Hydrosphere – Lesson Planning for Oceans, Life, and NJCCC Standards

The purpose of this unit is for the students to learn about different aspects of the oceans. The Atlantic Ocean is very close to where we live, so the students can use what they learn to better understand it when they go to visit the beach. The skills that they will be using throughout the lesson are important because they will be using those skills during the rest of their education and maybe during their life in their careers. This unit will take 2 weeks to implement. The first week consists of learning new information through teacher taught lessons, activities and student made projects. The second week consists of presentations, reviewing for clarification, a test, and a class trip to Sandy Hook. After this unit, students should have learned about oceanographers, the difference of heat capacity of water and air, how waves work in the ocean, the parts of the ocean floor, and what kinds of marine animals live in different parts of the ocean. The students will give an oral presentation, hypothesize and conduct an experiment, use the information they gathered to create a line graph, use the internet and read handouts, make a model, and create a coloring book.

There are 20 students in this class. The students range from ages 11-12 years old. It is a sixth grade class. Two students have ADHD. One student has cerebral palsy, and is in a wheelchair. That student is at a high functioning level. This student uses a laptop because they can't write. Four students wear eye glasses. There is one classroom aid and a personal aid for the student with cerebral palsy.

One learning center that would be used during this unit would be a book table. The students can go there to read books to learn more about oceans. Another center is the computer center. The students would use this center to research their oceanographer and other information they would like to learn about the ocean. A list of useful websites will be at this center to help students choose reliable sites. Another center will have magazines and newspapers that have articles related to the ocean. This current events table enables the students to be updated on things happening around the world. The students can choose from writing a summary or poem, drawing a picture, or their own creative idea to explain the article. Another center is the creative area. Students can use a variety of materials to assemble a model, picture, or diagram, etc. that resembles what they are learning about. The last center is the peer tutor center. Students can go to this center to help and/or get help from a classmate.

Resources:

Books:

Sea Legs Tales of a Woman Oceanographer by Kathleen Crane

The Atlantic Ocean by Leighton Taylor

Waves and Tides by Patricia Armentrout

Oceans by Trevor Day

The Random House Atlas of the Oceans by Jacques Cousteau

The Magic School Bus On The Ocean Floor by Joanna Cole

Magazines:

National History Magazine

Internet websites:

http://www.womanoceanographers.org/

http://www.mbgnet/salt/sandy/indexfr.htm

http://www.infoplease.com/ce6/world/A0805214.html

http://www.ocean.com/index.asp?LocationID=5&CatId=5

http://www.ocean.com/index-news.asp?LocationID=27&CatId=27

http://www.ocean.com/index.asp?LocationID=44&CatId=44

http://www.enchantedlearning.com/coloring/oceanlife.shtml

Other:

We will take a class trip to Sandy hook and be given a tour to learn about Sandy Hook.

New Jersey Core Curriculum Content Standards

Standard 5.8 Earth Science

All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.

5.8.6 B. Atmosphere and Water

1. Describe the composition, circulation, and distribution of the world's oceans, estuaries, and marine environments.

Learning Goal

Students will research, write, and do hands-on activities to describe and understand the composition of the world's oceans.

Title: Oceanographers are Important People

Grade: 6

Objective:

The students will be able to prepare an oral presentation about an oceanographer.

New Jersey Core Curriculum Content Standards:

Standard 5.8 Earth Science

All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.

5.8.6 B. Atmosphere and Water

1. Describe the composition, circulation, and distribution of the world's oceans, estuaries, and marine environments.

Materials:

KWL Chart on black board

Chalk

Computers with internet access

Resources on oceanographers:

Sea Legs Tales of a Woman Oceanographer by Kathleen Crane

National History Magazine

http://kids.earth.nasa.gov/archive/career/oceanographer.html

http://nmnwse.org/careers/HTML/C22OCEAN.HTM

http://www.womanoceanographers.org/

http://www.tsha.utexas.edu/handbook/online/articles/EE/few3.html

http://www.cnn.com/WORLD/9706/25/cousteau.obit/index.html

(and other print and non print resources)

Set Induction:

1. The teacher asks the students what they know about oceanographers and record what they say on the “K” portion of the KWL chart.

2. The teacher asks the students what they want to know about oceanographers and record their responses in the "W" portion if the KWL chart.

Teaching Procedures:

Direct Instruction:

1. The teacher passes out the "Oceanographer/Marine Biologist" handout.
2. The students get a few minutes to read it silently.
3. Then a few students are called on by the teacher to read a paragraph out loud.

Guided Practice:

1. The teacher will hand out the "What is an oceanographer" packet.
2. The teacher will break the class up into small groups of 3-4 students.
3. The students will have about 10 minutes to read the packet out loud with the group. Students will take turns reading within the group.
4. The teacher and paraprofessionals will be circulating the room to answer any questions students may have.
5. The students will discuss within the group if they would like to be an oceanographer, or what they like about what they do.

Independent Practice:

1. Students will be given an outline for an oral presentation on an oceanographer.
2. Students will research famous oceanographers via books, the internet, and other resources.
3. They will have time to gather information and start filling in the outline for their oral presentation.

Summary:

Students will discuss what they learned from their research and from the information they read with the class.

Evaluation:

The students will be assessed on their oral presentation that is due in one week. A rubric will be used to grade the presentation. Observations will also be made by the teacher during class discussion to assess understanding.

Follow-up:

The students should continue to work on their outline for their presentation. This oral presentation is due in one week. A visual aid for the presentation should be made at home along with the rest of the outline

Role of the Paraprofessionals:

They will help students understand words they are reading in the packet. They will help students stay on task and research information in books, magazines, and on the internet.

Title: Heat Capacity of Water

Grade: 6

Objective:

The students will be able to produce a line graph that compares the heat capacity of air and water and compare their findings with a group.

New Jersey Core Curriculum Content Standards:

Standard 5.8 Earth Science

All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.

5.8.6 B. Atmosphere and Water

1. Describe the composition, circulation, and distribution of the world's oceans, estuaries, and marine environments.

Materials:

For each group:

2 thermometers

Water in a bucket

A light that can stand over the bucket

Stopwatch/clock

Data collection sheet

Graph paper

Pencils

Overhead projector

Set Induction:

1. The teacher asks the students what they think heat capacity means.
2. The teacher writes their ideas on the overhead projector.

Teaching Procedures:

Direct Instruction:

1. The teacher writes its definition on the overhead projector for the students to write in their notes.

2. The teacher tells the class they will be performing a mini lab to test the heat capacity of water vs. air.
3. The teacher will show the steps of the lab so the students know what they will be doing.
4. Students can ask questions if they need clarification.

Guided Practice:

1. The teacher splits the class into groups of 4-5 students.
2. Each group will divide the jobs: recorder, timer, material gatherer, data collector, and material returner.
3. The material gatherer gets what they need and each group sets up their lab. With one thermometer in the water and one in the air.
4. The data collector tells the recorder the temperature of the air and water before the light is turned on.
5. After every minute the temperature of the air and water is recorded for 10 minutes.
6. Then the light is turned off, and the temperature of the air and water is recorded for 10 minutes.
7. Each member of the group will copy the data on their own data collection sheets.
8. Then the group will clean up their lab area.

Independent Practice:

1. The students return to their own seats and produce a line graph using the data they just collected.
2. The students then write a paragraph describing what their line graph shows about the heat capacity of water and air.

Summary:

Each group will discuss their findings with the class. Students will share their line graphs and what they learned from the activity about heat capacity of water vs. air. Major points will be reviewed.

Evaluation:

Students will be evaluated on their line graph, teacher observation of participation of lab and in group discussion, and journal entry.

Follow Up:

For homework students need to write what they did and learned in class today and explain why it is important to them.

Role of the Paraprofessionals:

They will help students understand directions, stay on task, make sure they are taking notes, and guide them in creating their line graph.

Title: Waves

Grade: 6

Objective:

The students will be able to create five questions and answers about waves that will be used in a review game

New Jersey Core Curriculum Content Standards:

Standard 5.8 Earth Science

All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.
5.8.6 B. Atmosphere and Water

1. Describe the composition, circulation, and distribution of the world's oceans, estuaries, and marine environments.

Materials:

Computers with internet access

http://www.mbgnet/salt/sandy/indexfr.htm

Waves handouts

Ropes

Paper

Pencils

Books on oceans:

The Atlantic Ocean by Leighton Taylor

Waves and Tides by Patricia Armentrout

Oceans by Trevor Day

The Random House Atlas of the Oceans by Jacques Cousteau

Set Induction:

1. The teacher will enter the room with a wet suit on and will be carrying a surf board.
2. The students will most likely ask him/her why they have that on.
3. The teacher would ask the students why people wear them, and who wears them.

4. Students' responses will probably be related to surfing. This will lead into a discussion about the surfers riding waves.
5. Then the teacher will ask the students what kind of waves do surfers ride, and if they know how they form, which will lead right into the lesson.

Teaching Procedures:

Direct Instruction:

1. The teacher will instruct the students to access the website: http://www.mbgnet.net/salt/sandy/indexfr.htm and click on "waves". The directions will be written on the board as well as told to the students.
2. Students will be called on to read the paragraphs on the website out loud.
3. The teacher will add examples and explanations throughout the lesson.
4. The teacher will also ask questions to make sure students understand the information.
5. Students should be taking notes on the information. The students will learn about the parts of a wave (crest, trough, wavelength, period, frequency, orbital movement).

Guided Practice:

1. Students will work in pairs to make waves using the rope.
2. The students will take turns making the waves.
3. Together with their partner, the students will talk about the parts of the wave and what is causing them.
4. The students will create their own diagram of a wave and label its parts.
5. The teacher will walk around the room to listen to students' conversations and answer any questions they may have.

Independent Practice:

1. On their own, the students will create a five questions and answers that will be used during the jeopardy review game.
2. Each student will write in their journal about what the liked most about today's lesson, and what did they learn.

Summary:

The students will share the work they did in pairs and small groups. They can also share what they enjoyed about the lesson.

Evaluation:

The teacher will assess the students when she/he is walking around during guided practice and listening to the students' conversations. The diagrams of the parts of the waves will be graded along with the 5 questions and answers for the jeopardy review game.

Follow Up:

For homework, the students will write a short story about what they would experience if they were surfing in the ocean. Key terms they learned about should be used correctly in their story.

Role of the Paraprofessionals:

They will help students that have difficulty with the computer, make sure students are on task while working in pairs, and answer any questions students may have.

Title: The Ocean Floor

Grade: 6

Objective:

The students will be able to assemble a model and a graph of the ocean floor.

New Jersey Core Curriculum Content Standards:

Standard 5.8 Earth Science

All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.
5.8.6 B. Atmosphere and Water

1. Describe the composition, circulation, and distribution of the world's oceans, estuaries, and marine environments.

Materials:

Maps of the ocean floor

Ocean floor diagram

Shoe boxes with lids

Newspaper

Paper mache

Graph paper

Wooden dowels

Pencils

Rulers

Set Induction:

1. The teacher will ask the students why they think the Mid-Ocean Ridge formed.
2. The teacher will also ask the students what they think the ocean floor looks like.
3. The students' answers will be written on the board. This will get their minds moving and want to know what it really looks like.

Teaching Procedures:

Direct Instruction:

1. The teacher will show the ocean floor maps to the class and ask students what they think they see on the map. The teacher will focus mainly on the Atlantic Ocean because that is the closest to NJ, so it will be more authentic to the students.

2. The teacher will teach the parts of the ocean floor (continental slope, continental shelf, abyssal plain, canyon, Mid-ocean ridge, rift valley, seamount, guyot, and trench).

3. Students will take notes during lesson.

4. Students will be given a diagram of the ocean floor to fill in and use it to study.

Guided Practice:

Students will work in small groups of 3or 4. Together they will create a model of the ocean floor.

1. Students are instructed to draw a quick plan of an ocean floor as seen from the side: including the edge of the continent, a continental shelf, continental slope, and trench. They require their definitions to do this.

2. When the plan is checked by the teacher and they can properly identify each part, the group can start to make their model.

3. When the paper mache is dry (or close), the groups cut or punch out 8 holes spaced evenly apart across the center of the shoebox lid. The lid is then put on the shoebox to hide the ocean floor.

Independent Practice

1. The students take their graph paper and create a graph with the numbers one to eight (number of holes) along the bottom and about 1-25(measurement in cm) up the other side.

2. Once their graph is setup properly, each student will go to a different groups' ocean floor shoebox. Each student will put the wooden dowel in hole #1 until it hits the "bottom". They record the measurement on the graph with a simple dot. This continues for holes #2-8.

3. When all the holes have been measured, the students join their dots in order from one to eight using a ruler. When this is done, they should turn their graph upside down and label the parts of the ocean floor appropriately. Now they can look inside

the shoebox. They should see a representation of the floor that group created in the shoebox.

Summary:

The students will discuss with the class what they learned/what they enjoyed most about today's activity. Shoebox ocean floors and graphs will also be shared with the class. The teacher will probe for students to use key words that they learned.

Evaluation:

The teacher will observe how the students are working in groups. The shoebox ocean floor models and graphs will be used to show the students understanding. Class discussion at the end will also assess what the students have learned about the parts of the ocean floor.

Role of the Paraprofessionals:

They will make sure students are on task and taking notes. They can clarify any information students are still unsure of. They will also guide students that are confused how to make the model.

Title: Marine Animals

Grade: 6

Objective:

The students will be able to construct a coloring book with five (5) of each kind of marine animal: plankton, nekton, and benthos, and explain each one in a few short sentences.

New Jersey Core Curriculum Content Standards:

Standard 5.8 Earth Science

All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.
5.8.6 B. Atmosphere and Water

1. Describe the composition, circulation, and distribution of the world's oceans, estuaries, and marine environments.

Materials:

Marine animal pictures

Computers with internet access

Books on marine animals

Paper

Pencils

Trace paper

Set Induction:

1. The students will have a page of 3 pictures of marine animals; 1 plankton, 1 nekton, 1 benthos, on their desk when they enter the room.
2. They will have two minutes to think about where they may live, what kind of animal they are, what their name might be, etc.
3. Then they will pair with a partner and talk about what they thought.
4. Then everyone will share their thoughts as a class.

Teaching Procedures

Direct Instruction:

1. The teacher will explain there are 3 groups marine animals are classified into (plankton, nekton, benthos).
2. The teacher will give the definition of plankton animals.
3. The teacher will show examples of plankton animals, and where they live.
4. The teacher will give the definition of nekton animals.
5. The teacher will show examples of nekton animals, and where they live.
6. The teacher will give the definition of benthic animals.
7. The teacher will show examples of benthos animals, and where they live.
8. The students should be taking notes about marine animals.

Guided Practice:

1. Students will use the internet and books to research five (5) plankton, five (5) nekton, and five (5) benthos animals.
2. Students will write sentences about the animals.
3. The information should be reviewed by the teacher before a final draft is made.

Independent Practice:

1. Students will draw the marine animals they researched to create a coloring book for second graders.
2. Students will write a few sentences about each marine animal on the same page as their drawing.

Summary:

The teacher will ask students questions about different marine animals. Students will also share information they found about the marine animals they researched.

Evaluation:

The students will be assessed on the coloring books they create, and the sentences they write about each marine animal.

Follow Up:

They will continue to work on their coloring books for homework. They will be due in a few days.

Role of the Paraprofessionals:

They will help the students research marine animals in the books and on the internet. Some students may need help distinguishing the most important information about the animals. They also will make sure students are on task and listening to directions.

Accommodations:

For students with ADHD:

Setting Accommodations:

- ✓ Seating the student in the front of the room near the examiner or proctor

Scheduling Accommodations:

- ✓ Providing frequent breaks

Test Procedures accommodations/Modifications:

- ✓ *Administration accommodations/modifications:* Masking a portion of the test booklet and/or answer folder to eliminate visual distractions or providing reading windows

Other Considerations:

- ✓ Any medication has been appropriately adjusted so it will not interfere with the student's functioning

For student with cerebral palsy:

Setting Accommodations:

- ✓ Seating the student in the front of the room near the examiner or proctor
- ✓ Providing special furniture (e.g. desks, trays, carrels)

Test Procedures accommodations/Modifications:

- ✓ *Response accommodations/modifications: recording responses on a word processor (tools, e.g., spelling and grammar tools are not permitted)*

Other Considerations:

- ✓ Any medication has been appropriately adjusted so it will not interfere with the student's functioning
- ✓ Hearing aids, FM systems, Augmentative Communication devices, word processors, or other equipment are functioning properly.

For students with eye glasses:

Setting Accommodations:

- ✓ Seating the student in the front of the room near the examiner or proctor

Other Considerations:

Eyeglasses are used if needed.