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| **Overall Expectations** | | **Specific Expectations** |
| A1. Demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analysing and interpreting, and communicating)  A2. Identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields.  C2. Investigate the physical and chemical properties of organic compounds, and analyse some common organic chemical reactions  C1. Evaluate the impact on society, human health, and the environment of products made using organic compounds  . | | A1.1 Formulate relevant scientific questions about observed relationships, ideas, problems, or issues, make informed predictions, and/or formulate educated hypotheses to focus inquiries or research  A1.8 Synthesize, analyse, interpret, and evaluate qualitative and/or quantitative data to determine whether the evidence supports or refutes the initial prediction or hypothesis and whether it is consistent with scientific theory; identify sources of bias and/or error; and suggest improvements to the inquiry to reduce the likelihood of error  A1.12 Use appropriate numeric, symbolic, and graphic modes of representation, and appropriate units of measurements  A1.11 Communicate ideas, plans, procedures, results, and conclusions orally, in writing, and/or in electronic presentations, using appropriate language and a variety of formats  A2.1 Identify and describe a variety of careers related to the fields of science under study and the education and training necessary for these careers  A2.2 Describe the contributions of scientists, including Canadians to the field under study  C2.7 Conduct an inquiry to synthesize a common organic compound  C1.2 Research a useful product made from one or more organic substances, and assess the environmental impact of the production, use, and disposal of the product  C1.1 Identify various materials and products used in everyday life that are made from organic compounds and assess the benefits of those products for society, as well as the health hazards they pose |
| **Concepts** | | |
| **Terminology** | | **Theory** |
| * Enzyme * Temperature * Coagulation | * Organic molecules * Polymer * Plastic | * Hydrocarbon * Organic molecules * Functional grouping |
| **Material to prepare** | | |
| * Computer * Copy of case study: Are bioplastics the solution? | | |
| **Context**   * Present a video or an article on plastics production * Present the video: **Du pétrole au plastique** [<https://www.youtube.com/watch?v=P9UvzH02o-A> ] * Present the video: **Comment c’est fait, Les sacs de plastique** [<https://www.youtube.com/watch?v=ofs2xm9omH8>] * Discuss the characteristics of plastics and the decaying process * Present the video: **Microplastique comment se forment-ils ?** *[* [*https://youtu.be/1aZSXiaBxnQ*](https://youtu.be/1aZSXiaBxnQ) *]* * Article from Let’s Talk Science; *We Use a Lot of Plastic [*[*https://letstalkscience.ca/educational-resources/stem-in-context/we-use-a-lot-plastic?\_ga=2.70323088.1609200711.1623354680-2138215416.1622830676*](https://letstalkscience.ca/educational-resources/stem-in-context/we-use-a-lot-plastic?_ga=2.70323088.1609200711.1623354680-2138215416.1622830676) *]* * Presentation of research assignment | | |
| **Activity - Research on bioplastics**   * Research and oral presentation | | |
| **Pushing further**   * Create signs to encourage the recycling of plastic in your school * Create podcasts to be played during morning announcements | | |
| **Assessment**   * Summative: Research and oral presentation on bioplastics | | |
| **Resources**   * Case study: Are bioplastics the solution? * Assessment grid \_Bioplastics * Internet * [Accros au plastique](https://plus.lapresse.ca/screens/1ea2e0ef-3ada-49f0-bd66-7c40cae394eb__7C___0.html) *[*[*https://plus.lapresse.ca/screens/1ea2e0ef-3ada-49f0-bd66-7c40cae394eb\_\_7C\_\_\_0.html*](https://plus.lapresse.ca/screens/1ea2e0ef-3ada-49f0-bd66-7c40cae394eb__7C___0.html)*]* * [Peut-on se passer des plastiques](https://synchronex.ca/nouvelles/peut-on-se-passer-des-plastiques-dans-lemballage%E2%80%89/) *[*[*https://synchronex.ca/nouvelles/peut-on-se-passer-des-plastiques-dans-lemballage%E2%80%89/*](https://synchronex.ca/nouvelles/peut-on-se-passer-des-plastiques-dans-lemballage%E2%80%89/) *]* * The 100% biodegradable packaging is coming soon *[*[*https://www.bpkpackaging.com/2018/09/05/the-100-biodegradable-packaging-is-coming-soon/*](https://www.bpkpackaging.com/2018/09/05/the-100-biodegradable-packaging-is-coming-soon/)*]* * [4 innovations de l’industrie agroalimentaire](https://www.cartoffset.com/4-innovations-de-lindustrie-agroalimentaire-pour-reduire-le-plastique-dans-nos-emballages/)  *[*[*https://www.cartoffset.com/4-innovations-de-lindustrie-agroalimentaire-pour-reduire-le-plastique-dans-nos-emballages/*](https://www.cartoffset.com/4-innovations-de-lindustrie-agroalimentaire-pour-reduire-le-plastique-dans-nos-emballages/)*]* * Innovating [dairy packaging until the cows come home *[*](https://tctranscontinental.com/fr-ca/emballages/marches/fromages-et-produits-laitiers)[*https://tctranscontinental.com/en-us/packaging/markets/cheese-dairy*](https://tctranscontinental.com/en-us/packaging/markets/cheese-dairy)*]* * [Bioplastique et plastique fossile](https://fliphtml5.com/mjnth/edzm/basic) *[*[*https://fliphtml5.com/mjnth/edzm/basic*](https://fliphtml5.com/mjnth/edzm/basic)*]* * [Les résidus de filtration](https://www.laterre.ca/du-secteur/formation/les-residus-de-filtration-du-lait-valorises) *[*[*https://www.laterre.ca/du-secteur/formation/les-residus-de-filtration-du-lait-valorises*](https://www.laterre.ca/du-secteur/formation/les-residus-de-filtration-du-lait-valorises)*]* * [Bioplastique Lactips](https://www.agro-media.fr/tag/bioplastique) *[*[*https://www.agro-media.fr/tag/bioplastique*](https://www.agro-media.fr/tag/bioplastique)*]* * [Un plastique compostable fait de déchets](about:blank) *[*[*https://novae.ca/un-plastique-compostable-fait-de-dechets/*](https://novae.ca/un-plastique-compostable-fait-de-dechets/)*]* * Milk-based plastics plastics to reduce environmental damage * *[*[*https://cordis.europa.eu/article/id/254165-milkbased-plastics-plastics-to-reduce-environmental-damage*](https://cordis.europa.eu/article/id/254165-milkbased-plastics-plastics-to-reduce-environmental-damage)*]* * [Du bioplastique made in Québec](https://unpointcinq.ca/economie/bioplastique-compostable-quebec/) *[*[*https://unpointcinq.ca/economie/bioplastique-compostable-quebec/*](https://unpointcinq.ca/economie/bioplastique-compostable-quebec/)*]* * [Les bioplastiques biodégradables](https://www.emballagesmagazine.com/mediatheque/2/9/0/000035092.pdf) *[*[*https://www.emballagesmagazine.com/mediatheque/2/9/0/000035092.pdf*](https://www.emballagesmagazine.com/mediatheque/2/9/0/000035092.pdf)*]* * [Remplacer les agents de conservation chimiques par un biofilm fonctionnel aux propriétés antimicrobiennes, antioxydantes et bioréactives.](https://www.cbc.ca/news/canada/nova-scotia/cape-breton-researchers-looking-into-plastic-that-kills-covid-19-1.5633150) [[*https://www.cbc.ca/news/canada/nova-scotia/cape-breton-researchers-looking-into-plastic-that-kills-covid-19-1.5633150*](https://www.cbc.ca/news/canada/nova-scotia/cape-breton-researchers-looking-into-plastic-that-kills-covid-19-1.5633150)*]* * In search of a natural solution against spoilage bacteria and pathogens in poultry and frozen products [<https://canadianfoodinnovators.ca/project/in-search-of-a-natural-solution-against-spoilage-bacteria-and-pathogens-in-poultry-and-frozen-vegetable-products>] | | |