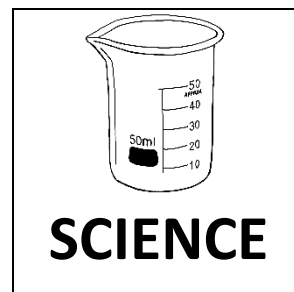




Research Task



Subject:	HSC Chemistry
Year:	12
Task:	3
Due Date:	Term 2, Week 6 – June 5 th 2020
Marks:	/65
Weighting:	20%
Assessment Mode:	Research Task

Outcomes

CH11/12-5 analyses and evaluates primary and secondary data and information

CH11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose

CH12-14 analyses the structure of, and predicts reactions involving, carbon compounds

Marking Criteria:

Students will be assessed on their ability to:

Use secondary sources to research the use of biofuels as alternatives fuel sources.

Describe the process of biofuel creation.

Outline the advantages and disadvantages of biofuels.

Compare the use of ethanol as an alternative to petroleum.

Outline the differences and relative merits in the use of ethanol as an alternative to petroleum.

Complete a bibliography and evaluate sources for reliability and relevance.

Marking criteria is attached for referral throughout the research task assessment. Please read it carefully to include all parts required.

Task Submission

Students will be required to submit the task on Google Classroom on the due date. If students require further support, they will be required to contact their teacher before the due date, so that an alternative arrangement can be organised. All issues relating to the non-submission of tasks will be dealt with by the process outlined in your Assessment Booklet. A copy of the Year 12 Assessment Booklet is located on the school's website.

SECTION 1: Research on Biofuels.

Use secondary sources to research biofuels and ethanol in order to answer the following questions concisely in your own words.

1. Define biofuels, describe their properties, how they are formed and provide examples.
2. Explain why biofuels were developed. Include at least 3 examples and their uses. Include pictures of each.
3. Create a table to compare the advantages and disadvantages of the production and use of biofuels.

SECTION 2: Comparison of Ethanol as an Alternative to Petroleum.

Use secondary sources to research the following in order to provide concise answers in your **own words**.

1. Define ethanol and state its classification as a compound.
2. Is ethanol renewable or non-renewable? Describe how ethanol is produced.
3. Outline why ethanol would be used as an alternative to petroleum.
4. Use the table to compare the benefits and limitations of ethanol with octane in relation to:
 - a. oxygen requirements for complete combustion per mole and per gram (include balanced equations).
 - b. energy production per mole and per gram

(Compare means to show how things are similar or different)

OCTANE			
	Identify & Describe	Benefits	Limitations
Oxygen requirements for complete combustion per mole and per gram			
Energy production per mole and per gram			

ETHANOL			
	Identify & Describe	Benefits	Limitations
Oxygen requirements for complete combustion per mole and per gram			
Energy production per mole and per gram			

SECTION 3: Long Response

Use the information gathered in Section 1 and 2 to answer the following question:

“Evaluate ethanol’s effectiveness as an alternative fuel to petroleum”

(Evaluate means to make a judgement based on criteria; determine the value of)

Your response should be approximately half a page long.

SECTION 4: BIBLIOGRAPHY

In completing this task you should use a variety of secondary sources and ensure each source is correctly referenced using a standard referencing format. (See the format below)

=For Books:

Author(s) Surname followed by initials	<i>Title of publication</i> (using Italics)	Year of Publication	Publisher	Place of Publication	Pages number/s
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Example: Thomas, G. *Energy Resources*. 2005. Macquarie Publishing. Sydney. p561

=For Encyclopaedias

'title of article'	<i>title of encyclopaedia</i> (italics)	year of publication	publisher	place of publication (place & state, if not a capital city)	volume number	page number/s
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Example: 'Energy Resources', *The World Book Encyclopedia* 2004, World Book, Sydney, vol. 8, pp. 115.

=For online newspaper articles

author (surname, initials)	year of publication	'title of article' (in single quotation marks)	<i>newspaper name</i> (italics)	date	page number/s
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Example: Bantick, C 2004, 'Tackling bullies' *The Hobart Mercury*, 18 May, p.28.

=For web sites:

Title of web page	Internet address	Date accessed
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Marks								
Section 1			Section 2				Section 3	Bibliography
Q1 /6	Q2 /6	Q3 /6	Q1 /4	Q2 /6	Q3 /4	Q4 /12	/16	/5

MARKING CRITERIA

Outcome	Marking Guidelines Section 1: Question 1	Marks/Grade
	Correctly defines biofuels. Describes at least 3 properties. Explains thoroughly how they are formed. Identifies 3 examples.	6

CH12-5 CH12-14	Correctly defines biofuels. Describes at least 2 properties or briefly lists 2. Explains how they are formed. Identifies 1-2 examples.	4-5
	Includes some relevant information.	1-3
	Question not attempted.	0

Outcome	Marking Guidelines Section 1: Question 2	Marks/Grade
CH12-5 CH12-14	Correctly explains why biofuels were developed. Describes at least 3 examples and explains their use. Pictures included.	6
	Correctly explains why biofuels were developed. Describes at 1-2 examples and explains their use. Pictures included.	4-5
	Includes some relevant information or provides pictures.	1-3
	Question not attempted.	0

Outcome	Marking Guidelines Section 1: Question 3	Marks/Grade
CH12-5 CH12-14	Table format comparison of advantages and disadvantages of production and use of biofuels. Thoroughly explains at least 3 advantages and disadvantages.	6
	Table format comparison of advantages and disadvantages of production and use of biofuels. Thoroughly explains at least 2 advantages and disadvantages.	4-5
	Includes some relevant information on the comparison of advantages and disadvantages of production and use of biofuels. Briefly explains at least 1 advantages and disadvantages. May or may not be in a table.	1-3
	Question not attempted.	0

Outcome	Marking Guidelines Section 2: Question 1	Marks/Grade
CH12-5 CH12-14	Defines ethanol and classifies it type of compound.	3-4
	Either defines ethanol or classifies it type of compound.	1-2
	Question not attempted.	0

Outcome	Marking Guidelines Section 2: Question 2	Marks/Grade
CH12-5 CH12-14	Correctly identifies ethanol as renewable or non-renewable. Gives a thorough description of how it is produced.	6
	Correctly identifies ethanol as renewable or non-renewable. Gives a brief description of how it is produced.	4-5
	Correctly identifies ethanol as renewable or non-renewable. Gives other relevant information.	1-3
	Question not attempted.	0

Outcome	Marking Guidelines Section 2: Question 3	Marks/Grade
CH12-5 CH12-14	Explicitly outlines why ethanol would be used as an alternative fuel.	3-4
	Briefly outlines why ethanol would be used as an alternative fuel.	1-2
	Question not attempted.	0

Marking criteria continues on the next page

Outcome	Marking Guidelines Section 2: Question 4	Marks/Grade
	Extensive comparison of octane and ethanol, including limitations and benefits of each, in the categories provided. Demonstrates an extensive knowledge and understanding of the combustion reaction, writing balanced chemical equations	11-12

CH12-5 CH12-7 CH12-14	octane and ethanol are compared in the given categories. Information is of a detailed and of a high standard. Demonstrates a thorough knowledge and understanding of the combustion reaction, writing balanced chemical equations	8-11
	Octane and ethanol are compared in the given categories. Information is of a sound quality and lacks detail. Demonstrates a sound knowledge and understanding of the combustion reaction, writing balanced chemical equations	6-7
	Octane and ethanol compared in some of the given categories. Demonstrates a sound understanding of combustion. Detail is basic.	4-5
	Octane and ethanol compared in some of the given categories. Detail is limited.	1-3
	Question not attempted.	0

Outcome	Marking Guidelines Section 3 Long Response	Marks/Grade
CH12-5 CH12-7 CH12-14	Evaluates in detail how the effectiveness of ethanol as an alternative fuel to petroleum stating their opinion and providing extensive evidence justifying their decision.	15-16
	Explains the effectiveness of ethanol as an alternative fuel to petroleum stating their opinion and providing good evidence justifying their decision.	11-15
	Describes the effectiveness of ethanol as an alternative fuel to petroleum stating their opinion and providing good evidence. Does not justify their decision.	6-10
	Identifies the effectiveness of ethanol as an alternative fuel to petroleum, providing some evidence.	1-5
	Question not attempted.	0

Bibliography

Outcome	Bibliography Marking Guidelines	Marks/Grade
H13.1 c)	Selects and uses appropriate methods to acknowledge a wide variety of sources of information (at least 6 references from at least 2 different source (example: Websites and encyclopedia)	5
	Selects and uses appropriate methods to acknowledge a good variety of sources of information (at least 6 references from at least 1 source)	4
	Does not use the appropriate methods to acknowledge a good variety of sources of information (at least 6 resources from at least 1 or 2 sources)	3
	Does not use the appropriate methods to acknowledge sources of information (at least 4 references from at least 1 or 2 sources)	2
	Uses 3 or less references and does not use the appropriate methods to acknowledge sources of information	1
	Does not include a bibliography	0

Total /65