

Currents & Pollution Spread

Audience: Middle School

Description

Ocean currents play a major role in how pollution moves through marine environments. In this activity, students will simulate ocean currents and observe how they influence the spread of pollution, including plastic nurdles.

Student Outcomes

- Students will demonstrate how ocean currents move.
- Students will observe and explain how currents affect the spread of pollution.

Materials

- Clear shallow container (at least 2 inches deep)
- Water
- 2 medium rocks (about hand-sized)
- Food coloring: blue, red, yellow, green
- 1 large ice cube (or several small ones)
- 4 nurdles
- Student handout
- Colored pencils

Teacher Background

- Hurdles with Nurdles (video clip)
- The Great Nurdle Hunt (overview of the nurdle problem)
- Nurdle Fact Sheet (reference material)

Teacher Prep

- Set up one container per group with about 1 inch of water and 2 rocks placed so that parts of each stick above the surface (to represent continents).
- Keep ice cubes nearby in a cooler or fridge so they don't melt before use.
- Prepare enough stations for groups of no more than 5 students.

Alternative: You can model this as a teacher-led demonstration projected on a screen, but hands-on group participation is highly recommended.

Introduction

1. Begin with the video Alien Deep: Ocean Conveyor Belt (National Geographic) to review how ocean currents work.
2. Introduce nurdles with the clip Hurdles with Nurdles (play from 0:27 to 8:31).
3. Pass around vials of nurdles for students to examine. Explain that some nurdles float and some sink, depending on density. Most nurdles collected on beaches are the floating type—like the ones used in this activity.

Procedures

1. Explain that students will investigate how ocean currents affect the spread of pollution, including nurdles.
2. Divide students into groups and assign each to a prepared station.
3. Each group adds one large ice cube (or several small ones) to their container.
4. Students carefully add drops of food coloring to simulate pollution:
 - 4 drops of blue between the rocks
 - 8 drops of yellow in the top right corner
 - 4 drops of green in the top middle section
 - 4 drops of red to the right side of the right-hand rock
 - Place 4 nurdles anywhere in the tray (*Refer students to the diagram on their handout for placement.*)
5. Students record on their diagram where the nurdles are placed at the start.
 - a. Remind students not to touch, bump, or blow on the container, as even small disturbances can affect results.
6. After 8 minutes, students record where the pollution and nurdles have moved. They should use colored pencils to shade the spread and update their diagrams.

Discussion

- What kinds of pollution might the different colors represent?
- How did the “continents” (rocks) change the way currents moved pollution and nurdles?
- Which color of pollution spread the farthest? Why do you think that happened?
- Did the nurdles move with the currents? How far did they travel?
- What do you think happens to nurdles that sink (higher density plastics)?
- Did you notice a difference between movement at the surface and the bottom of the container? Why might that occur?

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Student Worksheet

In this investigation, you will observe how ocean currents affect the movement of pollution, including plastic nurdles. Follow your teacher's instructions and record your observations below

Step 1: Starting Positions

Diagram below shows the container with continents (rocks). Add pollution colors and nurdles where instructed.

Top of container



Step 2: After 8 minutes

Now show where the pollution colors and nurdles moved after 8 minutes

Top of container

