

SALT MARSH SCIENCE INTEGRATED UNIT

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CONTENT/SUBJECT AREAS: Science, Math, Language Arts, Technology, Social Studies

Date: 4/29/99

Update: 2/20/19

Revised 2003

UNIT THEME: *Human Impact on Wetlands*

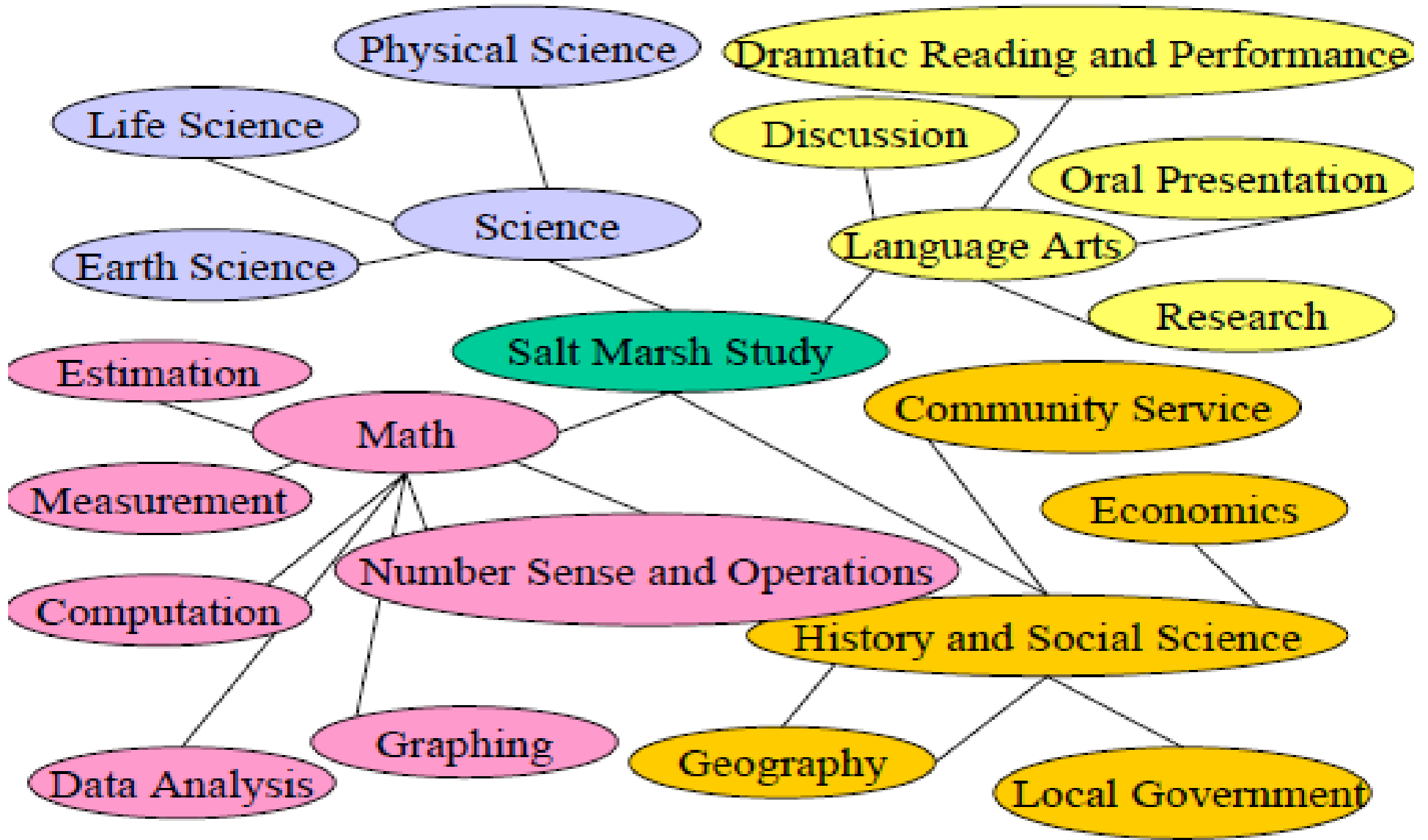
FOCUS CONCEPT FOR UNIT: *Interactions*

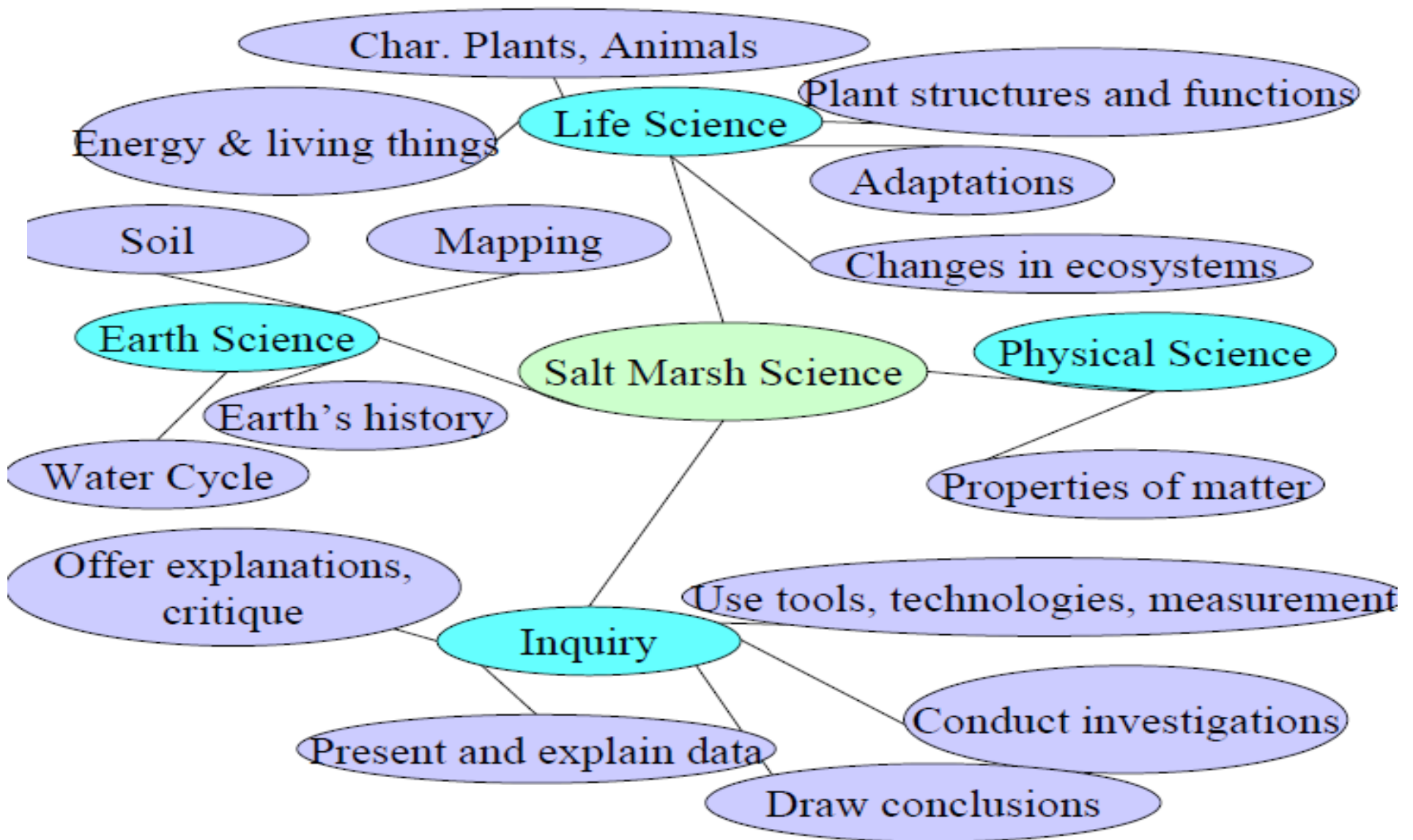
SUBCONCEPTS:

Coastal erosion	Conservation	Cycle (water & tide)	Deposition
Diversity	Environment	Interdependence	Patterns
Permeability	Plant growth	Population	Soil
Trait	Volume	Watershed	

VOCABULARY:

Anaerobic	Conservation	Consumers	Culvert
Decomposers	Density	Deposition	Detritus
Diversity	Ecosystem	Erosion	Estuary
Food chain	Graduated cylinder	Interdependence	Invasive species
Matter	Permeability	<i>Phragmites</i>	Population
Porous	Producers	Refractometer	Salinity
Solutions	Traits	Transect	Volume
Watershed	Wetland		





ESSENTIAL UNDERSTANDING	GUIDING QUESTIONS	ENABLING ACTIVITIES
Marshes are low lying, wet regions that serve many functions such as: purifying the environment, providing shelter for migratory birds, serving as breeding grounds for many animals, and acting as buffer zones that protect flooding and erosion	What are the characteristics of a wetland?	<u>Wetland Metaphors*</u>
Short-term changes in water level, salinity, and moisture may result in a change in the number of organisms of an ecosystem	How do changes in salinity and water level affect fish and vegetation in a wetland?	<u>Water's Going On*</u> Salinity Field Lab Fish Field Lab Vegetation Transect
<i>Phragmites</i> is an example of new plant population in the salt marsh resulting from dramatic short term changes caused by human impact (tidal restrictions, drainage in soil elevation)	What human actions result in the growth of <i>Phragmites</i> ? Is this a positive or negative impact?	Research utilizing multiple lines of inquiry (Mass Audubon website, interviews with Conservation Commission members, and field investigations).
Human activity has had a negative impact on wetland by pollution and changing land forms and water bodies	What negative impacts do humans have on wetland ecosystems?	Wetland video. Mapping human impact on a local salt marsh <u>A Grave Mistake*</u>
Humans can have a positive impact on an ecosystem through conservation, restoration, and protection through legislation.	How can humans positively impact this ecosystem?	Wetland Protection Act: Mock Conservation Commission hearing Web-site: Restoration
Plants and animals interact with each other and non-living parts of their environment.	How do organisms on a salt marsh interact with each other and with non-living things?	<u>Salt Marsh Players*</u> <u>Wetland Metaphors*</u>
Plants and animals interact in a variety of ways. Energy flows through the ecosystem as matter is cycled and recycled through these interactions.	Describe a food chain as an example of energy flow in a salt marsh?	<u>Marsh Munchers*</u>

ESSENTIAL UNDERSTANDINGS	GUIDING QUESTIONS	ENABLING ACTIVITIES
Organisms serve functions in a food chain as producers, consumers, and decomposers	What are producers, consumers, and decomposers? What organisms have these roles in a salt marsh ecosystem?	<u>Marsh Munchers*</u>
Salt Marsh soil is formed by the decomposition of dead plant and animal (detritus) and the deposition of tidal sediments.	How is soil formed on a salt marsh?	<u>How Thirsty is the Ground?*</u> <u>Do You Dig Wetland Soil?*</u>
Decomposition in salt marsh soil is slowed by anaerobic conditions created by saturated soil.	Why does a salt marsh smell?	<u>How Thirsty is the Ground?*</u> <u>Do You Dig Wetland Soil?*</u>
Rain falls and moves by gravity from higher to lower areas. This natural flow region is called the watershed. The _____ (give an example in your region) is an example of a watershed.	How does the _____ region act as a watershed? How does water-flow in the _____ region, include reference to both the water and tide cycles?	<u>Color Me a Watershed*</u> <u>The Incredible Journey (water cycle)*</u> <u>Get the Groundwater Picture*</u>
A fish or plant species in the salt marsh can be identified by observing common traits of the organism (body shape, location of fins). Within the same species, organisms may also have minor differences in physical characteristics (variations in color, size, etc.)	What characteristics are helpful in identifying fish and plants? What traits vary within a species?	Identify fish and plants using a dichotomous key, and labeled diagrams.
Tables, models, demonstrations, and graphs help represent and communicate scientific findings.	What are effective ways for organizing and representing scientific data? Which forms of data representation best illustrates the idea you are trying to convey?	Recording data in charts. Graphing results. (Excel or manually). Posters, Internet, lab report.
Tools are useful in gathering and representing quantitative data.	How can scientific tools be used to investigate human impact on the salt marsh?	Use refractometer, graduated cylinder, transect tape, meter sticks, binoculars, digital camera, soil probe, flags, appropriately.

ESSENTIAL UNDERSTANDINGS	GUIDING QUESTIONS	ENABLING ACTIVITIES
You prior knowledge is useful in making predictions and formulating hypotheses.	Based on your past experience, what predictions can you make regarding fish populations, salinity, and <i>Phragmites</i> growth?	Salinity Field Lab** Fish Field Lab** Vegetation Transect**

- From Project WET Curriculum and Activity Guide (supplemental activities) Published by the Watercourse and Council for Environmental Education (CEE)

** From Mass Audubon Salt Marsh Science Field Guide and Data Book

A. Process:

Observe and identify marsh plants; record information on vegetation transect data table

Skills:

1. Compare and contrast traits of different plant species
2. Read and follow a dichotomous plant identification key
3. Measure plants to nearest tenth of a centimeter.
4. Be able to record findings in appropriate columns and rows of a data table.
5. Read a tape measure in metric units.
6. Work cooperatively in groups.
7. Collect and share data.
8. Graph and analyze data.
9. Compare data with another site, or past data.
10. Listen to and follow directions

B. Process:

Participate in fish population study in a tidally restricted area.

Skills:

1. Compare actual fish with detailed diagrams
2. Observe distinguishing characteristics of salt marsh fish in order to identify them
3. Formulate hypothesis on amount of fish trapped in different regions of a tidal restricted area
4. Be able to collect and count samples from the traps
5. Use a graduated cylinder to determine volume of fish throughout water displacement
6. Work cooperatively in groups
7. Graph and analyze data.
8. Compare data with another site, or past data.
9. Listen to and follow directions.

C. Process:

Participate in a study of salinity levels in groundwater from different regions in the salt marsh

Skills:

1. Identify *Phragmites* and other marsh plants in regions where wells are planted.
2. Using a map, students must be able to locate well sites on the marsh
3. Predict levels of salinity at different sites and depths
4. Use a refractometer accurately
5. Justify predictions using background knowledge
6. Record information on a data sheet.
7. Work cooperatively in groups.
8. Collect and share data.
9. Graph and analyze data.
10. Compare data with another site, or past data.
11. Listen to and follow directions

D. Process

Create a map of a local salt marsh.

Skills

1. Observe natural features and evidence of human impact on salt marsh
 - a. Students need to be able to know and use geographical directions of North, South, East, and West.
 - b. Place oneself on map.
 - c. Sketch and draw important features of the area, including: wildlife, plant types, human impact.
 - d. Create a map key with appropriate symbols.
 - e. Listen to and follow directions.

Assessments for Enabling Activities

1. Audubon Vocabulary Quiz
2. Successful completion of salinity, vegetation, and fish data sheets.
3. Completion of map on the Mill Pond region complete with key and appropriate symbols.

Culminating Performance Tasks

1. Demonstration of mock Conservation Committee hearings.
2. Exhibition of student work. Display of photographs, posters, data, findings, poems, and artwork etc.

Performance Assessment

1. Lab Report Rubric (see attached)
2. Poster Rubric (see attached)

Vocabulary

anaerobic: living or growing where there is no oxygen

conservation: To protect, or minimize use of.

consumers: An organism that ingests other organisms or organic material in a food chain.

culvert: A pipe or opening that allows water to flow under a road.

detritus: Disintegrated material and debris, as from organic decomposition.

decomposers: Any of various organisms (as many bacteria and fungi) that feed on and break down organic substances (such as dead plants and animals.)

decomposition: The separation or breaking down of a substance into its component parts.

density: quantity of matter in a unit of volume.

deposition: The process of laying down sediment or accumulating layers of material carried in suspension.

diversity: Variety

ecosystem: An ecological community together with its environment, functioning as a unit.

environment: The combination of external physical, chemical and biotic factors affecting the growth and development of an organism or ecologic community.

erosion: Wearing away, such as land by the action of water.

exotic species: Species that are foreign to an environment, having come from another part of the world.

estuary: The lower course of a river where the current is met by ocean tides.

food chain: The transfer of food energy in sequence from plants to animals that eat plants to animals that eat other animals.

food web: The complex of interrelated food chains in an ecological community whereby food energy passes among organisms as each consumes and in turn is preyed upon by others.

impermeable layer: A layer of material (e.g. clay) in an aquifer through which water does not pass.

interdependence: Dependence on each other.

invasive plant: A plant that moves in and takes over an ecosystem to the detriment of other species.(often the result of environmental manipulation.)

matter: What things are made of.

neap tide: The tide with the least difference between low and high tide

***Phragmites australis*:** A tall reed, known to be invasive in wetlands.

population: A group of organisms that live in a particular location or region

permeable: Capable of transmitting water. (e.g. porous rock, sediment, or soil.)

permeable layer: A layer of porous material (rock, solid, sediment) in an acquifer, the layer through which water freely passes as it moves through the ground.

porous: Full of pores or tiny holes

producers: A photosynthetic green plant that constitutes the first nutritional level in a food chain.

refractometer: A tool for measuring salinity.

restoration: The act or process of bringing something back to a previous condition or position.

salinity: The degree of saltiness, usually referring to water.

solution: A mixture that forms when one substance dissolves another.

spring tide: The greatest range of high and low tide, occurring near the time of the full moon and new moon.

storm drain: Constructed opening in a road system through which runoff from the road surface flows into an underground pipe system. This is typically discharged, untreated.

traits: Quality, characteristic, feature.

transect: Marked line along which scientific sampling or surveying is undertaken.

transition zone: The area between distinct environments.

uplands: Land which is neither a wetland, nor covered with water.

volume: The amount of space occupied by something.

watershed: The entire land area that contributes surface runoff to a given drainage system.

wetland: A landform characterized by the presence of water, hydric soils, and hydrophytic vegetation. Often a wetlands is the transition zone between upland and deep-water environments.

Vocabulary Quiz #1 Answer Sheet

Fill in the word next to the definition:

Word Bank: volume, salinity, invasive plant, estuary, exotic species, detritus, culvert, transect, refractometer, *Phragmites australis*, erosion, deposition, wetland, ecosystem, conservation, watershed, solution, spring tide, neap tide, decomposition, restoration, storm drain, transition zone, upland

1. **deposition:** The process of laying down sediment or accumulating layers of material carried in suspension.
2. **ecosystem:** An ecological community together with its environment, functioning as a unit.
3. **estuary:** The lower course of a river where the current is met by ocean tides.
4. **conservation:** To protect, or minimize use of.
5. **culvert:** a pipe or opening that allows water to flow under a road.
6. **transect:** Marked line along which scientific sampling or surveying is undertaken.
7. **transition zone:** The area between distinct environments.
8. **upland:** Land which is neither a wetland, nor covered with water.
9. **volume:** the amount of space occupied by something.
10. **wetland:** A landform characterized by the presence of water, hydric soils, and hydrophytic vegetation. Often a wetlands is the transition zone between upland and deep-water environments.
11. **spring tide:** The greatest range of high and low tide, occurring near the time of the full moon and new moon.
12. **storm drain:** Constructed opening in a road system through which runoff from the road surface flows into an underground pipe system. This is typically discharged, untreated.
13. **detritus:** disintegrated material and debris, as from organic decomposition.
14. **erosion:** Wearing away, such as land by the action of water.
15. **exotic species:** Species that are foreign to an environment, having come from another part of the world.
16. **invasive plant:** a plant that moves in and takes over an ecosystem to the detriment of other species.(often the result of environmental manipulation.)
17. **neap tide:** The tide with the least difference between low and high tide,
18. **refractometer:** A tool for measuring salinity.
19. **restoration:** the act or process of bringing something back to a previous condition or position.
20. **salinity:** The degree of saltiness, usually referring to water.

5 points each, two are for extra credit, one point each.

Extra credit:

21. **watershed:** The entire land area that contributes surface runoff to a given drainage system.
22. ***Phragmites australis*:** A tall reed, known to be invasive in wetlands.

Vocabulary Quiz #2 Answer Sheet

Fill in the word next to the definition:

Word Bank: population, interdependence, detritus, consumers, traits, producers, permeability, ecosystem, density, conservation, watershed, solution, porous, matter, food chain, food web, diversity, decomposers, anaerobic, permeable layer, impermeable layer, decomposition, environment

Vocabulary Quiz #2

1. **anaerobic:** living or growing where there is no oxygen
2. **consumers:** An organism that ingests other organisms or organic material in a food chain.
3. **decomposers:** Any of various organisms (as many bacteria and fungi) that feed on and break down organic substances (such as dead plants and animals.)
4. **decomposition:** The separation or breaking down of a substance into its component parts.
5. **density:** quantity of matter in a unit of volume.
6. **diversity:** variety
7. **environment:** The combination of external physical, chemical and biotic factors affecting the growth and development of an organism or ecologic community.
8. **food chain:** The transfer of food energy in sequence from plants to animals that eat plants to animals that eat other animals.
9. **food web:** The complex of interrelated food chains in an ecological community whereby food energy passes among organisms as each consumes and in turn is preyed upon by others.
10. **impermeable layer:** A layer of material (e.g. clay) in an aquifer through which water does not pass.
11. **interdependence:** dependence on each other.
12. **matter:** What things are made of.
13. **permeable:** Capable of transmitting water. (e.g. porous rock, sediment, or soil.)
14. **permeable layer:** A layer of porous material (rock, solid, sediment) in an aquifer, the layer through which water freely passes as it moves through the ground.
15. **porous:** full of pores or tiny holes
16. **producers:** A photosynthetic green plant that constitutes the first nutritional level in a food chain.
17. **solution:** a mixture that forms when one substance dissolves another.
18. **traits:** quality, characteristic, feature.
19. **population:** a group of organisms of the same species that live in a particular location or region
20. **detritus:** disintegrated material and debris, as from organic decomposition.

5 points each

Vocabulary Quiz #1

Name: _____

Fill in the word next to the definition:

Word Bank: volume, salinity, population, invasive plant, estuary, exotic species, detritus, culvert, transect, refractometer, *Phragmites australis*, interdependence, erosion, deposition, consumers, wetland, traits, producers, permeability, ecosystem, density, conservation, watershed, solution, porous, matter, food chain, food web, diversity, decomposers, anaerobic, permeable layer, impermeable layer, spring tide, neap tide, decomposition, restoration, storm drain, transition zone, upland

1. _____ The process of laying down sediment or accumulating layers of material carried in suspension.
2. _____ An ecological community together with its environment, functioning as a unit.
3. _____ The lower course of a river where the current is met by ocean tides.
4. _____ To protect, or minimize use of.
5. _____ A pipe or opening that allows water to flow under a road.
6. _____ Marked line along which scientific sampling or surveying is undertaken.
7. _____ The area between distinct environments.
8. _____ Land which is neither a wetland, nor covered with water.
9. _____ The amount of space occupied by something.
10. _____ A landform characterized by the presence of water, hydric soils, and hydrophytic vegetation. Often a wetlands is the transition zone between upland and deep-water environments.
11. _____ The greatest range of high and low tide, occurring near the time of the full moon and new moon.
12. _____ Constructed opening in a road system through which runoff from the road surface flows into an underground pipe system. This is typically discharged, untreated.
13. _____ Disintegrated material and debris, as from organic decomposition.
14. _____ Wearing away, such as land by the action of water.
15. _____ Species that are foreign to an environment, having come from another part of the world.
16. _____ A plant that moves in and takes over an ecosystem to the detriment of other species (often the result of environmental manipulation).
17. _____ The tide with the least difference between low and high tide,
18. _____ A tool for measuring salinity.
19. _____ The act or process of bringing something back to a previous condition or position.
20. _____ The degree of saltiness, usually referring to water.

Extra Credit:

21. _____ The entire land area that contributes surface runoff to a given drainage system.
22. _____ A tall reed, known to be invasive in wetlands

Vocabulary Quiz #2

Name: _____

Fill in the word next to the definition:

Word Bank: volume, salinity, population, invasive species, estuary, exotic species detritus, culvert, transect, refractometer, *Phragmites australis*, interdependence, erosion, deposition, consumers, wetland, traits, producers, permeability, ecosystem, density, conservation, watershed, solution, porous, matter, food chain, food web, diversity, decomposers, anaerobic, permeable layer, impermeable layer, spring tide, neap tide, decomposition, restoration, storm drain, transition zone, upland, environment, impermeable layer, permeable layer,

Vocabulary Quiz #2

1. _____ Living or growing where there is no oxygen
2. _____ An organism that ingests other organisms or organic material in a food chain.
3. _____ Any of various organisms (as many bacteria and fungi) that feed on and break down organic substances (such as dead plants and animals.)
4. _____ The separation or breaking down of a substance into its component parts.
5. _____ Quantity of matter in a unit of volume.
6. _____ Variety
7. _____ The combination of external physical, chemical and biotic factors affecting the growth and development of an organism or ecologic community.
8. _____ The transfer of food energy in sequence from plants to animals that eat plants to animals that eat other animals.
9. _____ The complex of interrelated food chains in an ecological community whereby food energy passes among organisms as each consumes and in turn is preyed upon by others.
10. _____ A layer of material (e.g. clay) in an aquifer through which water does not pass.
11. _____ Dependence on each other.
12. _____ What things are made of.
13. _____ Capable of transmitting water. (e.g. porous rock, sediment, or soil.)
14. _____ A layer of porous material (rock, solid, sediment) in an aquifer, the layer through which water freely passes as it moves through the ground.
15. _____ Full of pores or tiny holes
16. _____ A photosynthetic green plant that constitutes the first nutritional level in a food chain.
17. _____ A mixture that forms when one substance dissolves another.
18. _____ Quality, characteristic, feature.
19. _____ A group of organisms of the same species that live in a particular location or region
20. _____ Disintegrated material and debris, as from organic decomposition

Lab Report Format

Title

Problem:

(1-2 sentences – can be in question format)

What are you trying to find out in this experiment?

Hypothesis:

(Predictions and why do you think this will happen?)

Materials:

(List all the items you used in this experiment)

Procedure:

(Directions needed to conduct the experiment)

1. Label one cup with the letter “A”
2. Measure one teaspoon of vinegar
3. Place the measured vinegar in cup A

Data:

(Charts, graphs, pictures, observations, etc.)

Results:

(1 paragraph)

*Using your data, briefly state what happened at the end of this experiment

Conclusion:

Two paragraphs:

First Paragraph

Were your predictions right? Were they wrong?

Why do you think you got the results you did?

Second Paragraph

Were there any problems in your experiment?

Would you do this experiment again?

If so, what would you do different?

PUTTING IT ALL TOGETHER LAB REPORT

Title: Write a name for your investigation

Question: State the problem in the form of a question

Materials: Make a list of the materials used in your investigation

Hypothesis: Write an if.... then statement that explains what you think will happen in your investigation.

Experiment design: Explain the steps you are going to take to investigate your question.

- 1.
 - 2.
 - 3.
- Etc.

Results:

Conclusion: Compare your results to your hypothesis. Tell if your results support or refute your hypothesis.

DATA OPTIONS:

A. Research: Search the internet, library, and other data sources to find the current scientific knowledge about this topic or problem. Look at past data collected at www.massaudubon.org/saltmarsh.

B. Pictures/diagrams: Draw diagrams or take pictures to show your results.

C. Data collected: Make systematic observations. Take accurate measurements. Organize the data into tables and charts and refer to them in your Results and Conclusion.

D. Data Display: Design a way to present your data in poster format or PowerPoint presentation.

Name _____ Homeroom _____

Lab Report Rubric

Presentation (total = 3)

3	Unique cover design or report presentation, typed report. Report draws attention to significant information, statements or parts of the report.
2	Neat cover with title and name, blue or black ink, neat and legible. Use of headings (bold face or underlined) when needed, margins & indentation used.
1	Illegible, messy with scratch-outs, tears, fringes, missing title & name.

Mechanics (total = 3)

3	No spelling errors, high quality sentence structure.
2	Few minor spelling & writing errors which do not interfere with meaning.
1	Spelling & sentence errors make the report hard to understand.

Content (total = 9)

Title & materials

3	Unique title, materials list is 100% specific & nothing is missing.
2	Title adequately describes the experiment but is short, minor errors in material.
1	Title is too general to describe the experiment, one would not be able to do then experiment with the materials list provided due to missing information.

Problem & hypothesis

3	Fully developed hypothesis with reasoning & scientific evidence to support your prediction.
2	Prediction with reasoning why, and mention of testing. (7 sentences)
1	Prediction cannot be explained scientifically, does not explain why.

Data, results & conclusions

3	Unique graphs, charts, well thought out, high quality conclusion including an explanation why all parts of the hypothesis were supported or not.
2	Clearly stated results and data, mention of results compared to what you thought would happen and you tried to explain why.
1	Unclear, incomplete results, did not try to explain why things worked or didn't work.

TOTAL POINTS (Total = 15) _____

POSTER RUBRIC

Name _____

Homeroom _____

Date Due _____

SCIENCE

PRESENTATION (Total Points = 3)

Is my poster?

- neat
- put together well
- appropriate coloration

WRITTEN CONTENT

(Total Points = 6)

Does my poster investigate major scientific questions about my topic?

Did I answer the question in my heading completely?

Do I mention scientists' names and their discoveries or theories?

Did I define or write a synonym for difficult, new science words?

Do I explain my topic's key points?

ORGANIZATION (Total Points 3)

Does my poster have a title and at least four headings in the form of a question?

Did I include at least 1 labeled diagram, chart or graph that explains a main point about my topic?

Did I include photographs and/or pictures in a good place on my poster?

TOTAL POINTS (Total = 12)

PERCENTAGE:

SCIENCE GRADE:

The following tips come from
A World in Our Backyard:
A Wetlands Education and Stewardship Program.

Securing the Interest of Your Students:

- Design experiences that create a 'need to know' in students. Walking into a wetland or performing an experiment in the classroom surfaces why? How? And what? Questions. Getting students to begin their study by asking questions is guaranteed to lock them into the rest of the wetland study unit. There are a number of approaches you can take to get your students invested in their field work.
- Have students ask as many questions as they can think of. As they walk through the wetland ask students to think aloud, forming their observations into questions. For example: Wetlands are inhabited by a diversity of plants and animals. Why does this plant or animal inhabit this wetland? Water flows through the area in some manner. Why does water gather here? Wetlands are important ecosystems. How does the wetland purify my water? How is the wetland helpful during a flood?
- Record the students' questions. Take the list back to the classroom. Either you or your students can sort and categorize the questions to focus your study. Two or three questions may become the basis for a comprehensive study that includes water quality testing, plant and wildlife inventories, local development issues, or historical use of the wetland.
- You may want to approach the field trip as a way to prove that a particular area is in fact a wetland. Have the students work in teams and collect information on water, plants, and soils that will prove your hypothesis.

Pre-planning Checklist

- Urge students to wear appropriate clothing --- Long-sleeve shirts, long pants, waterproof boots, raingear, and an extra pair of socks. (See attached checklist)
- Have students pack a brown bag lunch with drink for the trip.
- Obtain permission from student's parents to take the field trip.
- Take plenty of chaperones. In general one adult per every 10 students.
- Make sure you and your students can identify poison ivy and poison sumac.
- Make sure you have a first aid kit, and know about student's allergies and health needs (such as asthma)
- Arrange to bring a cell phone

Establish the ground rules for students:

- ⇒ Carry in, carry out! Leave nothing but footprints, take only memories.
- ⇒ Do not pick any plants or remove any organisms.
- ⇒ Handle living organisms gently, respectfully, and with wet hands, always putting them back where they were originally found.
- ⇒ Be careful to avoid disturbing nesting wildlife - many birds are sensitive to intrusion while raising young.
- ⇒ Do not taste or eat anything.

⇒ Anyone who causes another person to become excessively wet or muddy will be given indoor assignments only.

Adapted From: *The Salt Marsh: A complete guide to conducting successful field trips for grades K-12*

Chaperones and their Responsibilities:

“Chaperones are one of the more important components of any field trip. The parents and teacher-aides are an extension of the staff and need to be actively involved with the students. Their role is to help make the class visit to the salt marsh safe, fun, and educationally rewarding.

Safety should be foremost in the chaperone’s mind. They should also be properly clothed and prepared to go into the salt marsh. They are expected to help teachers with disciplining, and ensuring that students participate.

If chaperones are hesitant to do any of the activities, students will sense this and lose enthusiasm for exploration and discovery.

A major part of any outdoor program is discovery. Chaperones need not know the names of everything, nor do they need to have all the answers. Chaperones are there to help the students explore, observe, and ask questions. Saying “I don’t know - how could we find out?” or “What do you think?” is ok; chaperones should help students to answer their own questions through careful observation...

Remember, recruit chaperones early, and be sure they understand and feel comfortable about all the plans and expectations for the day.”

Preparing Your Chaperones

Be sure to give your chaperones:

_____ A schedule, a description of the program, and directions.

_____ A list of what to wear and bring. Remember, chaperones should be dressed appropriately, and ready for action.

_____ Invite chaperones to attend classes when studying field trip topics.

Guidelines:

_____ Plan to have at least one chaperone for every 10 students.

_____ Have chaperones be responsible for one group of students for the entire day, as this helps them develop a working relationship with the students. Have students wear nametags to assist this process.

_____ Be sure to thank chaperones for all they have done to help make the trip a success.

_____ Tell them to plan on future trips, and if you can, give them dates.

Ensuring Student Safety:

Health Forms:

Group leaders should have health forms and permission slips for all students, parent aides, and educators with them on site.

Review the health forms and note any unusual allergies such as bee stings or health needs such as inhalers for asthma before your trip.

The hospital needs this information to treat injured persons. The hospital must also be able to reach a parent or guardian by phone in order to treat a child. Phone numbers for all participants should be easily accessible.

First Aid: Each group should come with a first aid kit. Groups occasionally choose to bring their school nurse on trips to handle any health needs.

What to Wear:

- Layered Clothing
- A hat
- Rain Gear (If it's wet out)
- Warm pants
- Rubber Boots, or sneakers that you can get wet.
- A name tag
- Sun screen

Bring with you:

- A lunch
- Drinks
- Extra shoes and socks

Preparing for your trip:

Checklist:

- Arrange to have a cellular phone.
- Plan all logistics for field trip.
- Prepare materials for the trip.
- Plan emergency procedures.
- Begin teaching salt marsh ecology in classroom.
- Recruit and designate chaperones.
- Provide chaperones with necessary information including schedules, and their expected role as a chaperone.
- Send "What to wear and bring" list home to parents and chaperones.
- Secure all necessary health forms and permission slips.
- Make name tags for students, educators, and chaperones.

- Divide your class into smaller groups, assigning one chaperone for every ten students.
- Have students use the restroom, prior to leaving the school.

Check list: Upon Arrival:

- Remind all group leaders of rendezvous times and places.
- Meet for all-group review of rules.
- Arrange students into pre-determined subgroups with chaperones.

Back at the school:

- Reinforce the experience with follow-up activities

Date _____

Dear _____

Thank you for chaperoning on _____.

“Chaperones are one of the more important components of any field trip. The parents and teacher-aides are an extension of the staff and need to be actively involved with the students. Their role is to help make the class visit to the salt marsh safe, fun, and educationally rewarding.

Safety should be foremost in the chaperone’s mind. They should also be properly clothed and prepared to go into the salt marsh. They are expected to help teachers with disciplining, and ensuring that students participate.

If chaperones are hesitant to do any of the activities, students will sense this and lose enthusiasm for exploration and discovery.

A major part of any outdoor program is discovery. Chaperones need not know the names of everything, nor do they need to have all the answers. Chaperones are there to help the students explore, observe, and ask questions. Saying “I don’t know - how could we find out?” or “What do you think?” is ok; chaperones should help students to answer their own questions through careful observation...”

Thank you for participating in our field trip to the salt marsh. We would appreciate you arriving at school at

_____. Please go to _____. We will leave school at _____.

You will be assigned to work with a small group of eight to ten students. Please stay with your group, and keep them together as they walk through the marsh. Each group will go directly to their first lab. For example, group one will go to lab 1. Group 2 to lab 2 etc. A student leader will have a copy of the assigned rotation of the stations. There will be a teacher at each site to discuss/teach the lab. When your group has rotated through all five labs, you will need to lead them to the side road where they may write in their journals. Journals will be in the white buckets at the back of my car.

Please remember to dress in old pants, clothes, boots and rainwear if necessary. Students should have used the bathrooms at school before leaving, please see a homeroom teacher in case of emergency. In case of an emergency we will have a **cellular phone**, and a car.

Thank you for taking the time to chaperone and helping to make this trip a success.

Sincerely,

What to Wear:

- ___ Layered Clothing
- ___ A hat
- ___ Rain Gear (If it’s wet out)
- ___ Mittens or gloves
- ___ Warm pants
- ___ Rubber boots, or sneakers that you can get wet.
- ___ A name tag
- ___ Sun screen

Bring with you:

- ___ A lunch
- ___ Drinks

Ground rules for students:

- ⇒ Carry in, carry out! Leave nothing but footprints, take only memories.
- ⇒ Do not pick any plants or remove any organisms.
- ⇒ Handle living organisms gently, respectfully, and with wet hands, always putting them back where they were originally found.
- ⇒ Be careful to avoid disturbing nesting wildlife - many birds are sensitive to intrusion while raising young.
- ⇒ Do not taste or eat anything.
- ⇒ Anyone who causes another person to become excessively wet or muddy will be given indoor assignments only.