**TASK 1: Reaction Time INVESTIGATION MARKING KEY**

**Logbook Checkpoints (30%)**

The teacher should monitor the use of the logbook while students are completing the task. This component assesses the evidence of each student’s contribution to the group and their participation in the investigation.

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| **Description** | **Marks** |
| **Part A: Background Research** | |
| Selects a range of reliable sources that are relevant and useful to the chosen topic | 4 – 5 |
| Selects a few sources that provide some information and evidence on the chosen topic | 2 – 3 |
| Selects sources that provide limited information about the chosen topic | 1 |
|  | **/5** |
| Makes notes that are relevant to the research questions, using the appropriate retrieval and/or note-making framework | 3 |
| Makes notes that contain some links to the research questions, using an appropriate retrieval and/or note-making framework | 2 |
| Makes notes that are presented in some order | 1 |
|  | **/3** |
| Formulates a specific and relevant testable question and/or hypothesis, using the correct format | 2 |
| Formulates a question that is not testable, specific, relevant or written in the correct format | 1 |
|  | **/2** |
|  | **/10** |
| **Part B: Planning the Investigation** | |
| Presents a clear and logical plan to collect valid and reliable data | 3 |
| Presents a clear plan, which lacks some detail, to collect valid and reliable data | 2 |
| Presents a plan to collect appropriate data | 1 |
|  | **/3** |
| Completes a detailed risk assessment using an appropriate framework |  |
| Completes a detailed risk assessment using an appropriate framework, which lacks some detail |  |
| Completes a risk assessment, which lacks detail |  |
|  | **/3** |
|  | **/6** |
| **Part B: Conducting the Investigation** | |
| Records observations, including raw data, clearly and logically in an appropriate format | 3 |
| Records observations, including raw data | 2 |
| Records limited or inadequate observations and/or raw data | 1 |
|  | **/3** |
| **Part C: Processing and Analysing Data** | |
| Provides evidence of processing data to show patterns and relationships, and analysing data to describe the patterns and relationships | 2 |
| Provides evidence of processing data to show patterns and relationships | 1 |
|  | **/2** |
| **Part C: Drawing Conclusions** | |
| Provides evidence of using data to make and justify conclusions that relate to the question/hypothesis being tested | 2 |
| Provides evidence of making simple conclusions not supported by evidence and/or related to the question/hypothesis being tested | 1 |
|  | **/2** |
| **Part C: Evaluating the Evidence** | |
| Provides evidence of evaluating the accuracy, reliability and validity of procedures and data | 2 |
| Provides evidence of identifying and describing difficulties experienced in conducting the investigation | 1 |
|  | **/2** |
| Suggest improvements to the design of the investigation | 2 |
| Suggests general improvements | 1 |
|  | **/2** |
|  | **/4** |
| **Logbook use** | |
| Logbook used appropriately and kept up to date | 3 |
| Logbook used appropriately and kept mostly up to date | 2 |
| Logbook used appropriately | 1 |
|  | **/3** |
| **Logbook Checkpoint Total** | **/30** |

**Draft Materials (5%)**

This component assesses that group draft materials and method.

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| **Description** | **Marks** |
| **Materials** | |
| Provides a complete list of all materials required for the investigation, including the quantities | 1 |
|  | **/1** |
| **Method** | |
| Selects and/or modifies procedures to collect valid and reliable data | 3 |
| Selects and/or modifies procedures that can be followed to collect appropriate data | 2 |
| With support modifies a procedure to collect appropriate data | 1 |
|  | **/3** |
| **Data collection** | |
| Outlines a format for the recording of observations, including raw data | 1 |
|  | **/1** |
| **Draft materials and method total** | **/5** |

**Workplace Health and Safety (10%)**

This component assesses each student’s safe work practices and group work during the investigation.

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| --- | --- |
| **Description** | **Marks** |
| **Working safely and effectively** | |
| Acts safely and works effectively both individually and in groups when conducting the investigation | 4 |
| Acts safely and works with a degree of effectiveness both individually and in groups | 3 |
| Acts safely and works with a degree of effectiveness both individually and in groups, most of the time | 2 |
| Acts safely most of the time and works with limited effectiveness both individually and in groups | 1 |
|  | **/4** |
| **Risk assessment** | |
| Assesses and manages risks, in detail, to ensure the safe use of equipment and techniques | 3 |
| Assesses and manages risks to ensure the safe use of equipment and techniques | 2 |
| Manages risks to ensure the safe use of equipment and techniques | 1 |
|  | **/3** |
| **Standard operating procedures** | |
| Uses standard operating procedures with precision, accuracy and consistency to ensure the safe collection of valid and reliable data | 3 |
| Uses standard operating procedures with some precision, accuracy and consistency to collect data | 2 |
| Follows directions for the safe use of equipment and techniques to collect data with some precision, accuracy and consistency | 1 |
|  | **/3** |
| **Workplace health and safety total** | **/10** |

**Group contribution (5%)**

This component assesses the contribution of students to the group during the investigation.

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| **Description** | **Marks** |
| Completes all required tasks to a satisfactory level | 3 |
| Completes most required tasks to a satisfactory level, with some tasks incomplete or poorly completed | 2 |
| Completes some required tasks to a satisfactory level, with most tasks incomplete or poorly completed | 1 |
|  | **/3** |
| Demonstrates an appropriate understanding of the investigation and the investigation process | 2 |
| Demonstrates a minimal understanding of the investigation and the investigation process | 1 |
|  | **/2** |
| **Group contribution total** | **/5** |

**Written Report (35%)**

This component assesses the student’s ability to follow a standard investigation report format to communicate their findings.

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| **Description** | **Marks** |
| **Abstract** | |
| Succinctly writes a summary of the investigation that includes the purpose of the investigation, a brief outline of the method and conclusions | 3 |
| Writes a summary of the investigation that includes the purpose of the investigation, a brief outline of the method and conclusions | 2 |
| Write a general summary of the investigation | 1 |
|  | **/3** |
| **Introduction** | |
| Succinctly writes an introduction that summarises the background information related to the investigation using correct scientific language, conventions and representations | 3 |
| Writes a general introduction that summarises the background information related to the investigation using some correct scientific language, conventions and representations | 2 |
| Writes a general introduction that summarises the background information related to the investigation using correct everyday language | 1 |
|  | **/3** |
| Writes a testable question and/or hypothesis | 2 |
| Attempts to write a testable question and/or hypothesis | 1 |
|  | **/2** |
|  | **/5** |
| **Materials and method** | |
| Provides a complete list of all materials required for the investigation, with quantities | 3 |
| Provides an incomplete list of all materials required for the investigation, with quantities | 2 |
| Provides a list of all materials required for the investigation, which may be incomplete, without quantities | 1 |
|  | **/3** |

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| Selects and/or modifies procedures to provide a clear and logical plan to collect valid and reliable data | 4 |
| Selects and/or modifies procedures to provide a plan to collect valid and reliable data, which may lack some detail | 3 |
| Selects and/or modifies procedures that can be followed to collect appropriate data | 2 |
| With support modifies a procedure to collect appropriate data | 1 |
|  | **/4** |
|  | **/7** |
| **Results** | |
| Organises data logically in appropriates formats to show patterns and relationships, including recording raw data in an appropriate format; and id applicable, carries out simple processing of raw data and plots data in an appropriate graph | 4 – 5 |
| Presents data to show patterns and relationships, including recording raw data; and if applicable, carries out simple processing of raw data and plots data in an appropriate graph | 2 – 3 |
| Presents data to show patterns and relationships and if applicable, plots data in a graph | 1 |
|  | **/5** |
| **Discussion** | |
| Describes the patterns and relationships of the data collected | 2 |
| Describes the patterns and relationships | 1 |
|  | **/2** |
| Evaluates the investigation discussing the relevance, accuracy, validity and reliability of the data | 3 |
| Evaluates the investigation by describing difficulties experienced when conducting the investigation | 2 |
| Evaluates the investigation by identifying difficulties experienced when conducting the investigation | 1 |
|  | **/3** |
| Suggests ways to improve the design of the investigation | 2 |
| Suggests general improvements to the investigation | 1 |
|  | **/2** |
|  | **/7** |

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| **Conclusion** | |
| Makes a conclusion and relates conclusion to the question and/or hypothesis being tested | 2 |
| Makes a conclusion and doesn’t relate it to the question and/or hypothesis being tested | 1 |
|  | **/2** |
| **Bibliography** | |
| Provides a bibliography that is consistent with school protocols | 2 |
| Provides a bibliography that includes inaccuracies or is inconsistent with school protocols | 1 |
|  | **/2** |
| **Communication** | |
| Communicates understandings and investigation findings using concise use of scientific language and representations | 2 |
| Communicates understandings and investigation findings using appropriate genre conventions | 1 |
|  | **/2** |
| **Written report total** | **/35** |

**Poster Presentation (15%)**

This component assesses the group’s ability to communicate the investigation findings in a poster presentation.

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| **Description** | **Marks** |
| **Presentation** | |
| Clearly, concisely and accurately explains scientific ideas, the investigation and investigation process, using correct scientific language, conventions and representations, and demonstrating a thorough understanding of the investigation | 4 |
| Provides a general explanation of scientific ideas, the investigation and investigation process, using some correct scientific language, conventions and representations, and demonstrating some understanding of the investigation | 3 |
| Provides a general explanation of scientific ideas, the investigation and investigation process, using some scientific language, and demonstrating some understanding of the investigation | 2 |
| Provides an explanation of scientific ideas, the investigation and investigation process, using everyday language, and demonstrating some understanding of the investigation | 1 |
|  | **/4** |
| Responds appropriately to audience questions | 2 |
| Responds to audience questions | 1 |
|  | **/2** |
|  | **/6** |
| **Poster** | |
| Succinctly provides a summary of the investigation that includes the purpose of the investigation, a brief outline of the method and conclusions | 4 |
| Provides a summary of the investigation that includes the purpose of the investigation, a brief outline of the method and conclusions | 3 |
| Provides a general summary of the investigation that includes the purpose of the investigation, a brief outline of the method and conclusions | 2 |
| Provides a general summary of the investigation | 1 |
|  | **/4** |
| Clearly and concisely presents written information using correct scientific language, conventions and representations | 3 |
| Presents written information using some correct scientific language, conventions and representations | 2 |
| Presents written information using correct everyday language and representations | 1 |
|  | **/3** |
| Displays written information that is legible and visible from the required distance | 2 |
| Displays written information that is not all legible and/or visible from the required distance | 1 |
|  | **/2** |
|  | **/9** |
| **Poster presentation total** | **/15** |