# **Storm Drains**

In this lesson students will go out into the field to investigate the storm drains in their community. They will build an understanding of the connection that storm drains have in the spread of pollution and debris such as nurdles. Students will then be given the opportunity to come up with ideas or solutions to the problem.

# Audience: 2-3

# Student Outcomes:

- Students will understand how storm drains are connected to water systems and can become a source of debris such as nurdles.
- Students will be able to identify storm drains around their school and community.
- Students will be able to explain the environmental challenges associated with storm drains and pollution.
- Students will use this information to devise a creative solution to this environmental challenge.
- Students will be able to propose a task or solution and explain the problem that storm drains and pollution have.

#### Teacher background: Nurdles:

Nurdle Patrol - Home The Great Nurdle Hunt- problem with nurdles Nurdle Fact Sheet

**Storm Drains:** In some old cities, the sewage system and the storm drain system are connected and together are called a combined sewer system. During heavy rains, the old systems are overwhelmed and usually both the storm water and sewage do not receive adequate treatment and are discharged into a local waterway.

Other cities have a sewer system made up of two different networks of pipes. One network handles sewage coming from sources such as kitchen sinks, toilets, and washing machines. These pipes carry waste materials to a larger network of pipes leading to a sewage treatment plant where sewage is separated into sludge (solid waste material) and water. The Sludge is compacted then landfilled, incinerated, or marketed as an environmentally beneficial product, while the water is discharged into a river or other nearby waterway free of any solid waste.

The other network of street gutters and pipes carry runoff storm water from streets to nearby bodies of water such as streams, rivers, and oceans. There is generally no screening process associated with this system, so litter that is carried into the pipes with storm water will also end up in the receiving body of water. These pipes are obviously designed to carry storm water runoff from one point to another and are not meant to





transport street litter and other types of debris. Storm drains, then, are a source of water pollution to the extent that people use them as receptacles for inappropriate waste. Taken from the <u>Storm Drain Connection</u>

#### Materials:

- Book: All the Way to the Ocean or Online: All the Way to the Ocean
- Student Journals if they have one
- Pencils

#### **Teacher Prep:**

Be sure to assess your location before taking your class on a walk outside. This way you know what areas need to be passed in order to find the storm drains around your location.

#### Introduction:

Students will start by watching or listening to the following story <u>All the Way to the</u> <u>Ocean.</u>

#### Procedure:

- 1. After reading or viewing "All the Way to the Ocean", pull out your vial of nurdles from your teacher kit. Pass it around and let the kids see the nurdles.
- 2. Show the students this quick clip on what a nurdle is <u>Hurdles with Nurdles</u> -YouTube 0:28 to 1:00. Discuss with the students how a nurdle is the same as a water bottle, plastic bag etc. They are the basis for everything plastic. Tell the students that as you are going on your outdoor investigation to think about what would happen if a giant truck carrying nurdles had a spill or if a train carrying nurdles had them fall out of one of the railcars.
- 3. The teacher will take the students on an outdoor investigation/field trip around the school grounds in search of storm drains. If students have Science journals that they use in the classroom, have them bring them along to record their observations.
- 4. While you are outside students will be looking for and identifying storm drains. They will also look to see if there is any trash near or in the storm drain. Ask questions to get the kids to start drawing conclusions about what they are observing. Some questions you might ask are: What do you think will happen to the trash on the ground? What about when it rains? Or strong winds?
- 5. Remind the students to be thinking about the question that was asked before they went outside to begin the investigation. What would happen if a truck carrying a bunch of Nurdles accidentally spilt the Nurdles all over the street? What types of problems would this create?
- 6. After locating the storm drains and observing, recording, and discussing the area surrounding the storm drain, students head back to the classroom.





## **Questions/Discussion:**

Once you have returned, invite students to share what problems they thought might arise if an accidental spill of Nurdles occurred on the street. Give students a chance to share out, then ask them to brainstorm different solutions they might have for this problem.

#### Extensions:

# **STEM Extension- Engineering**

Think about the effects pollution and storm drains combined have. What invention would you create that would help this problem? Would it be something that helps the transport of Nurdles? Would it be something that assists with the storm drains?

## Art/ Social Studies

- 1. Students will diagram the path of trash/debris (Nurdles) from the street into the storm drain and eventually into a body of water. Encourage students to think of the community that they live in. Have them include a picture of their home, storm drain, and the final destination of where that trash/debris wound up. Students should include labels in their drawing.
- 2. Another option would be to have the students create a poster to inform others about storm drains and the effects they can have on communities and environments.

#### **Social Studies**

The students should be able to identify examples of actions groups can take to improve their community. In this extension, allow students to be a part of an action to improve their community. Contact your local storm water facility and find out the guidelines and procedures for creating awareness of storm drains through artwork. Check out this short news clip about the artwork being done around storm drains. <u>Artwork Brings Awareness For Stormwater and Storm Drains in Superior</u>

# Suggested Read aloud books

The Mess That We Made

# Additional Resources

NOAA Ocean Service: Nurdle Patrol <u>I Joined Nurdle Patrol</u> <u>Mission Aransas Nurdle Patrol Student Project</u> <u>4Ocean</u>

Adapted from "The Storm Drain Connection" developed by The Center for Marine Conservation and the California Coastal Commission in the Save Our Seas curriculum guide.



