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| **Assessment Cover Sheet****Instrument Number 1** | **Term 1 2022** |
| **Student Name** |  |
| **Year Level** | Year 7 | **Handout Date**  | First Lesson of Week 8 |
| **Class** | SCI071A, SCI071B, SCI071C, SCI071N, SCI071E, SCI071G, SCI071H, SCI071M, SCI071S | **Interim Check Date** | Last lesson of Week 8 |
| **Teacher** |  | **Rough Draft Date** | Second lesson of week 9 |
| **Unit Number/Name** | Chemistry | **Due Date** | **Last Lesson of Week 9** |

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| **Task Title and Genre** | Microplastics |
| **Target Audience** | Teacher | **Details:** | 6 lessons in class + work at home |
| **Syllabus Assessment Technique** | Investigation and Presentation - Infographic |
| **Assessment Conditions** | Summative |
| **Seen/Unseen** | Seen |  |  |  |
| Materials handed out prior to assessment? | No [ ]  | Yes [ ]  | **Conditions** |
| Practical work, including investigation planner will be completed as a group. * Comparing and analysing results is to be completed individually.
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| **Time/Length** | 6 lessons |
| **Teacher Input** | In class guidance |
| **Individual/Group Work** | Combination Individual and Group Work |
| **Allowable Resources** | Internet research |
| **Criterion** | **Marks** |  |
|  | A+ | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | D- | E+ | E | E- |
| Science Understanding | /24 | ≥23 | ≥20  | ≥19  | ≥ 18  | ≥17 | ≥16 | ≥14½  | ≥12  | ≥11 | ≥10 | ≥7½  | ≥6 | ≥5 | ≥1½  | < 1 |
| Science Inquiry | /26 | ≥25 | ≥22  | ≥21 | ≥19½  | ≥18½  | ≥17 | ≥16  | ≥13 | ≥12 | ≥10½  | ≥ 8 | ≥6½  | ≥5½  | ≥1½  | < 1 |
| **Differentiation: If assessment conditions have been adjusted details are provided below** |
| **Acknowledgement of assessment responsibility** |  |
| I understand the consequences of plagiarism/cheating and confirm this is my own work. |
| **Student Signature:**  | **Date:**  |

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| B:\Common\_NEW MSHS LOGO\NEW LOGO - B&W\BW-Shield Only white outline.png | **Maroochydore State High School****Standards Matrix for Year 7 Chemistry Investigation**  |

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| --- | --- | --- | --- | --- | --- |
| Assessable Elements | A | B | C | D | E |
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| Science Understanding**/24** | Thorough description of microplastics and the impact they have on the environment and marine environments.A+≥23 A≥20 A-≥19 | Informed description of microplastics and the impact they have on the environment and marine environmentsB+≥18 B≥17 B-≥16 | Description of microplastics and the impact they have on the environment and marine environments.C+≥14½ C≥12 C-≥11 | Identification of microplastics and the impact they have on the environment and marine environmentsD+≥10 D≥7½ D-≥6 | Statements about microplastics.E+≥5 E≥2 E-≥1 |
| Science Inquiry Skills**/26** | Concise and accurate use of graphs and models to represent and analyse patterns or relationships in data. Concise and coherent use of appropriate language and accurate representations when communicating findings and ideas to specific audiences.A+≥25 A≥22 A-≥21 | Accurate use of graphs and models to represent and analyse patterns or relationships in data. Coherent use of appropriate language and accurate representations when communicating findings and ideas to specific audiences.B+≥19½ B≥18½ B-≥17 | Use of graphs and models to represent and analyse patterns or relationships in data.Use of appropriate language and representations when communicating findings and ideas to specific audiences.C+≥16 C≥13 C-≥12 | Use of graphs and models to represent pattern in data.Use of everyday language and representations when communicating findings and ideas to audiences.D+≥10½ D≥8 D-≥6½  | Use of graphs and models.Fragmented use of language and representations when communicating findings and ideas to audiences.E+≥5½ E≥1½ E-≥1 |

 TeacherFeedback:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Task: Investigating Microplastics

**Aim:** To separate a salt mixture using appropriate techniques to investigate microplastics found in salt.

**Section 1 : INDIVIDUAL WORK – Investigating Microplastics.**

Read the information and answer the questions.

Plastics were first synthesized in 1907 but did not start becoming popular until the 1960s.

**Task 1:** Before you learn more about plastics, complete the following anticipatory guide. Read the statements below, and in the “Before Reading” column, mark if you agree or disagree with the statement. **(2 marks SU)**



**Task 2:** Read the “Microplastic Reading” on the next page.

**Task 3:** Once you are finished, return to your anticipatory guide. Read the statements again and in the “After Reading” column, mark if you agree or disagree with the statement. **(2 marks SU)**

Microplastics Reading

Turn up the Heat

Plastics are synthetic compounds and not naturally found on earth; Scientists have to make plastic in a lab. The building blocks of plastic are crude oil, natural gas, or coal.

We assume that when we throw our plastic bottles into the recycling bin, the plastic will get remelted down and transformed into a new item, but generally, that is not the case. A lot of the time, our plastic bottles end up in landfills or the ocean. Plastics do not naturally decompose or rot. Plastics have a lifespan of 450 years to 5,000 years, depending on the type of plastic.

Like with the natural eroding of land, the sun, the wind, and waves can start to deteriorate plastics and turn them into microplastics. Microplastics are pieces or fragments of plastic that are 5 millimetres (mm) long or smaller.

One of the biggest causes of microplastics is not necessarily the plastics that erode in the ocean or landfills. Car tires on the road are one of the primary causes of microplastics. Another primary cause is run-off from showers and washing machines. Lots of fabrics contain plastic fibres, and some soaps and face washes contain tiny exfoliating plastic beads.

Our water treatment facilities can filter out larger pieces of plastic that end up in our sewage systems. Still, the smaller the pieces of plastic, the harder it is to filter and can be introduced into our drinking water or rivers and the ocean.

Animals and fish end up confusing these small pieces of plastic as food and consume them. We, in turn, consume those animals. Some scientists even report that the average human consumes a credit card size of microplastics A WEEK! Studies have not been thorough enough on the human consumption of microplastics. Still, research on animals and fish has shown that these microplastics can cause internal injuries, inflammations, hormonal imbalances, and death.

**Now go back and fill out the “After Reading” column on your anticipatory guide.**

**Task 4: Explain** your initial ideas about microplastics.

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**(4 marks SU)**

**Task 5:** Hypothesis

In this lab, you will be looking for microplastic fibres in a sample of sea salt. Remember, microplastics are 5 mm or less in size, so you probably will not be able to see them with your naked eye.

You will use a microscope to view the microplastic fibres.

**Predict** how many types of microplastics will be found in salt.

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| I **predict** that there will be ………… types of microplastics in the salt because ………………………………………… |

**(4 marks SI)**

**Section 2 : CO-OPERATIVE WORK – Investigating Microplastics Lab.**

Microplastics Investigation

**Method:**

1. Obtain 10.00 grams of sea salt and record the mass in your data table.

2. Obtain 200 mL of distilled water and record the volume in your data table.

3. Add the sea salt to your distilled water and stir to create a homogeneous mixture (a solution).

4. Obtain the piece of filter paper you will be using when filtering your solution. Draw 1 cm by 1 cm squares (with a pencil) on your piece of filter paper.

5. Set up your vacuum filtration of gravity filtration.

6. Pour your sea saltwater solution through the filter paper.

7. Using tweezers, remove the filter paper from the funnel keeping the filter paper as horizontal as possible.

8. Place the filter paper underneath a microscope and focus the microscope.

9. Count and record how many pieces of microplastic you observe in each 1 cm by 1 cm square on your filter paper. Include in your observations section what the microplastics looked like (squares, chucks, fabric, etc.).

10. Repeat Steps 1-9 for each of the different salt samples (3 different types).

11. Clean-up: Pour your salt solution down the drain, place filter paper in the garbage, and clean all materials used.

**Task 6:** Materials

**List** the equipment that will be required after reading the procedure above.

**(3 marks SI)**

**Conduct your investigation**.

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| **Substance (Salt type)** | **Mass of Salt (g)** | **Volume of distilled water (mL)** | **Number of microplastics seen** | **Average Number of Microplastics Seen** |
| **Sample 1** | **Sample 2** | **Sample 3** |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |

**QUESTION 6:** Results **(6 marks SI)**

Observations

Write down 4 qualitative observations from your experiment.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(4 marks SI)**

Drawing

Include a drawing of the different types of microplastics you observed. **(4 marks SI)**

**Section 2 – INDIVIDUAL WORK – Presentation of findings**

You will create an infographic using Canva or Piktochart (free to use) to make the general public aware of their sea salt consumption. An infographic is a digital poster that is not only visually appealing but communicates essential and relevant information.

Your infographic should include:

* The purpose of your experiment **(2 marks SU)**
* A description of your methods **(4 marks SI)**
* Your data (previous marks allocated)
* Your observations (a picture of your microplastics on your filter paper is a good idea!) (previous marks allocated)
* What physical properties allowed you to separate the sea salt, water, and plastic from one another? **(3 marks SU)**
* What separation techniques did you use and why? **(2 marks SI)**
* Your conclusions based on your experiment **(4 marks SU)**

Extension:

* Find 1 article online stating that consuming microplastics is safe for humans and find 1 article online stating that consuming microplastics is unsafe for human consumption.

Make sure the website is reliable and creditable. You can do this by using .edu or .gov sites, taking a closer look at the website's source, and searching for additional information that supports the website's stance.

State your belief of how the ingestion of microplastics may or may not be harmful for human consumption. Use quotes from the articles to back up your claims and make sure you reference the articles. Add this to your infographic.

**(5 marks SU)**

* How can you be an activist or encourage others to act to reduce plastic consumption? Add this to your infographic.

**(5 marks SU)**