

Date	Class Level Fifth and Sixth Class	Subject Science
Strand Materials	Strand Unit Properties and Characteristics of Materials	
Title Introduction to degradation and how long it takes for materials to break down.		
Objective(s) Learn about the degradation of items typically found on the seashore. This activity can be done in class before visiting the seashore and carrying out a beach clean (lesson plan on how to organise a beach clean on www.explorers.ie).		
Skills Required Students will develop their investigation skills through: questioning, analysing, recording and communicating and evaluating how the different items are grouped differently and how they degrade in different ways.		
Learning Objectives The child will be enabled to:	Learning Activities	
<ul style="list-style-type: none"> group materials according to their properties and/or composition recognise that some materials decay naturally while others survive a long time in the environment 	<p>KWL chart: Begin the lesson using a KWL chart, where students can track information before and after the lesson. Ask students leading questions such as Can you name different types of materials? Can they think of ways things degrade or break down? What materials do they think take the longest to break down?</p> <p>Talk and Discussion: Begin the lesson by showing your students the PowerPoint presentation on Degradation.</p> <p>Ask them to discuss the types of degradation and to consider the types of materials that are found on the seashore. Ask them to sort the materials provided in the slideshow and to brainstorm a few more to add to the natural and processed boxes.</p> <p>Explain how all materials are subject to degradation. However, the process can take minutes, hours, days, years and centuries for different types of materials to breakdown. The different rates of degradation depend on the chemical compounds and the natural environment factors such as light, water, oxygen and temperature.</p>	

Using the list of items typically found on the seashore get the children (in teams) to guess how long they think the items will take to degrade.

Ask the students why they think some items degrade faster than other items. For example, why would an apple decay faster than a plastic bag? What type of materials would typically be found in the items that take a long time to degrade - e.g. what is plastic made up of?

Activities:

Show the students the “Can you guess how long the item will take to break down” slide from the Degradation slideshow and ask them to match the material with the correct length of time. This can be done as a class activity at the board, in small groups or individually by students.

You may also want to test your students using other materials found on the degradation information sheet.

Provide students with the correct answers and ask them to examine how many they got correct.

Ask students to re-write the materials in a list based on the length of time they take to degrade, from shortest to longest.

Finally discuss with the students the materials that are natural, not processed. Ask them to circle the natural materials in their list. Are these the materials that take the shortest lengths of time to break down, at the top of the list?

After the activities are completed (back in the class), the students should complete their KWL charts and highlight their experiences.

	<p>Resources</p> <ul style="list-style-type: none"> • KWL chart • Degradation information sheet (end of this lesson plan) • Explorers Degradation Power point Presentation • Samples of man-made and natural “clean” rubbish/ materials. <p>Websites for further exploration</p> <ul style="list-style-type: none"> • Images on Degradation: search for images using the phrase “How long does it take to degrade” • “Ocean Today” produced by NOAA in America. This site has a selection of videos in the section on “Fix our Ocean”. • “Two minutes on Oceans with Tim Toomey” produced by the United Nations Education Programme. • Search “Marlisco marine litter video” on Vimeo for an excellent animation on the marine litter and its impact on the environment. • For information on Micro beads (which are tiny pieces of plastic that are added to products such as shampoo and toothpaste) search for : <ul style="list-style-type: none"> • Clean coasts Beat the Microbead Ireland • Beat the Microbead International • Lets Ban the Bead- the Story of Stuff
<p>Differentiation Higher and Lower order questioning. Differentiate group activities and roles to account of individual needs, by support, task. Mixed ability pairing.</p>	
<p>Assessment Students: KWL chart (What I know, What I want to know, What I learned) Teacher observation and questioning: Mind Mapping Examine learning outcomes before and after e.g. knowledge, understanding, and skills. Evaluation: Reflect on learning experiences that lead to the outcomes e.g. attitudes, enjoyment, as well as motivation to learn about the subject.</p>	
<p>Linkage and Integration Geography – Environmental awareness and care – Organising a Beach Clean. Maths – Data – recognising and interpreting data, representing and interpreting data. Art – Construction – making constructions, looking and responding.</p>	

DEGRADATION - INFORMATION SHEET

Degradation is when items (including natural items and manufactured or processed products) decompose or breakdown very slowly into very small parts. The following chart shows how long it takes for some items (typically found on the seashore) to degrade.

Items typically found on the beach	Approximate time for compounds to degrade in a marine environment
Paper towels	2-4 weeks
Newspaper	6 weeks
Corrugated box	2 months
Apple	1-2 months
Banana peel	2-5 weeks
Cotton Cloth	5 months
Cigarette butt	1-5 years
Plywood (e.g. for building)	1-3 years
Waxed carton (e.g. milk cartons)	5 years
Plastic bags	10-20 years
Nylon fabric (e.g. clothing)	30-40 years
Leather	50 years
Rubber	50-80 years
Tin cans (e.g. tinned food)	50-100 years
Aluminium cans (e.g. drink cans)	150 -200 years
Soft plastic (e.g. drink bottles)	100 years
Hard plastic (e.g. bottle caps / lids)	400 years
Disposable nappy	450 years
Monofilament Fishing Line	600 years
Glass	Thousands of years
Styrofoam	While many things eventually break down after a number of years, Styrofoam is one of the few things that does not degrade.
Tinfoil	Tinfoil also does not degrade