Nurdle Patrol Special Agent Training Course - Facilitator's Guide

Use this guide to help you facilitate the 8-part audio course from Tumble Science Podcast for Kids

Table of Contents

What is this and how am I supposed to use it?

The Nurdle Patrol Audio Course is an eight-part educational series from Tumble Science Podcast for Kids, designed to engage students in grades 3–5 in a real-world citizen science mission. Guided by lead agent Marshall and scientist Jace Tunnell, participants learn to identify and collect nurdles—tiny plastic pellets polluting waterways—and contribute their findings to a global database. Each lesson combines storytelling with hands-on activities, aligning with NGSS standards to foster environmental awareness and scientific inquiry. Facilitators can use this course to inspire young learners to take actionable steps in combating plastic pollution.

Each lesson includes additional downloadable / printable resources that you can share with your students to complete either while listening or after listening.

This course includes two “Nurdle Surveys” that are intended to occur in a location out in students’ communities on two separate class days, in places where plastic trash is likely to accumulate–mostly near waterways, but also along freight tracks, storm drains, and other places where trash picked up by wind and rain might travel. Though part of the course is for students to select a good location for a survey, you can plan ahead by doing some research of easily accessible places a short walk away from your classroom.

Standards, Scope, and Pacing						
Lesson #	**Lesson Title**	**Description**	**Audio Lesson Length**	**Total Lesson Time**	**Standard**	**Standard Code**
1	Episode 1: Welcome, Nurdle Patrol Recruits!	Students will learn about nurdles and the plastic manufacturing process, and identify plastics in their own school community.	5min43sec	20-30 mins	NGSS	5-ESS3-1, 4-ESS3-1
					ISTE	1.3d
					CCSS ELA	CCSS.ELA-Literacy.RI.3.7, 4.7, 5.7
2	Episode 2: Identifying Nurdles (Survey Part 1)	Students will learn how to identify nurdles by size, shape, color, and texture.	7min50sec	15-20 mins	NGSS	5-PS1-3
					ISTE	1.3d
					CCSS ELA	CCSS.ELA-Literacy.RI.3.7, 4.7, 5.7
3	Episode 3: What Happens When Nurdles Spill?	Students will learn the impact that nurdle spills have on the	4min15sec	15-20 mins	NGSS	3-ESS3-1, 5-ESS3-1,

		environment, and complete a pre-nurdle survey activity.				4-ESS3-1
					ISTE	1.3d
					CCSS ELA	CCSS.ELA-Literacy.RI.3.7, 4.7, 5.7
4	Episode 4: Choose Your Location (Survey Part 2)	Students will learn how to choose a good location for a nurdle survey, and then choose their location.	5min18sec	15-30 mins		
					NGSS	5-ESS3-1, 3-ESS3-1
					ISTE	1.3d
					CCSS ELA	CCSS.ELA-Literacy.RI.3.7, 4.7, 5.7
5	Episode 5: Nurdle Hunt! (Survey Part 3)	Students will go to their survey site and complete their first nurdle survey.	16min35sec	30mins-2 hrs (depending on travel time)		
					NGSS	5-ESS3-1, 3-ESS3-1
					ISTE	1.3d
					CCSS ELA	CCSS.ELA-Literacy.RI.3.7, 4.7, 5.7
6	Episode 6: Return to the Scene of the Crime!	Students will return to their survey site and complete their second nurdle survey. Then, students will	13min27sec	30 mins - 2 hrs (depending on travel time)		
					NGSS	5-PS1-3, 5-ESS3-1, 4-ESS3-1
					ISTE	1.3d

		look at data from both surveys.			CCSS ELA	CCSS.ELA-Literacy.RI.3.7, 4.7, 5.7
7	Episode 7: How to Share Your Data with the World!	Students will enter their information on nurdlepatrol.org as a nurdle report.	5mins29sec	15-30 mins		
					NGSS	3-ESS3-1, 5-ESS3-1, 4-ESS3-1
					ISTE	1.2b, 1.3d
					CCSS ELA	CCSS.ELA-Literacy.RI.3.7, 4.7, 5.7
8	Episode 8: Nurdle Patrol Graduation	Students receive their diplomas and get promoted to special agent! Students also create a classroom rule re: plastic.	5mins9sec	15-30 mins		
					NGSS	5-ESS3-1, 3-ESS3-1
					ISTE	1.3d
					CCSS ELA	

Pacing Guide

It is recommended that you complete one lesson per class day–though it's not required that lessons occur on consecutive days. One lesson per week would be just fine. If necessary, though, it's entirely possible for multiple lessons to be completed in a given class day. See below for some different pacing guides.

Lesson 6 is a second nurdle survey–an opportunity for students to return to a second location on a separate day and see if conditions have changed. It could be skipped if time is short.

Class Days	**Recommended**	**Faster**	**Fastest**
1	Lesson 1	Lessons 1 & 2	Lessons 1 - 4
2	Lesson 2	Lessons 3 & 4	Lesson 5
3	Lesson 3	Lesson 5	Lessons 7 & 8
4	Lesson 4	Lesson 6	
5	Lesson 5	Lessons 7 & 8	
6	Lesson 6		
7	Lesson 7		
8	Lesson 8		

Supplies

- Access to the Nurdle Patrol Audio Course episodes (streaming or downloaded)
- Internet-connected device (computer/tablet/smartphone) with speakers or headphones
- Printouts from the audio course resource list
- Clipboards or notebooks (enough for each student to have one)
- A GPS-enabled device or access to Google or Apple Maps
- A timer (the audio course has a built-in timer but you may wish to have one for reinforcement)
- Gloves (one per student)
- Collection containers to store nurdles you find

Lesson Guidelines

Lesson 1 -

Lesson 1 is an introduction to the plastic manufacturing process and contains several worksheets to help students understand how plastic is manufactured, where it comes from, and how they can start to think about how much plastic they interact with on a daily basis. There is an optional Nurdle Hurdle Race that you can do with students. There are student-facing instructions for the Nurdle Hurdle Race included in the resources for the audio course. Teacher-facing instructions are at this link, but have also been copied and pasted to the end of this document.

Lesson 2 -

In this lesson, students will be practicing spotting nurdles by looking at photos taken of nurdles in nature. These photos are included as downloadable resources along with the audio course, but if you'd like to supplement them with *real live nurdles*, you can order a nurdle patrol kit direct from the nurdle patrol website. That way students can interact with the nurdles in real life.

Lesson 3 -

In this lesson students are learning about what happens when nurdles spill, and how they spill. There are downloadable resources to help them included with this lesson.

Lesson 4 -

In this lesson students are going to learn about the kinds of places that nurdles accumulate–usually near bodies of water–and use that information to work together to choose a location for their own nurdle survey. If the students don't have an accessible body of water nearby, don't despair: guide the students to think about the other things they've heard about what kinds of places nurdles might spill. These could be freight tracks, storm drains, near highways, or anywhere that trash and other debris tend to collect. Guide the students to work together to agree on a site that is both feasible given their transportation constraints, but also likely to have some spilled plastic trash.

Lesson 5 -

Prior to starting this lesson, be prepared to travel to the site you selected in lesson 4. You should listen to the audio either on the way to the site or once you arrive there, so be prepared to depart before you begin listening.

Lesson 6 -

This is a second nurdle survey conducted at the same location. The point of repeating this survey is to get students to think about how weather conditions or other changing conditions might impact what they find at a location, and also to practice completing a survey.

Lesson 7 -

In this lesson, students will be submitting their data to nurdle patrol's website, and using the map to explore what the data might tell them about where nurdles are found in their neighborhood. If there haven't been many surveys near you, zoom out to look at broader trends. Clear patterns emerge about where nurdles tend to wash up, and you can guide students to think about what might be causing those patterns. The gulf coast of Texas, for example, has a great deal more nurdles found in it than the east coast of Florida–why might that be? (Hint: it has something to do with powerful ocean currents that push debris towards Texas and away from Florida). Help students think about these patterns and how they might connect to other things they can observe.

Lesson 8 -

In this final lesson, students "graduate" from the Nurdle Patrol training course and begin thinking about how this data might impact the rules we can make to govern our world. They can follow their graduation with a discussion about rule-making in their own classroom. Are there any rules they can make for themselves that might help reduce the number of nurdles they'll find out in the environment?

Nurdle Hurdle Race

This game is designed to give the students a visual representation of what occurs when nurdles are shipped from facility to facility and around the world. It is meant to get a little messy. Students are going to spill rice. It would probably be best to play this game in an outdoor setting or on a non-carpeted surface indoors.

Materials

- Spoons – enough for each team
- Large bag of rice
- Large container to pour rice into for initial station
- Tables for station stops
- Bottles to collect the rice during the game. We used water bottles, but the idea is to have a bottle with a smaller opening than the spoon. (We want a little bit of rice to spill)
- Solid surface – Students will run. We also want the students to see how much rice was spilled. (outdoor basketball court or concreted area with little to no grass)

Teacher background

During transportation of nurdles is when large spills occur. During this game students will see how easy it is to spill nurdles and how hard it is to contain and reclaim the nurdles after a spill. The three major ways of transportation are train, ocean liner, and 18-wheeler.

https://www.nurdlehunt.org.uk/the-problem.html - Great article for additional information and infographs.

Teacher Prep:

This game is messy and rice will be spilled. Use an area that can easily be cleaned or outdoor space where spilled rice and be seen on the ground. Set up your tables for the game. Diagram below of example. The orientation can be changed to accommodate space, limitation or other factors. The idea is to have varying lengths that students will have to travel. Separate students into teams – As even as possible. 3 or more students per team.

Procedure:

Before Game – Here are some questions to get the conversation going. This will get the students thinking about transportation of plastics, the problem of single-use plastics and brainstorm ways to reduce plastic use.

1. How do you think plastic is transported around the world? How would we get raw material from California to Mississippi? What about from China to Texas?

2. What are some ways to reduce the amount of plastic use?

3. How can we help reduce the amount of plastics we use in everyday life?

Set-up:

In large area set up 4 tables with enough room in between for students to run back and forth. One table will be the START station with a large container filled with rice. (Shoebox size or larger is best) On the other THREE tables, place empty containers, one per team. These containers need to have an opening smaller than the spoon, like a plastic drinking bottle. For example, if you split students into three teams, three containers need to be on each of the tables.

In each team of students, assign which mode of transportation they represent; train, 18-wheeler and cargo ship. Each student will then ONLY travel to the designated table for the mode of transportation they represent. Explain to students that this will be a competition to see which team can fill their container the quickest. DO NOT let on that spilling is part of the game. Let that part naturally happen. We want the students to focus on filling the containers and not worry about the spilling.

HINT The competition can be played two ways. You can either set a time limit on how fast they can fill the containers. At the end of the time, the team with the largest amount filled wins. OR The first team to fill all the containers wins. With this method, mark on the bottle a fill line.

Start Game:

Each team will line up around the first table

The Student 1 on each team will grab a spoon.

When teacher says go, Student 1 will fill their spoon with as much rice as possible and heads to the transportation table assigned. Fills the team container and heads back. Student 1 hands the spoon to Student 2. Student 2 fills the spoon and heads to designated transportation table and fills team container, then heads back and passes to Student 3 and so forth.

HINT Rice that spills on the floor creates a slippery situation. As the game plays, please make sure to watch the amount that is spilled. If too much, clean the play area. Also, it might be a teachable moment if a student stumbles or runs into another student and spills all the rice. Student safety first. Students play until the containers are filled or time runs out. The fastest team WINS!! But does anyone win???

Once game play is over. Start the conversation with students about the game.

Example Questions:

1. Was pouring rice into the container easy? Did you spill some rice?

2. What was more important during the game? Filling the container slowly with no spill or being the fastest to get back?

3. In the real world, nurdles are transported by these three vehicles. After playing this game, what are some ways the plastic industry could help prevent spills?