

# Chemical Station Materials & Methods

## Materials:

3 Tall Plastic Vials with Caps	1 Small Glass Vial with Cap
1 Nitrate Tablet #1	1 pH Tablet
1 Nitrate Tablet #2	1 Phosphate Tablet
2 Dissolved Oxygen (DO) Tablets	Color Comparison Charts

## Methods:

Record the date and time in the data book.

### Nitrate Test

1. Fill a tall plastic vial to the 5 mL line with water from the wetland.
2. Drop a Nitrate #1 tablet into the vial. Cap the tube and slowly mix until the tablet has dissolved.
3. Add one Nitrate #2 tablet. Cap the tube and slowly mix until the tablet has dissolved.
4. Wait for 5 minutes. Compare the color of the sample to the Nitrate Color Chart
5. Record nitrate in parts per million.

### Dissolved Oxygen Test

6. Fill the small glass vial to overflowing with water from the wetland.
7. Add TWO Dissolved Oxygen tablets into the vial. Cap the tube. Be sure that no air bubbles are in the sample. Mix by slowly inverting the vial until the tablets have dissolved.
8. Wait for 5 minutes. Compare the color of the sample to the Dissolved Oxygen Color Chart.
9. Record dissolved oxygen in parts per million.

### pH Test

10. Fill a tall plastic vial to the 5 mL line with water from the wetland.
11. Drop one pH tablet into the vial. Cap the tube and slowly mix until the tablet has dissolved.
12. Wait for 5 minutes. Compare the color of the sample to the pH Color Chart.
13. Record the pH.

### Phosphate Test

14. Fill a tall plastic vial to the 5 mL line with water from the wetland.
15. Add one Phosphorus tablet. Cap the tube and slowly mix until the tablet has dissolved.
16. Wait for 5 minutes. Compare the color of the sample to the Phosphate Color Chart.
17. Record phosphate in parts per million

**Dispose of ALL the vial water in the classroom SINK, not in the WETLAND**  
**Clean all materials used and return them to the bucket.**

## What to Record

- Date and Time
- Nitrate (in ppm)
- Dissolved Oxygen (in ppm)
- Phosphate (in ppm)
- pH
- The name of each participant and what they accomplished during the period
- Photo of at least one team member with a scientifically significant discovery & paste into SW book

# Physical Station Materials & Methods

## Materials:

- |   |  |
|---|--|
| Wind Compass  | Forel Ule Scale                          |
| 2 Thermometers  | Secchi Disk Container & Comparison Chart |
| Tennis Ball   | Stopwatch                                |
| Internet Access to <a href="http://www.intellicast.com">www.intellicast.com</a> |  |

## Methods:

Record the date and time in the data book.

### Wind Test

1. Hold the wind compass up into the air, with the back of the compass in the opposite direction of the wind.
2. Read the wind speed indicated on the wind compass, and record the speed in miles per hour.

### Water Color Test

3. Hold the Forel-Ule scale against a white background (paper) and compare the color of the wetland water to the colored vials within the Forel-Ule scale. Record the color as a roman numeral.

### Water Turbidity Test

4. Fill the clear plastic container to the black line.
5. Place the container onto the comparison chart.
6. Look down through the water and compare the visibility of the secchi disk to the comparison chart.
  - If the secchi disk is not visible when the container is filled to the black line with water, then empty half the water and try again. The result should then be multiplied by two.
  - If the secchi disk is still not visible, empty half the water (now at one-quarter) and try again. The result should then be multiplied by four.
7. Record your result in JTU (Jackson Turbidity Unit, also called NTU – Nephelometric Turbidity Unit)

### Air and Water Temperature Test

8. To measure the temperature of the wetland, hold one thermometer in the air and insert the other 3 to 4 inches into the water. After two minutes, read the temperature of both thermometers. Record your result in degrees Celsius.

### Water Flow Test

9. To measure flow rate, identify the area in the riffle zone with two wooden stakes one meter apart.
10. Measure the time (in seconds) it takes for the tennis ball to float the one meter between the stakes
11. Divide distance by time to calculate speed.
12. Record your result in meters per second.

### Daily Precipitation

11. Log on to <http://www.intellicast.com> and search for the zip code 27519. Click on “past observations” and record the “24 hour precipitation” in inches.

## What to Record

- Date and Time
- Turbidity (in JTU)
- Wind (in mph)
- Color (in roman numerals)
- Air Temperature (in °C)
- Water Flow (in m/s)
- Water Temperature (in °C)
- Precipitation (in inches)
- The name of each participant and what they accomplished during the period
- Photo of at least one team member with a scientifically significant discovery & paste into SW book

# **Benthic Macroinvertebrates Station Materials & Methods**

## **Materials:**

4 Dip Nets

Identification Chart for Macroinvertebrates

## **Methods:**

1. Record the date and time in the data book.
2. Look for all visible macro invertebrates beneath rocks that are in the riffle area, identifying each organism using the identification chart.
3. To find organisms in the grasses around the stream, move a dip net back and forth through the grass. Identify each organism using the identification chart.
4. Record species present and number of individuals per species. Only record aquatic invertebrates!
5. Calculate the Stream Index by counting the number of species in each tolerance group and weighting the number. (Each tolerant species is worth 1, each moderate species are worth 2 and each intolerant species are worth 3). Add these together and record this as the Stream Index. (number of individuals per species do not affect stream index)

## **What to Record**

- Date and Time
- Species Identified
- Number of Individuals per Species
- Stream Index
- The name of each participant and what they accomplished during the period
- Photo of at least one team member with a scientifically significant discovery & paste into SW book

# Large Biotics Station Materials & Methods

## **Materials:**

2 Dip Nets  
1 Seine Net  
Identification Books (*Freshwater Fishes & Guide to Southeastern States*)

## **Methods:**

1. Record the date and time in the data book.
2. Carefully search for any wildlife while walking down into the wetland area.
3. Use the seine net to catch any fish, tadpoles, turtles, and other vertebrates.
4. Use the dip nets to catch any vertebrates along the banks of the wetland.
5. Identify all organisms using the ID guides and record your results. Only record vertebrates!

## **What to Record**

- Date and Time
- Species Identified
- Number of Individuals per Species
- The name of each participant and what they accomplished during the period
- Photo of at least one team member with a scientifically significant discovery & paste into SW book

# Forest Transect Station Materials & Methods

## Materials:

Meter Tape  
Astrolabe or Clinometer  
Identification Book (*Common Forest Trees of North Carolina*)

## Methods:

1. Record the date and time in the data book.
2. Randomly select a forest location.
3. Spot the four closest trees in the four compass positions (North, South, East, West)
4. Identify each tree using the tree identification book.

### For Each of the Four Trees:

#### Tree Circumference

5. Wrap the meter tape around the trunk.
6. Record results in centimeters.

#### Tree Height

7. Use the astrolabe (or clinometer) to find a 45° angle from the ground.
8. Walk back slowly, not changing the angle, until you can see the top of the tree at a 45° angle.
9. Measure the distance from you to the base of the tree. Also measure the height of the measurer, subtracting any height above their eyes, and add to the distance measured.
10. Record height of the tree in meters.

## What to Record

- Date and Time
- 4x Tree Species
- 4x Tree Height (in m)
- 4x Tree Circumference (in cm)
- The name of each participant and what they accomplished during the period
- Photo of at least one team member with a scientifically significant discovery & paste into SW book

# Forest Quadrat Station Materials & Methods

## **Materials:**

Meter Square Quadrat

Metric Ruler

Small Shovel

Identification Books (*Guide to Southeastern States, Insects and Earth Colors*)

## **Methods:**

- 1) Record the date and time in the data book.
- 2) Once inside the forest, randomly choose a spot to put down the meter square.
- 3) Make observations about what is living inside the square. Record any shrubs, insects, leaves, detritus, etc.
- 4) Measure the depth of the leaf litter in centimeters.
- 5) Using a small shovel to dig into the soil and measure the depth of the topsoil in centimeters.
- 6) Describe the soil color and texture.

## **What to Record**

- Date and Time
- Leaf Litter Depth (in cm)
- Topsoil Depth (in cm)
- Soil Observations (color, texture, etc)
- Species of Organisms Observed (minimum of three)
- The name of each participant and what they accomplished during the period
- Photo of at least one team member with a scientifically significant discovery & paste into SW book