Get That Trash Out of Our Splash!

Grade: Special education
Place of Focus: Suburban streams and rivers
Participatory Science Protocol: Nitrate Watch, Salt Water Watch, Waterway Debris Tracker
Partner(s): Izaak Walton League of America and National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program

*****Disclaimer*****
This lesson plan was written specifically for students who are educated in substantially separate classrooms due to complex learning needs. It can also be used to scaffold lessons for students who receive their education in an inclusive setting. Although state standards can be targeted with this lesson, it was written more to target specific IEP goals and objectives. Although some examples of objectives that can be addressed with this lesson are listed, it is by no means an exhaustive list. I have intentionally written this lesson plan with asterisks in parts where adaptations and accommodations can easily be made in order to modify the lesson to meet the complex needs of the students. Although accurate data collection would be great, the focus should be on PROCESS NOT PRODUCT!

SMART Goals and Objectives Targeted

- 1 to 1 correspondence
- Accurate recording
- Following visual instructions
- Staying with a group
- Making judgements
- Safe street crossings
- Item ID, picture matching
- Cooperative work
- Career exploration
- Prepositions
- Distinguishing between natural material and litter
- Dirty vs clean
- Report findings
- Calendar skills

Learning Objectives

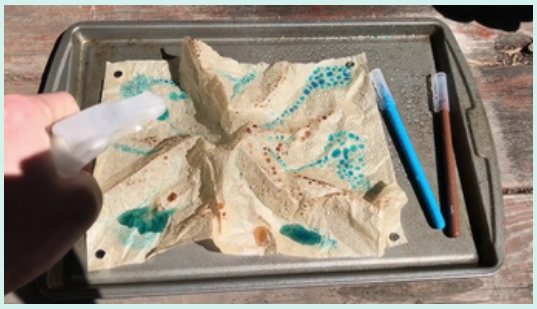
By the end of the field lesson, students will:

- Safely navigate to a familiar location within their community
- Identify what should and should not be on the ground
- Accurately identify and categorize found items from the community
- Count and accurately report how many items were collected
- Interpret and accurately report on measurements
- Record relevant information in a visual data collection form

Pre-Visit Learning

Prior to the site trip, students should understand:

- The difference between clean and dirty
- The difference between natural materials and litter/trash
- Basic prepositions
- How to use data collection materials
- Have students experiment with how water and debris flow down into the watershed with hands on models such as:



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Pre-Visit Learning

Prior to the site trip, students should understand:

- Discuss the difference between visibly dirty water and invisibly dirty water.
  - Use 3 clear cups of water. One has pure water, one has lemon or orange juice in it and one has salt dissolved in it. The students can note visually that the water with juice is dirty. They will need to test that the water with salt is "dirty". This can be done with litmus strips which will be used in the field. They can confirm the results by smelling or tasting a drop of each cup.
  - * Be very careful with allowing students to taste the water as they may take it as permission to taste water in the field. Only allow them to taste if you feel they can be safe and follow directions to only taste when given permission.

Essential Questions

How do pollutants end up in our waterways?
What happens when trash ends up in the waterways?
What can we do to help?

Field Visit Preparations

Time

These visits can take as long or as little time as the students can tolerate. For water collection, a minimum of 5 minutes should be allotted. Litter collection can happen en route to the waterway if walking, or as part of a walk once you have arrived and can be any duration.

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Field Visit Preparations

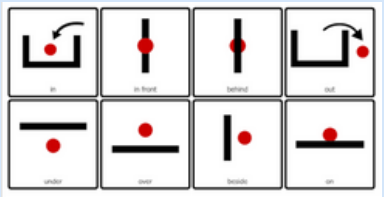
Time (cont.)

* Timing can be broken down further by separating litter collections and water collection. It is also possible to collect the litter while walking and categorize and track the litter at later times when the students are ready. Those instances can be broken down into smaller increments by choosing to do any targeted number of items.

Materials and Supplies

- Nitrile gloves
  - * If students are not able/willing to wear the gloves, hand washing protocols can be discussed and prepared for (bring soap and water). Students can also point to the litter and have staff members handle the items. If they can do so safely, they can also use a grabber tool or tongs to pick items up.
- A bucket on a rope
  - * The other end of the rope should be attached to a fence, railing, or staff member to lessen the likelihood of losing the bucket when the students attempt to collect water.
- A tightly sealing container to transport water back to school if not measuring in the field
- A sharps container that will be used if any broken glass is found (note, that only staff should touch or dispose of any sharp items)
- Test strips (from the Izaak Walton League of America)
- Visual supports (find attached later in the lesson)
- Tracking forms (with clipboard and writing implement) or marine debris tracking app



Logistics

- Be sure to use the restroom before leaving your school as there are no public restrooms available
- It is best to gather away from the road
- Check the weather before leaving
  - * We will reschedule the walk if the weather is not conducive to being outdoors. If your class does not have that flexibility, be sure to dress for the weather.

- We will be visiting the Cheese Cake Brook which is a .3 mile walk from our program.
  - The hills on either side of the brook can be steep in places, and for this reason, water collection will take place from a foot bridge that crosses over the brook.
  - * Water can be collected from any waterway near your school.
- In an emergency, NECP and Day Middle school are both near the Cheese Cake Brook and can be accessed as needed.
- * Staff to student ratios should be determined based on individual student needs. Take in account their likelihood to wander and elope as well as their ability to follow directions and stay with the group. If any unsafe behaviors are possible, consider 1:1 staffing ratios for those students who may struggle.

Scientific Protocol

- Nitrate Watch Kit from the Izaak Walton League of America
- Salt Watch Kit from the Izaak Walton League of America
- Marine Debris Tracker
- Students will be encouraged to follow visual and/or verbal instructions at their highest level of independence.
  - * Instructions can be reformatted to present one, two or more steps at a time. Visual clutter can also be reduced by covering steps that have not been reached until they are needed.

A PDF of visual supports can be found here.

Field Visit Outline

Introduction

- Expectations, safety, and video modeling will have been reviewed in advance of arrival at the site. When at the waterway, they will be reviewed again.
- Street safety will be discussed. How to cross streets and how to be aware of vehicles in the environment.
- The site will have been reviewed in advance by using google earth. While at the waterway, landmarks that were found in advance of the trip will be pointed out.
- Safety around water and review that students should not be in the water must be reviewed with all students and staff.
- Staff and students will all know who they are assigned to be with.
  - * In the event that staff need to be redistributed due to challenging behaviors, there will be contingency plans for who will absorb any students who need unexpected supervision. Ideally, the primary teacher will not be assigned to any students and can float as necessary to support student behavior, or take on students directly if support staff need to redistribute to help others.

Learning Tasks

* The activities will vary by student and their level of independence and need.

- The whole class will gather together to review safety, expectations, plans for the day, and to assign tasks.
- Students will begin by walking along the waterway and collecting as much litter as they can. * If they are able to track what they find in real time, that's great. If not, the litter can be brought back to school and categorized and counted as time allows.
- A group of 1-3 students will use the bucket to collect water.
- Those students can then follow the strip testing protocol and judge the color as it compares to the provided chart. * If the students are not able to test the water while at the waterway, the water can be placed in a tightly sealing container and brought back to school for later testing.
- If more students would like to collect and test water, another group can take and judge a second sample.
- At the end of the outing, all litter should be brought back to the school. If it has already been tracked, it can be disposed. If it has not yet been tracked, it can be reviewed back in class as time allows, and then disposed.
- * It is important to ensure that the timing and expectations match the student's levels of arousal and attention to task. It is better to work for less time, but to have the session end on a good note, than to push for longer in the field. This project can and should take place monthly so there will be opportunities to work towards longer amounts of time on task.

Reflections

- Staff will support students in sharing with each other what they found during the outing. They can use the visual supports to demonstrate what they have found.
- After each visit to the waterway, students should judge how clean or dirty it was upon arrival and when they left.
- If able to, students will record and send in the results of their nitrate and salt measurements to the Izaak Walton League. * If unable to participate directly, they can observe as the teacher records and send in the information.
- All materials that were brought with us will be collected and brought back to school.
- All litter should be brought back to the school.

Post-Visit Learning

- The intention of this project is that the students will go once a month to complete this activity.
- The teacher will support them in tracking their judgements and measurements over time.
- When possible, we will review the reports that will be published by the Izaak Walton League.
- For future site visits, students will be given the opportunity to self advocate for which tasks they would like to complete.
- The students may set personal litter collection goals and may attempt to "beat their best" by collecting more pieces than they previously collected.
- Students will be encouraged to create signs discouraging litter.
    - * If any students are motivated to "teach" younger children. They will be encouraged to present a mini presentation to the preschool that abuts the Cheese Cake Brook about litter and how to keep the waterway clean.

Full Unit Outline

Students will learn the difference between clean and dirty and practice community safety and engagement by completing litter walks as well as taking and analyzing water samples.

- Students will visit monthly over the course of a year.
- They will:
    - Pick up litter
    - Track the litter collected, report it with the marine debris tracker
    - Test the nitrate levels of the water
    - Test the salinity levels of the water
    - Report their water tracking results to the Izaak Walton League
- Students will practice and improve their skills over time and demonstrate more agency in their choices and participation in the project.
- Students will review and compare their experiences and findings from month to month.