Live investigation: Sampling for plastics

Age 7-14

45 minutes

Prep resources

Lesson
Arctic live preparation lesson

Unit
Frozen Oceans Science / Geography

PD Collection
Live lesson support

Encounter Live support

If you have never joined a live lesson before use the guidance at https://encounteredu.com/cpd/collections/live-lessons, where you will find technical and educational support.

Live resources

Encounter Live
Live lesson homepage

Student Sheet
Microplastic sampling

Student Sheet
Microplastic sampling (advanced)

Safety and Guidance

Precautions

Care must be taken to avoid cuts and bruises whilst using an apple corer. Ensure students work slowly and delicately, as an Arctic scientist would.

Preparation

Live lessons work best when students have some prior knowledge and have prepared questions. Either teach a lesson from one of the Frozen Oceans units at https://encounteredu.com/teacher-resources/topics/polar or choose a one-off Arctic Live Preparation lesson, available to download on each live lesson web-page.

Check that you can view live chats by testing any YouTube Live video. Ensure you have the correct materials for the Live Lesson.

You will need to create trays of ice with simulated 'microplastics' to represent a 'region of the Arctic'. Your students will be challenged to sample and quantify amount of 'microplastics' in that 'region of the Arctic'. To make these 'regions of the Arctic', freeze a known amount of lentils or rice in brine water (at least 32g salt per litre of water) in flat containers, such as baking/roasting trays.

Fill the trays to about 2cm in height and consider distributing the 'microplastics' unevenly through the tray to make accurate sampling more of a challenge for your students. Don't forget to record the amount of 'microplastics' (either number of pieces or grams) that you used in each tray, which can be the same or different for each group again to challenge your students.

Learning objectives

- Describe how plastic gets into the environment
- Replicate the sampling strategy of polar scientists
- Estimate a population from a sample

Session steps

1. **Introduction (5 mins)**
   The presenter will open the session with a welcome and brief introduction to the expedition and any shout-outs to registered classes. During this time students to get into their allocated groups and set up their experiments.
2. **Subject knowledge (10 mins)**
   The presenter will then proceed to speak about the emergence of microplastics in the environment and the importance of working scientifically to better understand where these microplastics are and what impact they may have on whole ecosystems.
3. **Activity (15 mins)**
   Students will be challenged to design their sampling strategy and think of ways to separate microplastics from ice samples, which can be thought of as impure mixtures. The presenter will demonstrate a method to separate the 'microplastics' from the ice and how they will record their findings using a data table.
4. **Q&A (15 mins)**
   After completing the activity, the presenter will be able to answer pre-submitted questions and take part in the live chat.