#### National Space Centre - Risk Assessment Form

#### General Risk Assessment Reference – G463

| **Location** | National Space Centre |
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| **Equipment or Activity to be assessed** | Horizon Hydrogen Fuel Cell Car |
| **Description of Activity** | Commercially bought demonstration toy to show how water can be electrolysed into oxygen and hydrogen to power a small motor. |
| **Date of assessment** | 02/10/2024 |
| **Last review date (if applicable)** | 04/09/2023 |
| **Next review date** | October 2025 but earlier review date required following outcomes of accidents, absences and near misses, or changes to processes, work methods, materials, technology, equipment or legislation. |
| **Risk Assessment created by [name / date]** | Sophie Allan [02/10/2024] |
| **Authorised by Line Manager [name / date]** | Sophie Allan [02/10/2024] |
| **Authorised by Health and Safety Manager [name/ date]** | Katrina May Neve [02/10/2024] |

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| **What are the hazards?**  *Something with the potential to cause harm* | **Who might be harmed and how?** | **Control Measures**  *What is already in place to reduce the risk?* | **Additional Control Measures**  *What needs to be put in place to further reduce the risk?* | **Risk Rating**  *Refer to risk matrix below* | **Authorised by Health and Safety Manager** |
| Tripping on the car as it moves | Students or teacher moving about the room | Cars must be used on a table or set area  Let people know when the car is in operation |  | Likelihood: 2 Severity: 1  Risk Rating: 2  [Low] | Katrina May Neve  Health and Safety Officer  [02/10/2024] |
| Slipping on spilt water | Students or teacher moving about the room | Cars to be used on a table or set area.  Cars to be filled up with a beaker in the area they are used.  Water only to be carried across the room in sealed container  Each table has individual beaker of water. |  | Likelihood: 2 Severity: 1  Risk Rating: 2  [Low] | Katrina May Neve  Health and Safety Officer  [02/10/2024] |
| Ignition of collected hydrogen gas | Hydrogen could ignite if let out of the water bath in a large volume. Especially if mixed with oxygen | The gas is collected in a water bath and is very difficult to expose to heat.  H2 and O2 are produced in very small volumes.  The Hydrogen and Oxygen are stored separately. |  | Likelihood: 1 Severity: 2  Risk Rating: 2  [Low] | Katrina May Neve  Health and Safety Officer  [02/10/2024] |
| Inhalation of Hydrogen or oxygen produced | Inhalation of the gases produced by the fuel cell if not stored correctly. | Neither hydrogen nor oxygen are harmful if inhaled.  The car does not produce enough Hydrogen to displace air and suffocate. |  | Likelihood: 1 Severity: 1  Risk Rating: 1  [Low] | Katrina May Neve  Health and Safety Officer  [02/10/2024] |
| Drinking deionised water | Would have to consume for several weeks for any effect of ill health due to lack of ions. |  |  | Likelihood: 1 Severity: 1  Risk Rating: 1  [Low] | Katrina May Neve  Health and Safety Officer  [02/10/2024] |

**Risk Rating Matrix**

**Risk = Likelihood of injury x Severity of injury**

**R = L x S**

**Low risk = 1 – 6, Medium risk = 8 - 12, High risk = 15 - 25**

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|  | | **S = Severity of injury** | | | | |
| **Minor injury or illness (1)** | **First aid injury or illness (2)** | **3-day injury or illness (3)** | **Major injury or illness (4)** | **Fatality, disabling injury, etc (5)** |
| **L = Likelihood of injury** | Very unlikely (1) | 1 = Low | 2 = Low | 3 – Low | 4 = Low | 5 = Low |
| Unlikely (2) | 2 = Low | 4 = Low | 6 = Low | 8 = Medium | 10 = Medium |
| Likely (3) | 3 = Low | 6 = Low | 9 = Medium | 12 = Medium | 15 = High |
| **Very likely (4)** | 4 = Low | 8 = Medium | 12 = Medium | 16 = High | 20 = High |
| **Almost certain (5)** | 5 = Low | 10 = Medium | 15 = High | 20 = High | 25 = High |

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|  | **Risk Rating Definitions and Guidelines** |
| **Low** | **Minor to no injury.**  This is an acceptable level of risk. No further controls are required as the risk rating cannot be reduced any further. However, it is advised continual monitoring occurs to ensure that no changes/deviation of control measures occur. |
| **Medium** | **An injury requiring further medical assistance or is a RIDDOR related incident.**  It is advised that further control measures are implemented to reduce the risk rating to a low a level as possible. If the risk cannot be reduced to lower than a medium, then on-site monitoring should occur to ensure that all stipulated controls are bring adhered to. |
| **High** | **Death, paralysis, long term serious ill health.**  This is an unacceptable risk rating. Urgent interim controls should be implemented to reduce the risk so far as is reasonably practicable. If the risk rating cannot be reduced to lower than high, then a documented safe system of work should be implemented to control the activity. It may be necessary to seek further professional advice. Serious consideration should be given to the validity of carrying out the activity at all. Regular Monitoring of the activity should occur. |