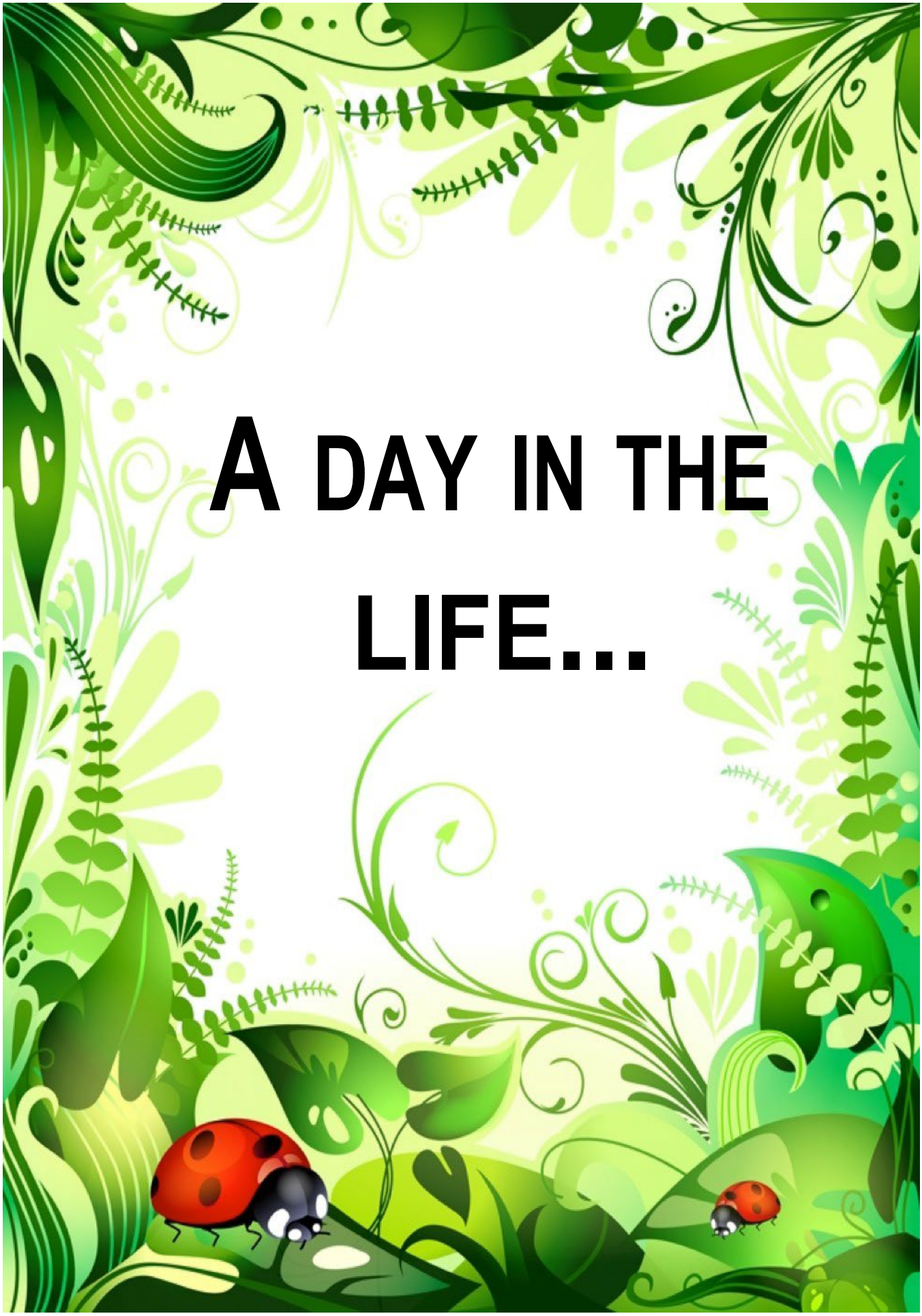
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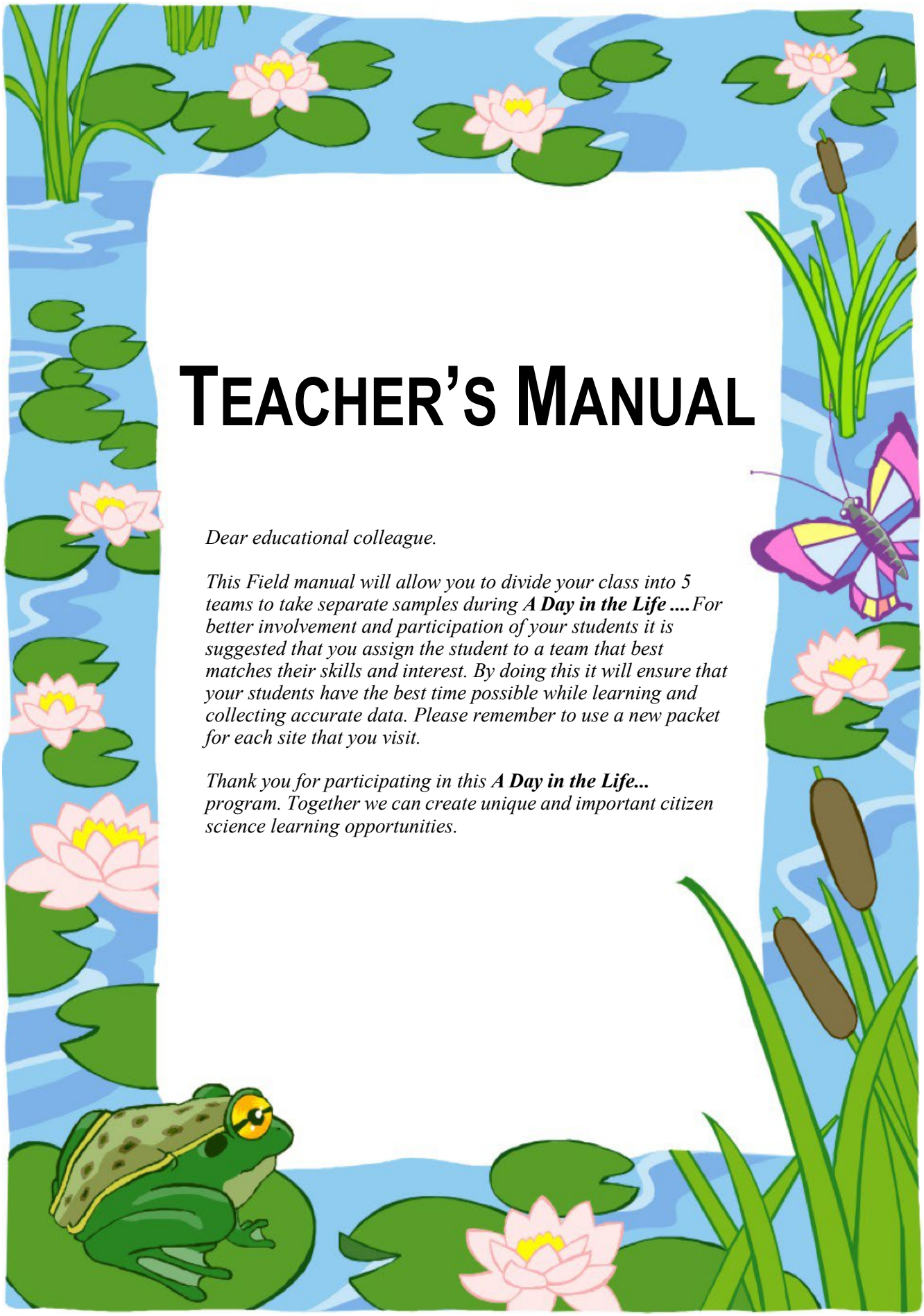

TEACHER'S MANUAL

Dear educational colleague.

*This Field manual will allow you to divide your class into 5 teams to take separate samples during **A Day in the Life ....**For better involvement and participation of your students it is suggested that you assign the student to a team that best matches their skills and interest. By doing this it will ensure that your students have the best time possible while learning and collecting accurate data. Please remember to use a new packet for each site that you visit.*

*Thank you for participating in this **A Day in the Life...** program. Together we can create unique and important citizen science learning opportunities.*

GROUP TASK BREAKDOWN

Group 1 - PHYSICAL DATA (pages 1-7)

Tasks and Measurements to Accomplish:

a. Tide Measurement
b. Current Direction and Speed
c. Air Temperature, Cloud Cover, & Wind

Group 2 - SITE DESCRIPTION (pages 8-12)

Tasks and Measurements to Accomplish:

a. Physical Characteristics of the Site
b. Map of Site
c. Sediment Sample of Shoreline and Site Bottom

Group 3 - BIOLOGICAL SAMPLING (pages 13-20)

Tasks and Measurements to Accomplish:

a. Aquatic Biological Survey
b. Habitat Association Survey

Group 4 - CHEMICAL ANALYSIS (pages 21-26)

Tasks and Measurements to Accomplish:

a. Water Temperature, Dissolved Oxygen, pH
b. Salinity and Turbidity
c. Phosphate, Nitrate, and Fecal Coliform Bacteria (See Appendix A- pages 30-31)

Group 5 - DOCUMENTATION (pages 27-29)

Tasks and Measurements to Accomplish:

a. Photographs of Site
b. Images of all Interesting Animals/Plants to be Identified
c. Images of other Group Members in Action

GROUP 1

PHYSICAL DATA

TIDE MEASUREMENT

CURRENT DIRECTION AND SPEED

AIR TEMPERATURE, CLOUD COVER, AND WIND

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GROUP 1: TIDE MEASUREMENT

What are Tides?

Tides are the 'up and down' motion or 'rising and falling' of water caused by the gravity of the Moon on our Earth. Long Island waters experience 2 high tides and 2 low tides each day which is not the case in other parts of the world.

Objective:

1) Measure the change in tides for your sampling site, using ***metric.***

Materials:

* Pencil
* Clipboards
* Tape Measure
* Two long, slender, strong sticks
* Timing device [Ex. stopwatch, watch, etc.]

Procedure:

Carefully read all directions before beginning the procedure!

Tide Measurement and Tidal Change:

1. Insert one stick deep into the sediment at exactly the water's edge. Pile stones at the base of the stick to give it extra support in order to hold it upright. Use your best judgement where the water's edge is if there are waves.

***Hint:** Make sure the stick is not placed in a location that will interfere with other teams!*

2. After 10 minutes, check your tide marker. If the water's edge has moved in either direction, use the second stick (planting it the same way as the first one) to mark the new edge. Do not move the first stick!

3. Measure the distance between the first and second stick to get a change in tide.

***Note:** Stick 1 will eventually become stick 3 after the first 10-minute measurement*

4. Continue measuring the tides for at least 30 minutes

Time	Vertical Tidal Change (between stick #1 & #2)	Rising, falling or unchanged
0		
10 minutes		
20 minutes		
30 minutes		

OVERALL VERTICAL TIDAL CHANGE = _____

GROUP 1: CURRENT DIRECTION AND SPEED

What is a Current?

A current is the internal movement of water, sometimes described as a push or pull in the river or bay. Scientists will often measure the direction the current is flowing and calculate current speed.

Objective:

1) Determine the direction of the water current
2) Calculate water current speed

Materials:

* Pencil
* Calculator
* Metric Tape Measure
* Several floatable objects [Ex. oranges, sticks (~ the length of forearm)]
* Clipboards
* Timing device [Ex. stopwatch, watch, etc.]
* Compass

***Note:** You are using a stick or an orange instead of a float or water bottle because they are biodegradable. Please recover the object you use, if possible.*

Procedure: Carefully read all directions before beginning the procedure!

Current Direction:

1. Toss the orange or stick into the middle of the river or bay to allow the water current to move the object

2. As a group, observe which direction the object moves. This is also the water current direction!

3. Using the compass, determine the current direction (east, west, etc.).

   A. What type of object did you use to measure current direction? _____

   B. Water current direction _____

Current Speed: (Current speed = distance traveled / time)

1. Student #1 stands at the water's edge at the starting point with a floatable object in hand. Student #1 tosses the object in the water.

2. After floating/ moving for 60 seconds, Student #2 will quickly line up with the floating object's position on the shoreline and call stop. This is the stopping point.

3. Using the **metric** measuring tape, record the distance between Student #1 and Student #2

4. Determine current speed three times at three different locations within your site. Average the results to get 'average current speed'. Record results below.

**If you note that the current appears to be different in the main channel than it is near the shoreline area please record this observation. The data from the main channel is the most useful. Please endeavor to get accurate readings from as close to mid-river/ mid- bay as possible.*

Don't forget your units!

	Location	Starting time	Stopping time	Distance object traveled (cm)	Direction	Current speed (cm/ sec)	Current Speed (knots)	Ebb, Flow, Slack or Tide
Trial 1								
Trial 2								
Trial 3								
Average	x	x	x	x	x			x

Current speed calculation example

Julia's orange traveled 125 cm in 60 seconds.

Her current speed =

Current speed = 2.08 cm/ second

Convert current speed (cm/ second) to knots

Current speed = 2.08 cm/ second

1 knot = 51.44 cm/ sec

2.08 / 51.44 = ***0.04 knots***

5. Convert current speed (cm/ sec) to knots. Use the conversion example above to assist your calculations. Record your data in the chart.

6. Record ebb, flood, or slack tide in data chart above.

River sites

- ***Ebb tide = current is moving downriver towards the bay***
- ***Flood tide = current is moving upstream***
- ***Slack tide = no change in water movement***

Bay sites

- ***Ebb tide = receding or outgoing tide***
- ***Flood tide = incoming or rising tide***
- ***Slack tide = no change in water movement***

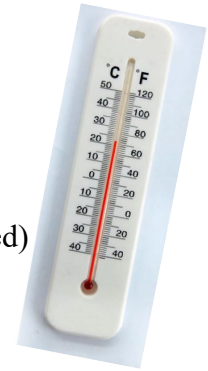
GROUP 1: AIR TEMPERATURE, CLOUD COVER, AND WIND

What is a Weather?

Weather includes current conditions and recent conditions at a particular place and time that may have an impact on the water quality of the river and bay.

Objective:

1) Record air temperature in BOTH Fahrenheit and Celsius
2) Estimate cloud cover
3) Determine wind direction and speed



Materials:

* Pencil
* Thermometer
* Beaufort Scale (See Diagram)
* Calculator (optional)
* Clipboards
* Anemometer (measures wind speed)
* Compass (optional)

Procedure: Carefully read all directions before beginning the procedure!

Air Temperature:

1. Record air temperature in BOTH Fahrenheit and Celsius once every hour, if possible (see chart below)
   ***Note:** Place your thermometer in a shady location, if possible*

Time	Air Temperature (° Fahrenheit)	Air Temperature (° Celsius)
	° F	° C
	° F	° C
	° F	° C

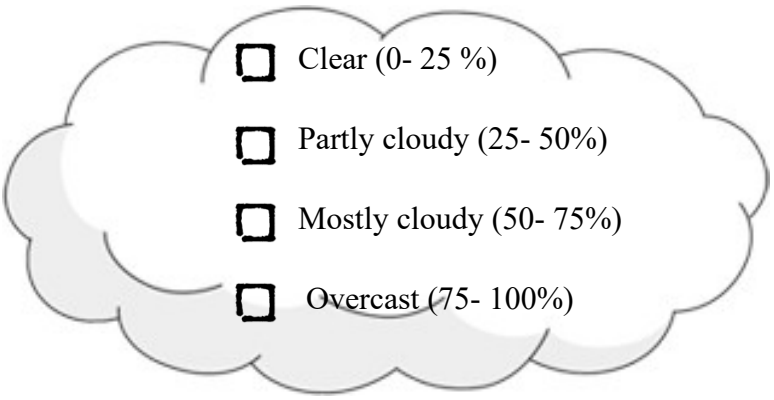
*If your thermometer is not able to read both Fahrenheit and Celsius, then you will need to use the conversion chart to assist you.

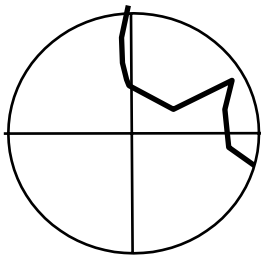
To calculate Celsius from Fahrenheit: ° C = (____° F --- 32) x 0.556

To calculate Fahrenheit from Celsius: ° F = (1.8 x____° C) + 32

Cloud Cover:

1. Estimate cloud cover





Ex. ~ 25% cloud cover or clear conditions

Wind Direction and Speed:

Wind levels can increase choppiness in the water adding oxygen to it. This is important for many of the animals that live in the river and estuary. Wind can affect the movement of surface water, making it difficult to determine current direction and speed.

1. Record wind direction using either the "water on the face method" or "flag method"

_____

***Remember:** Wind direction is determined by the direction the wind is blowing from*

2. Circle the descriptive word that best describes the conditions of the water.
   Virtually flat Calm Rippled Choppy

3. Measure wind speed by using BOTH an anemometer and the Beaufort Scale

   A. Using the anemometer, record wind speed_____knots or_____mph

   B. Using the Beaufort Scale (please refer to the next page), figure out which Beaufort Force # best describes wind speed _____

Beaufort Scale

Devised by British Rear - Admiral Sir Francis Beaufort in 1805 based on observations of the effects of wind on ocean water

Beaufort Scale	**Wind Speed** knots / mph	**Wave Height** feet	**Description**	**Effects Observed**
0	< 1 / < 1	-	calm	calm, water is like a mirror
1	1-3 / 1-3	0.25	light air	wind shown by smoke drift but not by wind vane; no foamy crests
2	4-6 / 4-7	0.5-1.0	light breeze	wind felt on face; leaves rustle; small wavelets
3	7-10 / 8-12	2-3	gentle breeze	leaves and twigs in constant motion; wind extends light flag; scattered whitecaps
4	11-16 / 13-18	3.5-5.0	moderate breeze	raises loose paper; small branches are moved; numerous whitecaps
5	17-21 / 19-24	6-8	fresh breeze	small trees begin to sway; many whitecaps, some spray
6	22-27 / 25-31	9.5-13	strong breeze	large branches in motion; large waves forming; whitecaps everywhere
7	28-33 / 32- 38	13.5-19	near gale	Whole trees in motion; white foam from breaking waves

GROUP 2

SITE DESCRIPTION

PHYSICAL CHARACTERISTICS OF THE SITE

MAP OF THE SITE

SEDIMENT SAMPLE OF THE SHORELINE AND SITE BOTTOM

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GROUP 2: PHYSICAL CHARACTERISTICS OF THE SITE

What are the physical characteristics of a site?

The physical characteristics of a sampling site are the geographic features. This includes trees, shrubs, dunes, river/ bay, buildings, parking lot, etc.

Objective:

1) Describe the shoreline of your sampling location
2) Create a site map
3) Work with the Documentation Team to take photos of your site from several angles

Materials:

* Pencil * Clipboards * GPS unit/ Phone with capabilities

Procedure: Carefully read all directions before beginning the procedure!

Shoreline Description:

1. Walk down to the shoreline. This is going to be your sampling site.

A. Identify the latitude and longitude of your sampling site _____

B. **Check** all of the characteristics that apply.

Sandy	Bulkhead	Vegetated (grasses, shrubs)
Road Ending	Rocky	Pipe entering river/bay
Gentle beach slope	Steep slope	Pier
Riprap (large amounts of rocks piled up)	Garbage	

* What are some other noteworthy features or characteristics of your sampling site (ex. muddy)

_____

C. River/ bay bottom is predominately **(circle one)**

Sandy *Muddy* *Rocky* *Weedy* *Unable to determine*

D. What percentage of the river/ bay bottom is covered in vegetation?

☐ 0- 25% ☐ 25-50% ☐ 50-75% ☐ 75-100%

E. What percentage of the river/ bay surface is covered in vegetation?

☐ 0- 25% ☐ 25-50% ☐ 50-75% ☐ 75-100%

GROUP 2: MAP OF THE SITE

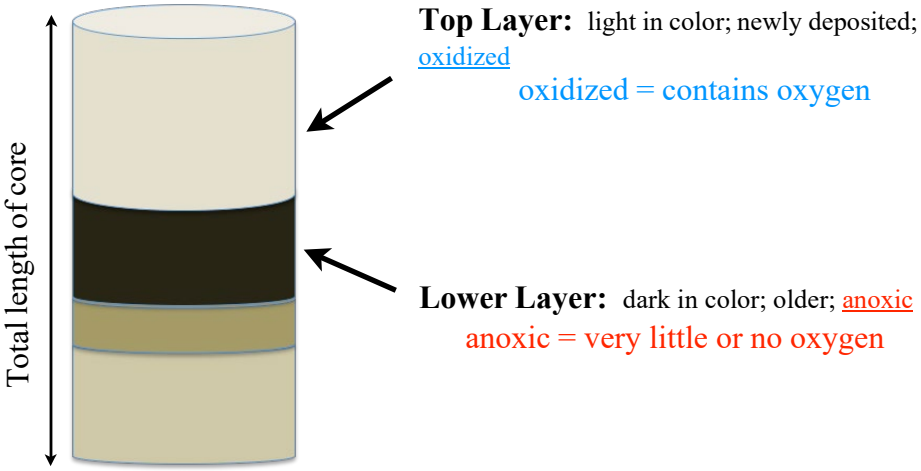
Sketch a Site Map:

Locate your sampling site. Sketch a detailed map of your location. Include features found within 100 feet on either side of you. Be sure to include any physical characteristics that may help others identify your sampling site and label them accordingly.

GROUP2: SEDIMENT SAMPLE OF THE SHORELINE & SITE BOTTOM

What is a Sediment?

Sediment is solid matter that can be moved and deposited by wind and water. It comes in many forms and sizes and from a variety of sources. Collecting a sediment core and studying the different layers, organisms, and even gases present in the core is a helpful way of determining the geographical profile of an area. You can not tell how many years your core represents by simply looking at it. The amount of time represented by your core will range depending upon the location chosen and the processes of weather, current, and sedimentation. In areas with high deposition, it might be only a few weeks represented versus in other areas the same length of core might represent decades.



Actual sediment core

Objective:

1) Collect and observe a sediment core sample

Materials:

* Pencil
* Ruler
* Tray/ bin
* Clipboards
* Sediment Corer (tube, rubber mallet)

Procedure: Carefully read all directions before beginning the procedure!

Sediment Core Collection :

1. Find an area in the water where the sediment is soft enough to push the end of a sediment corer into. Push the sediment core into the bottom at least 3/4 of the way down. You may have to try several locations or use the rubber mallet to help get a good length into the substrate. Choose a spot that is not too deep for your team to work.

1. Carefully, withdraw the sediment corer from the water. Keep the core upright as you move it to collection tray or bin for observation. Position one hand on the bottom of the corer and the other on the top (see photo above) to keep the sample steady.

2. If possible, slide the sediment core out of the tube onto the tray or bin.

A. Sketch a detailed picture of the sediment sample

***Remember:** Be sure to include the different layers, plants, animals, and other items you see*

B. Total length of your sediment core_____**cm**

C. Length of oxidized layer (if present)_____**cm**

D. Length of anoxic layer (if present)_____**cm**

* ***Interesting Fact:** The anoxic layer may have a sulfur-like or 'rotten egg' smell. This is from bacteria that thrive in anoxic zones and produce hydrogen sulfide (H_2S) as a respiratory waste product.*

F. Observe and dissect the sediment core. Fill out the chart below based on your findings.

	Absent	Rare	Common	Abundant	Additional Comments
Clay (feels thick & dense)					
Mud (smooth between fingers)					
Sand (gritty; fine sand paper)					
Gravel (pea-sized sediment)					
Pebbles (larger than pea-sized)					
Bivalve Shells (Ex. clam, oyster)					
Snail Shells (single shell)					
Macroinverts (Ex. worm, crab)					
Coal (black in color; less dense)					
Plant Material (Ex. leaves; grass)					

GROUP 3

BIOLOGICAL SAMPLING

AQUATIC BIOLOGY SURVEY

HABITAT ASSOCIATION SURVEY

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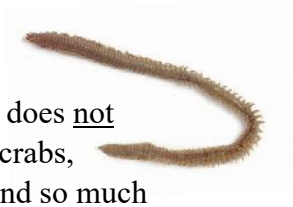
GROUP 3: AQUATIC BIOLOGICAL SURVEY

What is an Aquatic Biological Survey?

During an aquatic biological survey, the investigator identifies and counts each species of fish or macro-invertebrate that is caught during collection. This gives the scientist a better idea as to species diversity and overall health of a given site along the river or bay.



What is a macro-invertebrate?

A macro-invertebrate is an organism that is easily visible without magnification and does not have a vertebrate or backbone! Examples of common, aquatic macro-invertebrates include crabs, horseshoe crabs, barnacles, clams, oysters, snails, shrimp, jellyfish, sand hoppers, worms, and so much more!

Objective:

1) Conduct an aquatic biological survey to get a total number of each species caught, largest individual species, and overall total number of species

2) Calculate Catch Per Unit Effort (CPUE)

Materials:

* Pencil
* Measuring tape
* Collection buckets
* Net(s) for collection (seine *{required}*, dip nets, plankton, minnow, etc.)
* Clipboards
* Binoculars
* Reference guide (see attached)

Procedure: Carefully read all directions before beginning the procedure!

Fish & Macro-invertebrate Inventory Using a Seine Net:

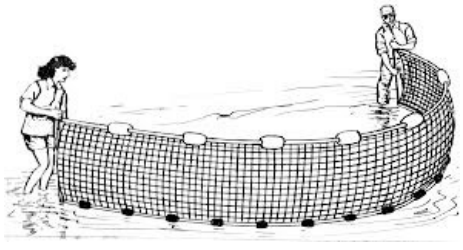
1. Students in Group #3 must have all of the Aquatic Biological Survey rules reviewed with them prior to starting this station. Below are a few of the most important rules!

***Respect all animals and equipment**
***No standing on the seine net**
***When picking the organisms out of the net, kneel alongside it**
***When the seine net is hauled to the beach, students are to kneel at its edge gently picking out the fish first and then other invertebrates (crabs, barnacles, shellfish, etc)**

2. Prior to seining, answer the following questions:

A. Length of the seine net_____feet Width of the seine net_____feet
Mesh size_____mm

B. Names of those using the seine net_____



3. While the seine is being pulled;

Remember: *Be sure to* ask *for assistance if you are unsure how to use a seine properly*

A. Record the distance the seine is pulled_____(units)

B. Fill buckets with water

4. Haul seine to the shoreline.

A. First, collect all fish and gently place into buckets ****Do not throw organisms!***

B. Second, collect all macro-invertebrates and gently place into buckets

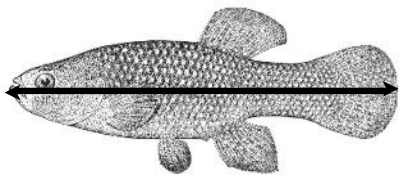
Remember: *Work quickly to get all living organisms into buckets of water and do* ***not*** *stand on the seine net!*

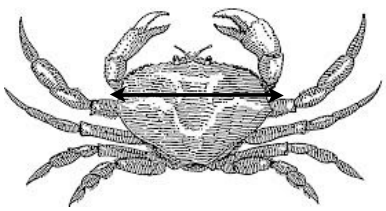
5. Use the reference guides to help identify each organism to the best of your abilities. Fill out the data chart. Have your Documentation Team take pictures of each species that you observe, especially those that you are unsure about!

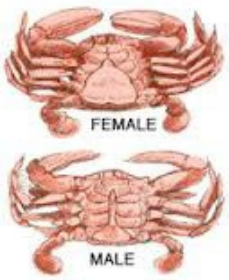
Remember: *If you have trouble identifying organisms to the species level, list them in the most specific level of classification possible. Young-of-the-year-herring (alewives, blueback herring, shad) look remarkably similar to one another. Group them together as 'herring' or 'sunfish'. Many killifish species also look similar to one another. If you are unsure, group them together as 'killifish'.*

6. Record the total number of each species counted during each seine pull in the data chart

7. Measure the largest individual of each species. For most species it will not be possible to determine gender, but for those that you can (ex. crabs) it is useful to know the ratios of the sexes of the samples.







Collection Method #1

*Record length of collection net and mesh size of the equipment used

Seine net **{required testing method}** _____

Dip net_____Crab Trap_____ Other_____

Length of Pull _____

Do not include in total!

	Species	Total # of individuals	Size of largest individual	Units (mm, cm)
Ex.	*Blue Crab (2 males)*	*2*	*8.5*	*cm*
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
	Total fish in collection #1			

Comments: _____

Collection Method #2

*Record length of collection net and mesh size of the equipment used

Seine net **{required testing method}** _____

Dip net_____Crab Trap_____ Other_____

Length of Pull _____

Do not include in total!

	Species	Total # of individuals	Size of largest individual	Units (mm, cm)
Ex.	*Atlantic Silverside*	*16*	*10*	*cm*
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
	Total fish in collection #2			

Comments: _____

Collection Method #3

*Record length of collection net and mesh size of the equipment used

Seine net **{required testing method}** _____

Dip net_____Crab Trap_____ Other_____

Length of Pull _____

Do not include in total!

	Species	Total # of individuals	Size of largest individual	Units (mm, cm)
Ex.	*Long-clawed hermit crab*	*8*	*1.8*	*cm*
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
	Total fish in collection #3			

Comments: _____

Collection Method #_____ *(make extra copies of this page if you expect to perform more than 3 pulls)*

*Record length of collection net and mesh size of the equipment used

Seine net **{required testing method}** _____

Dip net_____Crab Trap_____ Other_____

Length of Pull _____

	Species	Total # of individuals	Size of largest individual	Units (mm, cm)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
	Total fish in collection #			

Comments: _____

Aquatic Biological Survey Summary

Total # of collections conducted _____ **Total # of individuals counted**_____

GROUP 3: HABITAT ASSOCIATION SURVEY

What is a Habitat Association Survey?

A habitat association survey is an important record of the various organisms (birds, mammals, etc.) that are observed at your study site.

Objective:

1) Identify and count organisms at your study site during your visit

***Note:** If you are unsure of an organism, please describe it in the notes section below*

Materials:

* Pencil
* Binoculars
* Clipboards
* Reference guide

Procedure: Carefully read all directions before beginning the procedure!

Wildlife Inventory :

1. Spend some time observing the area around your study site. Using binoculars if possible, identify and count birds, mammals or other organisms seen during your visit to your study site. Record the organisms in the chart below. These are in addition to any organisms caught using nets in the river. Other teams' observations of animals should be included as well.

	Location	Species	Count
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

* Description of unknown organisms: _____

GROUP 4

CHEMICAL ANALYSIS

WATER TEMPERATURE, DISSOLVED OXYGEN, PH, PHOSPHATE, NITRATE, FECAL COLIFORM

AND

SALINITY AND TURBIDITY

Scan QR code to enter data for this section

GROUP 4: WATER TEMPERATURE, DISSOLVED OXYGEN, & PH

Water temperature, dissolved oxygen, and pH are important factors to study when learning about a specific study site. Organisms are adapted to survive in specific range of temperatures, pH, and dissolved oxygen (DO) before they become stressed.

Objective:

1) Record air temperature in BOTH Fahrenheit and Celsius
2) Measure dissolved oxygen
3) Measure pH

Materials:

* Pencil
* Clipboards
* Water thermometer
* LaMotte Water Quality Kit (DO & pH) **{required method}**
* pH reference guide (optional)

Procedure: Carefully read all directions before beginning the procedure!

1. Water Temperature:

Record in *situ* water temperature in BOTH Fahrenheit and Celsius every 15 or 30 minutes and then average the results (see chart below)

***Note:** It may help to have the thermometer securely tied to a string or lanyard for ease of use.

	Location	**Time**	**Temperature** ^{o}**C**	**Temperature** ^{o}**F**
Trial 1				
Trial 2				
Trial 3				
Average	X	X		

*If your thermometer is not able to read both Fahrenheit and Celsius, then you will need to use the conversion chart to assist you.

To calculate Celsius from Fahrenheit: ° C = (____ ° F - 32) x 0.556

To calculate Fahrenheit from Celsius: ° F = (1.8 x ____° C) + 32

2. Dissolved Oxygen (DO):

The amount of DO in a river or bay is one of the most important indicators of its health. Many variables influence DO including temperature, time of day, abundance of vegetation, and wind conditions. DO measurements are read in units of **mg/L**, **ppm** and/or as **percent saturation**. Plants and wind can add oxygen to the water and animal respiration can subtract oxygen from the water. Therefore, at night plants do not produce oxygen, and the organisms in the water continue to respire.

A. ***Circle*** the DO measuring method(s)

LaMotte Water Quality Kit **{required method}** Other_____

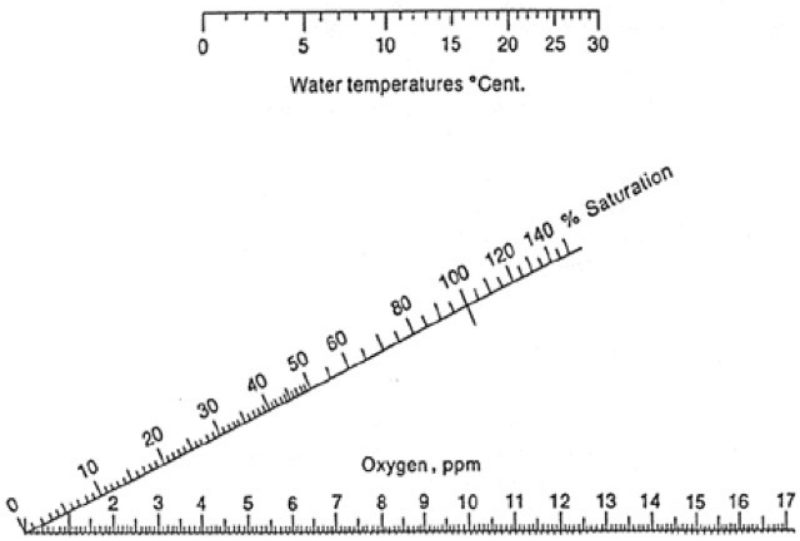
**Note:* Be sure to eliminate all air bubbles before testing!!!

Don't forget your units!

	Location	Time	Temperature °C	DO mg/L or ppm	% saturation (see chart below)
Trial 1					
Trial 2					
Trial 3					

B. Determining percent saturation:

For a relatively quick and easy determination of the percent saturation value for dissolved oxygen at a given temperature, use the saturation chart below. Pair up the measured mg/l of DO with the temperature of the water (in ° C), Draw a straight line (use a straight edge) between the two values. The % saturation is the value where your drawn line intercepts the angled saturation scale. Waterways with a saturation value of 90% or greater are generally considered healthy.



3. Water pH:

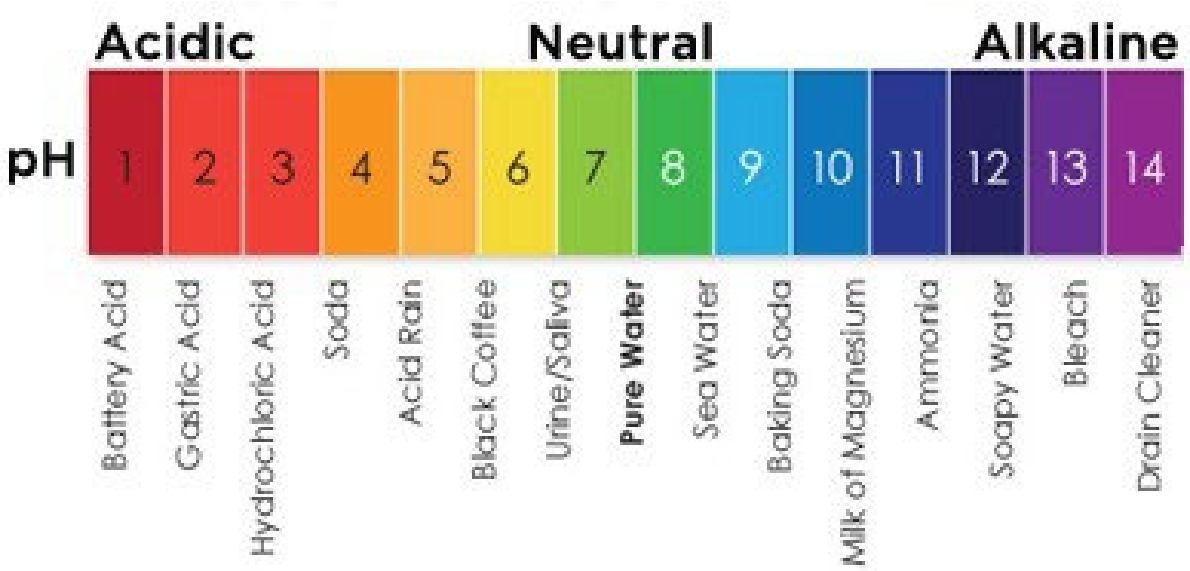
Most aquatic organisms are adapted to survive in a pH range between 6.8 - 8.0.

A. ***Circle*** the pH measuring method(s)

Litmus paper pH meter LaMotte Water Quality Kit **{required method}**
Indicator solution Other_____

B. Test water pH <u>three times at three different locations</u> within your site and average the results. Record results below.

	Location	**Time**	**Reading 1**	**Reading 2**	**Reading 3**	**Average**
LaMotte Water Quality Kit (required)						
Other Test Method (optional)						



Group 4: Phosphates, Nitrates and Fecal Coliform

Objective: 1) Measure phosphates
2) Measure nitrates
3) Preparation for fecal coliform bacteria test (to be completed in classroom/ laboratory)

Materials: * Pencil * Clipboard
* Timer * LaMotte Water Quality Kit

Procedure: Carefully read all directions before beginning the procedure!

1. Phosphate:

Phosphate is a nutrient required for plant and animal growth. High levels of phosphate can results in the overgrowth of plants, increased bacterial activity and decreased dissolved oxygen levels.

A. Using the LaMotte Water Quality Kit, measure phosphate levels three times at three different locations within your site and average the results. Record results below.

	Location	Time	Reading 1	Reading 2	Reading 3	Average (ppm)
LaMotte Water Quality Kit						

2. Nitrate:

The nutrient, nitrate, is necessary to build protein in all aquatic plants and animals. Excess levels of nitrate cause increased plant growth and decay, enhanced bacterial decomposition, and consequently a decrease in dissolved oxygen.

A. Using the LaMotte Water Quality Kit, measure nitrate levels three times at three different locations within your site and average the results. Record results below.

	Location	Time	Reading 1	Reading 2	Reading 3	Average (ppm)
LaMotte Water Quality Kit						

3. Fecal Coliform Bacteria:

Fecal coliform bacteria are present in the human digestive tract. When coliform bacteria is found in water, it reliably indicates the presence of fecal or sewage contamination ****This test requires a 48 hr incubation period. Therefore, a water sample should be collected and the test should be conducted back in the classroom/ laboratory. Please, note proper disposal methods for the coliform test in the LaMotte Water Quality Kit Manual.***

	Location of collection	Time of collection	Negative or Positive

GROUP 4: SALINITY AND TURBIDITY

Salinity and turbidity are factors that scientists study to better understand a specific study site. Organisms are only adapted to survive in a specific range of salinity and increased turbidity can negatively influence the biodiversity of the estuary or river.

Objective:

1) Measure salinity
2) Determine turbidity

Materials:

* Pencil
* Clipboards
* Salinity measurement Tool (hydrometer, refractometer, test strip, etc.)
* Turbidity measurement tool (Secchi disc, short sight tube, long sight tube, etc)

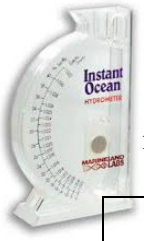
Procedure: Carefully read all directions before beginning the procedure!

1. Salinity:

Salinity is the measure of 'total salts', 'conductivity', or more specifically the concentration of Chloride ions (Cl^-). In freshwater parts of the river, the unit of measurement may be parts per million (ppm) or milligrams per liter (mg/ L). These two units are equivalent. In saltier parts of the bay, you may measure salinity in parts per thousand (ppt); one part per thousand equals 1000 mg/ L.

A. ***Circle*** the measuring method(s) used for salinity

Hydrometer Test strips LaMotte Water Quality Kit **{required method}**
Refractometer Other_____



B. Record salinity three times at three different locations within your site and average the results. Record results below.

	Location	Time	Reading 1	Reading 2	Reading 3	Average*
LaMotte Water Quality Kit (required)						
Other Test Method (optional)						

Typical Readings:

Fresher parts of the Peconic Estuary: 20- 30 mg/L or 0.02- 0.03 ppt
Saltier part of the Peconic Estuary: 25- 30 ppt
Atlantic Ocean: ~35 ppt

2. Turbidity:

Turbidity is a measure of water clarity, which is an important feature of an estuary. Different techniques for determining turbidity use different units of measurement.

A. ***Circle*** the measuring method(s) used for turbidity

Secchi disc Short sight tube/ LaMotte Water Quality Kit **{required}**

Long sight tube Turbidimeter Other_____

B. Record turbidity <u>three times at three different locations</u> within your site and then average the results. Record results below. Be sure to enter data on the correct line for the technique you use.

Technique	Location	Time	Reading 1	Reading 2	Reading 3	Average	Units
Secchi Disc							Feet or cm
Short Sight Tube							JTUs
Long Sight Tube							cm/meter
Turbidimeter							NTUs

GROUP 5

DOCUMENTATION

GROUP 5: DOCUMENTATION

Your responsibility is to record images and information about the field day. By taking digital pictures, short videos, asking questions and even interviewing the experts that are assisting your teams, you will gather information that may prove very valuable to the scientific data collected, and to questions that your classmates may ask later. You will also have handy images that can be used to demonstrate the groups' accomplishments.

Objective:

1) Take pictures of each group sampling in the field
2) Interview students, experts, and teachers during the sampling day
3) Take pictures of all the macro-invertebrates and fish observed in Group 3
4) Document the sampling site

***Note:** Please review 'Important Suggestions' at the bottom of this section*

Materials:

* Pencil
* Field notebook
* Digital cameras/ Documenting tools

Procedure:

2. Break students up into 4 different groups. Assign them one group to document during the length of the sampling day.

3. Write the name of each student assigned to document the various groups:

A. Group 1 (Physical Data) _____

B. Group 2 (Site Description)_____

C. Group 3 (Biological Sampling)_____

D. Group 4 (Chemical Data)_____

4. Students are journalists documenting the procedures and discoveries made throughout the day. Use your sense of artistry and creativity to get interesting angles, compositions and scenery.

A. Ask your assigned group or team if they have any questions for the experts. When time permits, ask these questions. Record the answers you get in your field journal. If the experts are unable to answer, you will submit these questions after the trip to your teacher who will find someone who can answer them.

B. In your field journal, keep track of the photos you have taken. It may not be necessary to write down each and every shot, but record them in blocks so that when reviewing the images, you have an idea of who or what is in each photo.

> ***For example:*** *1-22 group preparing at site*
> *23-44 weather data sampling*
> *45-47 cool swan swimming*
> *48-61 Mark and Rolanda pulling the net*
> *62-64 Sara holding mystery fish*
> *Etc.*

Important Suggestions:

- Take action photos of sampling techniques
- Take close-up photos of fish and invertebrates captured to aid in identification
- When taking photos of small creatures, use a coin or ruler in the shot as a size reference
- Take group photos of each team performing tasks
- Take group photos of the entire class
- Take photos of the experts in action
- Take photos of scenery, other animals, events occurring nearby
- Ensure you get photos of everyone