

## Grade 10 Science



### PHYSICS - Rat Trap Racers – Assessment Guidelines

Assessment for this unit of work will consist of 4 items.

<b>Worksheet</b>	<b>10 marks</b>
<b>Rat Trap Car Design + Testing</b>	<b>30 marks</b>
<b>Reflective Journal</b>	<b>10 marks</b>
<b>Experimental Report</b>	<b>50 marks</b>

Rat trap car design and testing will be assessed as follows:

Car design (15 marks) – construction quality and modifications will enhance this score

Car performance (15 marks) – points will be awarded as follows:

*Only total displacement will be assessed, not distance travelled!*

0 – 2m = 5 marks

2 – 3m = 8 marks

3 – 4m = 10 marks

4 – 5m = 12 marks

5 – 6m = 13 marks

6 – 7m = 14 marks

> 7m = 15 marks

Overall class champions will also receive a chocolate based reward.

Each group will have 4 attempts and the greatest displacement will be the recorded result.

## Report Guidelines

*The experimental report will consist of the following sections:*

Aim

Hypothesis

Materials + Method

Results

Discussion

Conclusion

The aim of the experiment was to design a car that utilises the potential energy of a rat trap to power a car the longest distance possible. This must be written in your own words, and in third person passive tense.

Your hypothesis must detail an aspect of the design that you could change to enhance the distance the car travelled. E.g. By using larger wheels connected to the drive axel, the car would travel further, or by using rubber bands on the wheels the traction level would be higher and the car would travel further. This must relate to the car you designed and again be written in third person passive tense.

The materials and method will detail the construction and testing process of YOUR car. An uninformed reader must be able to recreate your car solely from reading this section. This can be broken into a stock design (unmodified) and a modified section. Pictures may assist in this section and again this must be written in your own words, and in third person passive tense.

The results section will detail the distance travelled by your car across each test run. This can and should include results from test designs prior to modification.

The discussion section should detail the physics behind the design of the car and any modifications you had made.

The following questions should be answered by your discussion:

*Explain the energy transfer processes that occur when your rat trap car is tested.*

*Identify three sources of friction/traction that are important to the cars motion, and whether these have a positive or negative effect on the distance travelled.*

*What modifications were performed, what problems were these designed to overcome and how did these effect the distance travelled.*

*A discussion of potential future improvements to enhance the rat trap car.*

The conclusion should relate to your hypothesis regarding your rat trap car design and its performance.