**2023**

**Year 12 Integrated Science – Unit 4**

**Task 8: Mouse trap car Validation**

**Assessment Type: Science Inquiry Validation**

**Weighting: 10%**

**Duration: 45 minutes**

**MARKING KEY**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |
| --- | --- |
| **Total Mark** |  |

*I acknowledge that all the information contained in this task is my own work and not taken from other sources. If other sources have been used they have been acknowledged in my references.*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Student Signature)

*Please see SEQTA for teacher feedback and comments.*

This final component of the Mouse trap investigation is a validation of your physics conceptual understanding behind a mouse trap car. You will be provided with a copy of your investigation to aide you in this validation.

Answer to following questions completely, using full sentences and including any formulas and/or calculations where appropriate.

1. What are two types of friction that impacted the performance off your vehicle? (2 marks)

1 mark per type of friction identified

Could include: static, sliding, rolling, or fluid

1. What problems related to friction did you encounter and how did you solve them? (3 marks)

1 mark for identifying a problem due to friction

2 marks for accurately explaining how they overcome the problem

1. What factors did you consider when deciding on the number of wheels you chose in your vehicle’s design? (2 marks)

1 mark per factor that was considered about the wheels

1. What kind of wheels did you use on each axle? Was this the effect of using large or small wheels?

(2 marks)

1 mark per type of wheel was identified and why it was used.

1. Discuss the impact that the length of the lever arm had in the pulling force of your vehicle. (2 marks)

2 marks for accurately describing what impact the length of the lever arm had.

1. Explain how each of Newton’s Laws of Motion apply to the performance of your vehicle. (6 marks)

1 mark per Newton’s Law identified (max 3 marks)

1 mark for explaining how each law impacts the vehicles performance (max 3 marks)

1. Discuss how energy was transformed in your vehicle. (3 marks)

1 mark for discussing stored potential energy in the mousetrap

1 mark for discussing the kinetic energy moving the vehicle

1 mark for discussing how it links from one energy form to the other

1. Discuss how you increased the energy efficiency of your vehicle (i.e. how did you reduce the wasted output energy?) (2 marks)

1 mark for identifying the wasted energy

1 mark for explaining how they reduced it

1. Using the formula for velocity, where and the data you collected on Race Day, calculate the velocity of your vehicle. Ensure you show all working. (3 marks)

1 mark for using data from Race Day

1 mark for using correct formula and values

1 mark for correct answer with statement answering question

See next page for reflections.

**SELF AND PEER REFLECTION: (5 marks)**

Reflect on how you and your partner worked on this assessment.

Using the below table, rate you and your partner’s efforts on the following attributes, using the below values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Values: | 5 = Excellent | 4 = Above average | 3 = Average | 2 = below average | 1 = poor |

|  |  |  |
| --- | --- | --- |
| Attribute | Myself | My partner |
| Participate in group discussions |  |  |
| Helped keep the group on task |  |  |
| Contributed useful design and/or modification ideas |  |  |
| Contributed to the build |  |  |
| To improve, next time we could…. | | |
|  | | |

1 mark per answered reflection.

**END OF ASSESSMENT**