Te Kura
Te Aho o Te Kura Pounamu
THE CORRESPONDENCE SCHOOL

CHEMISTRY CHO3031Y1E
TOPIC RESOURCE INFORMATION

ACHIEVEMENT STANDARD 91389 (VERSION 2) CHEMISTRY 3.3
Demonstrate understanding of the chemical processes in the world around us
Level 3, Internal assessment
3 credits

E. MICROPLASTICS

Achievement	Achievement with Merit	Achievement with Excellence
The student submits a report that: • Briefly describes the development of the plastic industry and describes the properties of plastics that made them so useful. • Describes the difference between the structure and properties of addition and condensation polymers. • Writes equations for the formation of addition and condensation polymers. • Writes equations for the hydrolysis of condensation polymers. • Explains the term microplastics and describes some of the environmental issues that have arisen from the use of plastics. • Describes possible solutions. • Is supported by the use of typical chemistry vocabulary, symbols, conventions and equations. You should have at least three equations supporting your discussion. • Shows understanding of Level 3 chemistry.	The student submits a report that: • Briefly describes the development of the plastic industry and explains the properties of plastics that made them so useful. • Explains the difference between the structure and properties of addition and condensation polymers. • Writes equations for the formation of addition and condensation polymers. • Writes equations for the hydrolysis of condensation polymers. • Explains how microplastics are formed and explains some of the environmental issues that have arisen from the use of plastics and explains some possible solutions. • Has explanations integrate chemistry vocabulary, symbols, conventions and equations. • Shows in-depth understanding of Level 3 chemistry.	The student submits a report that: • Describes the development of the plastic industry and comprehensively explains the properties of plastics that made them so useful. • Comprehensively explains the difference between the structure and properties of addition and condensation polymers and how they break down. • Writes equations for the formation of addition and condensation polymers. • Writes equations for the hydrolysis of condensation polymers. • Comprehensively explains how microplastics are formed and explains some of the environmental issues that have arisen from the use of plastics and explains some possible solutions. • Has consistent integration of chemistry vocabulary, symbols, conventions and equations. • Shows comprehensive understanding of Level 3 chemistry.

ASSESSMENT TIPS

To achieve this standard, you need to present your report **in your own words** and **show your understanding of level 3 chemistry**.

TIP 1

If you have difficulty in transforming the text given in the links into your own words, then it is useful to ask yourself questions, such as those listed below. You can get friend or family member to ask you the questions and then record your answers. Transcribe your answers and then weave them into your report.

Please note that these questions are only **some** of the questions you could ask yourself, so don't limit your report to these only!

Background

1. Why are plastics so popular?
2. When were synthetic plastics developed?
3. When were plastics and microplastics seen to be a problem?

Chemistry: How plastics are made and how they break down

1. Can I explain terms like 'polar', 'non-polar', 'addition polymer', 'condensation polymer', 'catalyst', 'weak acid', and 'hydrolysis'?
2. Can I explain the properties of plastics which make them so popular?
3. Can I write equations for the formation of addition polymers and condensation polymers?
4. Can I write equations for the hydrolysis of some polymers under acidic and basic conditions?
5. Have I written my equations using correct chemical language (e.g. using subscripts)
6. Are all plastics the same?
7. If not, what makes them different from each other?
8. Have I drawn my own molecules and not just copied and pasted pictures from the internet?

Advantages and disadvantages

1. Can I describe at least two issues associated with microplastics and plastics in general?
2. Can I explain some of the interventions that are carried out to minimise harm?

TIP 2

When you read through the links or watch the videos given on *My Te Kura* or in the task, make notes using key words or phrases in your log book, CHO3031A. When you write your report, use these key words rather than the text given in the links.

TOPIC RESOURCES

MICROPLASTICS

Your first source is the modules you should have completed – CHO3001, CHO3051, CHO3052.

EXTRA SOURCES FOR MORE DETAIL

GENERAL OVERVIEW

1. https://oceanservice.noaa.gov/facts/microplastics.html
2. www.chem1.com/acad/webtext/states/polymers.html
3. www.creativemechanisms.com/blog/eleven-most-important-plastics The 11 most important plastics and their properties
4. www.compoundchem.com/2015/04/30/plastics/
5. www.climatechangecu.com/human-impacts-on-the-environment/the-problem-of-microplastics-climate-change
6. www.thelancet.com/journals/lanplh/article/PIIS2542-5196(17)30121-3/fulltext
7. www.theguardian.com/environment/2018/mar/12/microplastic-pollution-in-oceans-is-far-greater-than-thought-say-scientists

CHEMISTRY OF PLASTICS (THIS SHOULD BE YOUR KEY FOCUS)

8. https://youtu.be/oyOJajPJptA Addition polymers
9. https://youtu.be/IA9I4IbA1XI Condensation polymers
10. www.youtube.com/watch?v=-d14DmSBuAQ
11. www.dynamicscience.com.au/tester/solutions1/chemistry/polymers1%20DM.htm Polymerisation
12. www.bbc.com/bitesize/guides/ztr7b82/revision/1 Do all five pages
13. https://youtu.be/gIvf6iG3Fok Hydrolysis
14. https://en.wikipedia.org/wiki/Polymer_degradation
15. www.rsc.org/Education/Teachers/Resources/Inspirational/resources/6.1.3.pdf

ISSUES AROUND PLASTICS

16. www.sciencelearn.org.nz/resources/2517-flight-plastics-recycling-technology
17. www.sciencelearn.org.nz/resources/2516-plastics-and-recycling
18. www.sciencelearn.org.nz/videos/985-biopolymer-network-and-barnes-plastics-zealafoam
19. www.sciencelearn.org.nz/labelling_interactives/7-modern-landfill-system
20. www.youtube.com/watch?v=FjT8GGoETQg Are you eating plastic for dinner?

OTHER POSSIBLE SOLUTIONS

21. www.waterworld.com/articles/wwi/print/volume-31/issue-6/featured-articles/microplastics-a-tiny-problem-needing-a-massive-solution.html
22. www.sciencenewsforstudents.org/blog/eureka-lab/tiny-particles-help-plastic-break-down-sun
23. www.acsh.org/news/2018/09/06/some-cool-chemistry-using-light-turn-waste-plastic-hydrogen-fuel-13387

24. www.youtube.com/watch?v=cHWYoDKYnQo Recycle plastics into roads
25. www.scientificamerican.com/article/the-plastics-revolution-how-chemists-are-pushing-polymers-to-new-limits/ Polymers made from starch
26. www.youtube.com/watch?v=gghoPtk3VGE Plastics and the future
27. www.youtube.com/watch?v=HQTUWK7CM-Y How can we keep plastics out of the oceans?

Additional sources may be used and must be quoted (full web link) in the bibliography to verify the source.