SCHEME OF WORK

Lesson 1: How are plastics made?

Overview

In this chemistry Key Stage 3 (KS3) lesson, students will learn how monomers and polymers dictate the properties of plastics. This lesson focuses on how plastics are made. Included are teacher resources for students to make their own polymer, using PVA and borax, to observe how changing the structure of a substance changes its properties.

Learning outcomes

- State that plastics are made from oil
- Describe the steps involved in making oil
- State what a monomer and a polymer is
- Describe how changing a substance's structure can change its properties

Resources

Slideshow 1:
How are plastics made?

Activity Overview 1a:
How to make slime

Student Sheet 1a:
Plastic production table

Student Sheet 1b:
Plastic card sort

Student Sheet 1c:
How to make slime

Thinglink:
Seven types of plastic

Lesson 2: Why are plastics useful?

Overview

In this chemistry Key Stage 3 (KS3) lesson, students investigate the different properties of plastics. In groups students design an investigation testing either thermal insulation or tensile strength. Included are teacher resources with an investigation template.

Learning outcomes

- Describe how plastics can be both harmful **(including impacts on climate crisis and marine ecosystems)** and useful
- Identify independent, dependent, and control variables
- Develop investigation skills including control variables and repeats
- Evaluate results in a graph

Resources

Slideshow 2:
Why are plastics useful?

Activity Overview 2a:
Plastics independent investigations

Student Sheet 2a:
Plastics independent investigations

Lesson 3: What happens after you throw it away?

Overview

In this chemistry Key Stage 3 (KS3) lesson, students investigate rates of decay. The lesson is focused on students designing their own investigation. Included are teacher resources allowing students to test how a conventional plastic bag decays compared to a compostable bag (using a potato as a substitute), in different conditions.

Learning outcomes

- Recognise that most plastic ends up in either landfill o the sea.
- Order materials based on the time they take to degrade.
- Describe alternatives to using plastics
- Create an investigation on how to increase the speed of decay.

Resources

Slideshow 3:
What happens to plastic when you throw it away

Activity Overview 3a:
Degradation test

Student Sheet 3a:
How long will it take to degrade?

Student Sheet 3b:
Biodegradable plastic bags academic paper

Student Sheet 3c:
Design a biodegrade test

Student Sheet 3d:
Dr Imogen Napper's study

External Link:
Inspiring Stories: Imogen Napper

Lesson 4: How does plastic affect the environment?

Overview

In this biology Key Stage 3 (KS3) lesson, students learn how plastics affect the marine environment. This lesson is focuses on the physical harm caused by plastics to marine organisms. Included are teacher resources that promote students to become advocates for reducing plastic waste to protect our oceans.

Learning outcomes

- Order most common types of plastic waste
- Describe how plastic waste impacts the environment
- Predict how plastic waste impacts a variety of marine organisms
- Formulate solutions to plastic waste issues

Resources

Slideshow 4:
How does plastic affect the environment?

Student Sheet 4a:
Sources of marine plastic

Student Sheet 4b:
Plastics in the ocean

Student Sheet 4c:
Marine life cards

External Link:
Sea turtle with a straw up its nostril

Lesson 5: Plastics and bioaccumulation

Overview

In this biology Key Stage 3 (KS3) lesson, students will learn about plastics and bioaccumulation. This lesson is focused on how chemical pollutants cause harm to marine organisms. Included are teacher resources to model bioaccumulation and an orca case study.

Learning outcomes

- State that pollutants can enter an organism's body from the environment
- Describe how energy and pollutants are passed through a food chain / web
- Evaluate whether plastics contribute to bioaccumulation
- Analyse data to identify trends

Resources

Slideshow 5:
Plastics and bioaccumulation

Mark Scheme 5a:
Plastics and bioaccumulation assessment

Student Sheet 5a:
Plastics and bioaccumulation assessment

Subject Update:
How to: improve students online research skills