



## TERM 1

**LESSON PLAN 5**  
**PHYSICAL SCIENCES**  
**CHEMISTRY GRADE 12**

KNOWLEDGE AREA	MATTER AND MATERIALS	TOTAL TIME: 19 DAYS
Term	1	
Unit 2	Plastics and fibres	
Date	/ /20__	
Resource	Doc Scientia Textbook and Workbook Physical Sciences Grade 12 Chemistry Book 2 P. 147 – 200	
Time	3 days	
Core knowledge	<p><b>Plastics and polymers</b>            (ONLY BASIC POLYMERISATION as application for organic chemistry)</p> <ul style="list-style-type: none"> <li>Describe the term polymer; macromolecule, chain, monomer, functional groups.</li> <li>Illustrate the reaction to produce a polymer by an addition reaction using the polymerisation of ONLY ethene to produce polythene,  <math>n\text{CH}_2=\text{CH}_2 \rightarrow (-\text{CH}_2-\text{CH}_2-)_n</math></li> <li>What is the industrial use of polythene? (Make squeeze bottles, plastic bags, films, toys and molded objects, electric insulation. Polythene has the recycling number 4.)</li> <li>Illustrate the reaction to produce a polymer by condensation reaction with the reaction to produce a polyester. Use ONLY the reaction to make the polymer polyethylene.</li> <li>Illustrate the reaction to produce a polymer by condensation reaction with the reaction to produce a polyester. Polylactic acid (PLA) is an interesting polymer, because the monomer used for this polymer comes from the biological fermentation of plant materials (as opposed to monomers coming from petroleum) and the polymer is biodegradable. This polymer (PLA) is mostly used for packaging material and, because it is biodegradable, it has the potential to alleviate land-fill disposal problems.</li> </ul> $n \left[ \begin{array}{c} \text{O} \quad \quad \text{O} \\ \parallel \quad \quad \parallel \\ \text{C} - \text{R} - \text{C} \\   \quad \quad   \\ \text{O}-\text{H} \quad \text{H}-\text{OH} \end{array} \right] + n(\text{HOCH}_2\text{CH}_2\text{OH}) \rightarrow \left[ \begin{array}{c} \text{O} \quad \quad \text{O} \\ \parallel \quad \quad \parallel \\ \text{C} - \text{R} - \text{COCH}_2\text{CH}_2\text{O} \end{array} \right]_n + 2\text{H}_2\text{O}$ <ul style="list-style-type: none"> <li>Identify the monomer used to produce a polymer from the structural formula of a section of a chain. Use only the following polymers to identify monomers: Polyvinyl chloride (PVC); polystyrene; polythene, and polyvinyl acetate (PVA). (Limited to identification of monomers.)</li> </ul>	



<b>Core knowledge</b>	Identify a polymer as the product of an addition or condensation polymerisation reaction, from its structural formula (use only polythene and polylactic acid).  <b>Guidelines for teachers</b> Make learners aware of materials made from polymers.  What do you know about Kevlar and Mylar? What are the functions of these materials and what are they used for? Who discovered or invented these materials?  Investigate what some windscreens are made of? What are break pads made of?  Discuss the different polymers that are used instead of glass.  Another example is the following: Illustrate the reaction to produce a polymer by condensation reaction with the reaction to produce a polyester.		
	<b>Practical activities/ experiments</b> Experiment 5 P. 152 – 154 Activity 2 P. 157 – 158 Activity 3 P. 158 – 159 Experiment 6 P. 163 Experiment 7 P. 164 – 165 Experiment 8 P. 165 – 167 Experiment 9 P. 167 – 169 Activity 4 P. 173		
<b>Assessment methods</b>	<b>Class test</b>	<b>Control test</b>	<b>Research project</b>
	<b>Practical investigation</b>	<b>Class work</b>	<b>Building of models, posters or interviews</b>
<b>Resources</b>	Transparencies Summary P. 180 – 183 Mind maps P. 184		
<b>Homework</b>	Exercise 10 P. 173 – 179 Question paper P. 185 – 200		

## LESSON PLAN 6 and 7: Physics Preparation File