



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
**Lesson Plans for Teachers**

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## **Math and Science in a Wetland**

### **Grade level:**

- 4th - 8th

### **Sample TEKS for 5th grade:**

#### Mathematics

- 5.5ab
- 5.13a-c
- 5.14a-d
- 5.16a

#### Science

- 5.1a
- 5.4a

### **Objectives:**

The students will be able to:

- Use scientific methods during field and lab investigations.
- Demonstrate safe practices during field and lab investigations.
- Collect specimens and make measurements with precision using the metric system.
- Describe biotic and abiotic factors in an estuary/wetland.
- Describe an estuary/wetland.
- Design a model of an estuary/wetland.
- Describe the value and function of an estuary/wetland.
- Use math skills of adding, subtracting, dividing, multiplying, using percentages, making charts and graphs, collecting field data and analyzing data, and designing a model.

### **Background:**

Students will have a working knowledge of the use of certain tools and equipment to be used in the field and lab before they go to the field.

### **Vocabulary:**

ecology  
estuary  
wetland  
abiotic  
biotic  
ecosystems

### **Materials:**

notebook  
graph paper  
colored pens/pencils  
meter stick  
tape ruler  
rulers  
seine  
binoculars  
field guide books (plants and animals)  
water quality kit  
relative abundance chart  
string  
stakes

### **Procedure:**

Day 1:

Have class describe their own vision of an estuary/wet land. Put ideas on overhead projector. Discuss all factors brought up by students. Describe all biotic and abiotic factors, including any values and/or functions that students may have discovered.

Students will write a summary of the estuary/wetland discussion. This paper will be turned in for a daily grade.

Day 2:

Students will go to library and do research on an estuary/wetland (including the use of the internet).

Students will prepare a rough draft of a formal paper on an estuary/wetland.

Day 3:

Go over plot sampling:

-describe quadrant.

-use string and stakes to build a one meter square quadrant.

-Show students the field guides (plants and animals). These will be used to identify plants and animals in the quadrant.

-Go over seining techniques:

-Show and demonstrate seining techniques.

-Have students practice seining techniques in the classroom.

-Students will identify all organisms in the seine.

-A count of all organisms will be done on site.

Introduce water quality kit:

Use aquarium water to demonstrate different aspects of water quality: pH, salinity, temperature, dissolved oxygen.

Introduce data chart to be used in collecting data (handout).

Have students practice water quality checks (break students into groups of 4-5 depending on class size).

Introduce field observation techniques:

-Students will observe area for any animals moving through the area of study (birds in

particular).

-Students will use binoculars and field guides to identify animals

-Students will keep track of all animals.

Day 4: in the field

-Students will work in groups of 4-5 and there will be four groups

-Group one will do plotting first.

-Group two will do seining,

-Group three will do water quality.

-Group four will do observations.

-Each group will go onto the next activity until all four stations have been completed.

-Students will count and try to identify all organisms in the plot and in the seine. Make sure the students take their time during these activities. Stress precision in their measurements and field technique.

-When finished, class will return to clean all the equipment.

Day 5: back in classroom

-Students go back to the groups they were in during the field activities and start compiling data on the proper forms.

-Groups will have separate sheets of the following forms: Species composition worksheet, relative abundance sheet, and water quality sheet.

-Each group will compute all data for their group or individual station.

-Each group will then obtain data from the rest of the groups for their stations.

-Each group will then combine data and compute the averages for each station.

-Students will then make bar graphs and pie charts of applicable data collected. Then students will turn in all papers for a major lab/test grade. This should include their field notes.

**Assessment:**

Students will write an essay describing the value and function of an estuary/wetland.

Students will turn in data and analysis.

**Enrichment:**

Have students get back in same groups from the field day and have them make a visual aid

(poster board) of the study area. They should include everything they encountered during the day

Have groups then make a presentation in front of the class using their visual aid.

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