after the showing of this video. Each child will be split into even groups of about 5 and receive a map of the earth the size of a standard sheet of printer paper. They will be asked to fill in the area of water in one color skittle (preferably purple or blue) and the area of land in another color skittle (preferably green or orange). Once that is done, each student will be asked to separate the candies and group them into their individual colors. By having a visual example of how much more water the earth is made up of than land, the students will understand the drastic difference in size preparing their understanding of how important the ocean and aquatic life is to the earth’s environment. This is important for igniting the young students’ interest in the subject because it can often be difficult to keep them engaged in curriculum material if it is not interesting or does not apply to them. When they find the topic engaging and exciting they are more inclined to put in more effort and have positive attitudes.

For homework, the student will take home a blank map and be asked to label the 4 oceans according to location. This homework is a good way to practice the unit outside of the classroom. Ultimately, the students will take what they have learned and extend it outside of the classroom. In addition to introducing the various oceans and completing the ocean geography activity, the
teacher will also get the students excited for the unit by introducing the final project assignment. The teacher will briefly discuss what the assignment is in order to allow the students to begin thinking about their posters.

On the second day of the lesson plan, the students will be taken on a field trip to the Mystic Aquarium. The students will get a tour of the entire aquarium and they will be able to see various exhibits demonstrating pollution while seeing different aquatic animals up-close. This unique experience of visiting the aquarium will provide students with real life and concrete examples of what they are studying. Mystic Aquarium strives to teach their visitors how to care for and protect the ocean planet with the use of demonstrations and exhibits throughout the aquarium. Along with partaking in the field trip, the students will also be required to fill out a “KWL” chart. A “KWL” chart has three sections entitled: what I know, what I want to know, and what I learned. However, we are going to add another section to the traditional “KWL” chart entitled: questions I still have. This section of the remaining questions the students still have after their visit will help to guide their research for their final project. The students will be asked to fill out this chart before and after the field trip to ensure that they are keeping the unit in mind as they enjoy a fun-filled day at the aquarium. As a result of this trip, the students will be provided with a unique knowledge and understanding of the topic of pollution and how it affects aquatic life from their visit at Mystic.

On the third day, the students will be given a variety of animals to choose from to do their project on. Each student will be given a selection of four animals to choose from. These animals include a fish, bird, seal and sea turtle. The creatures will be selected in a first come first serve process, with a repeat of some animals in order to keep the curriculum simple and understandable. Once each student has been assigned their animal, they will be asked to conduct
internet research to learn more about their specific animal. They students will only have access to
two internet search engines: National Geographic for kids and Kidrex. The task of internet
research is important because it incorporates reading comprehension and note taking. In order to
guide and structure their research, the students will use a provided handout with a series of
questions to lead them in the appropriate direction rather than given them complete freedom in
the research process given they are at a young age. As part of the project assignment, the
students will be asked for 3 important facts about their animal that they will find through their
internet research. As another requirement of the project, the students will also be asked for 3
facts about pollution and how it relates to their certain animal. These facts can come from their
research online using the set of guiding questions or from their observations at the museum. The
students will use their research and use it for their final project of the poster.

On the fourth day, the students will be quizzed on their knowledge of the 4 oceans. This
quiz will test the student’s knowledge and ability to retain the presented and discussed
information from the first day of the unit. As their schooling goes on in the future, these students
will be taking tests and quizzes to evaluate their knowledge of various subjects. A lot of
curriculum in schools today is extremely testing heavy and in order to prepare them for that, a
small quiz is a good place to start. It can be said that testing young children is too high stress for
such a young age, however, we believe that in order to access the student's knowledge of the
ocean geography a small quiz is necessary. After taking the quiz and reviewing the correct
answers, the students will design and make their posters. They will have to learn how to present
their animal and the issue of pollution in an interesting and creative way via their poster. The
entire day is devoted to these posters to ensure that there is enough time for creativity and effort.
On the last and final day of this curriculum content, the students will present their posters. Using Robert Slavin’s cooperative learning technique of the Jigsaw method, the students will be broken up into small groups of 4-5 students who share their same aquatic animal--researched the same animal. Every group will discuss their ideas and information they gathered on their common animal by presenting their individual posters. Each student will then be divided into a second group where one by one they will present their project to other students who have different kinds of animals and educate their peers about their particular animal using their posters as a visual aid. This learning method maintains the idea of individual accountability meaning that each student is responsible for their learning by forcing them to become experts on particular aspects of the subject material--such as their specific animal. Since each group is random, it ensures that all students are achieving and given equal opportunities-- this is considered to be the equal opportunity for success. After each presentation, the goal and hope for this exercise is to ensure that each student develops compassion and a full understanding of their animal, along with the concern of how pollution affects their environment. To conclude the unit, the students will be asked to choose one poster from each group (for each animal) that best reflects aquatic animals and how they are impacted by pollution to hang up around the school in order to raise an awareness amongst their peers of the issue of pollution and spread their newfound knowledge after completing this unit.

Evaluation

For the evaluation, the students will mainly be graded on their final poster project. The teachers will be given a rubric when the project is first assigned on Day 3 that includes all of the requirements and expectations of the assignment. First, the students will be evaluated on effort. This is graded by the teacher's discretion on the fourth day when they are given the entire class
period to do their projects. The word “effort” is presented to the students as clear work and progress being done throughout the entire class period. As long as the teacher can see that they have worked to the best of their ability on the project, they will receive a 4 on this portion of the unit. The most important thing about this section is that the student has given the 3 facts about their animal and 3 facts about pollution. In the next part of the rubric, students will be evaluated on the creativeness of the project. The word “creative” can be hard for some students to understand. They may think to themselves that they aren’t artistic and will automatically lose points on this section. Creativity does not mean that they are being graded on their artistic ability. Creativity is the ability of the students to use the resources given to them and create something that reflects their understanding and knowledge of the unit. It can be as simple as how the students choose to organize their poster to illustrate their knowledge. The artistic aspect of this project is also used as a fun and stress relieving part of the assignment because it allows the children to do what they feel is pleasing to them. Overall, the project will be evaluated on a 1-5 scale: (4-5)- demonstrates clear understanding of subject, able to apply information successfully and creatively, exemplary effort. (2-3)- exhibits a substantial understanding of information, some effort and creativity shown. (1)- shows minimal understanding of information, gives insignificant amount of creativity and effort. These previous descriptions of creativeness and effort are given to the students so they know exactly what they need to do and what exactly these expectations mean.
Appendix:

Mystic Aquarium

Poster Example

Pollution and Turtles

Facts about Sea Turtles:
- They lay their eggs in holes on the beach
- Temperature of sand determines the gender of the baby
- They can live up to 80 years old

Facts about Pollution:
- Is the contamination of bodies of water
- 14 billion pounds of plastic trash is dumped into the ocean every year
- Water pollution is the main cause of various diseases
### KWL Chart

<table>
<thead>
<tr>
<th>What I know</th>
<th>What I want to know</th>
<th>What I learned</th>
<th>Questions I still have</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</table>

### Map Quiz

![World Map](https://www.enchantedlearning.com/world/)

- **NORTH AMERICA**
- **SOUTH AMERICA**
- **EUROPE**
- **ASIA**
- **AFRICA**
- **OCEANIA**
- **ANTARCTICA**

- **Northern Hemisphere**: 
  - **Equator**: 
  - **W**: 
  - **E**: 
  - **N**: 
  - **S**:

- **Southern Hemisphere**: 
  - **Equator**: 
  - **W**: 
  - **E**: 
  - **N**: 
  - **S**:

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Guiding Research Questions:

Researching Your Animal

Animal: _______________________

Fun and Interesting Facts about your animal:

1. Where does your animal live in ocean?
2. What does your animal eat?
3. How does your animal travel around in the ocean?
4. What are some characteristics or traits about your animal?
5. What makes your animal different from the others (what it looks like)?

How your specific animal is affected by pollution:

1. What types of pollution affect your animal?
2. Is marine debris a big factor in impacting your animal’s habitat?
3. How does pollution harm your animal?
   a. Can you give specific examples such as types of marine debris like plastic or aluminum?
Work Cited:


