

# Physics Practical Assessment Task – Preliminary Course

**Date**            Friday 1<sup>st</sup> April

**Where**           In class

**Length**          50 minutes

The Assessment task will consist of three tasks.

**The content from the following three dot points in the syllabus will be used to assess the practical components of the course.**

8.4.1.i	Plan, choose equipment or resources for, and perform a first-hand investigation to measure the average speed of an object or a vehicle
8.4.2 iii	Plan, choose equipment or resources for and perform a first-hand investigation to demonstrate vector addition and subtraction
8.4.2 v	Plan, choose equipment or resources and perform first-hand investigations to gather data and use available evidence to show the relationship between force, mass and acceleration using suitable apparatus

**The practical skills listed below from Syllabus Module 8.1. will be assessed.**

**11.2 plan first-hand investigations to:**

- a) demonstrate the use of the terms ‘dependent’ and ‘independent’ to describe variables ...
- c) design investigations that allow valid and reliable data and information to be collected
- e) predict possible issues that may arise during the course of an investigation ...

**12.1 perform first-hand investigations by:**

- a) carrying out the planned procedure, recognising where and when modifications are needed ...
- d) identifying and using safe work practices during investigations

**12.2 gather first-hand information by:**

- a) using appropriate data collection techniques ...
- d) measuring, observing and recording results in accessible and recognisable forms, carrying out repeat trials as appropriate

**12.4 process information to:**

- a) assess the accuracy of any measurements and calculations ...
- b) identify and apply appropriate mathematical formulae and concepts
- e) assess the reliability of first-hand ...

**13.1 present information by:**

- b) selecting and using appropriate media to present data and information (eg tables)
- d) using symbols and formulae to express relationships and using appropriate units for physical quantities
- f) selecting and drawing appropriate graphs to convey information and relationships clearly and accurately

**14.1 analyse information to:**

- a) identify trends, patterns and relationships as well as contradictions in data and information

# Practical Assessment Task – Preliminary Course

## Task 1 Average Speed [8 marks]

Equipment has been set up to form two ramps (the angles shown below are exaggerated).



### What to do

For each ramp let the object provided roll down the **complete** distance of the ramp. Measure and record the time taken.

- Write an appropriate aim for this investigation [1 mark]
- In the space below record the results needed **in a table** to calculate the **average speed** the object rolls down each ramp. [5 marks]
- Write a suitable conclusion. [2 marks]

### Aim

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### Conclusion

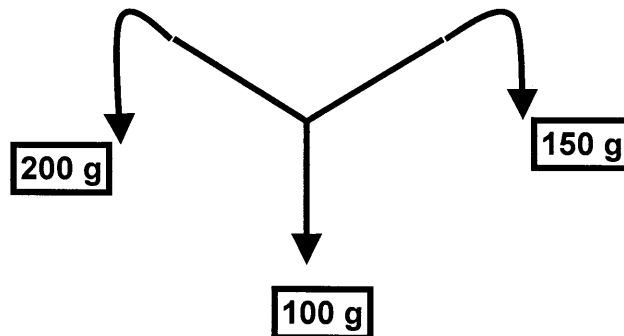
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## Task 2 Vector Addition [First hand investigation]

[7 marks]

A horizontal force board **similar** to the one below has been set up. Pulleys are used to allow different weights attached to each string to exert a force on a common point.



### What to do

- ☺ Use a piece of paper to record the direction in which each force acts.
  - ☺ Use a protractor to measure the angle between each force.
- a. Draw a diagram showing the direction the three forces act on the common point [4 marks]
- ☺ Indicate the scale used
  - ☺ Draw the force vectors to scale
  - ☺ Label vectors correctly
  - ☺ Indicate angles between vectors
- b. Add these vectors graphically in the space below. [3 marks]
- ☺ Diagram should be large and to scale
  - ☺ Include a resultant (stating magnitude and direction with reference to  $F_1$ )

**Task 3 Force, mass, acceleration [2<sup>nd</sup> Hand Data] [10 marks]**

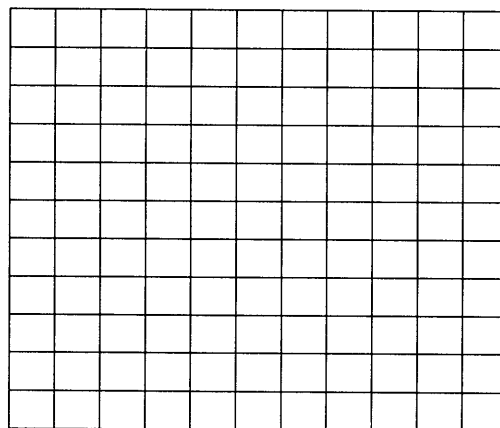
A student set up an experiment to investigate the relationship between force and acceleration. A situation was created such that the acceleration of an object was deliberately changed. The force causing these accelerations was measured.

The results are set out in the table below.

Force (N)	0.0	2.01	4.34	6.31	8.10	10.3
Acceleration (ms <sup>-2</sup> )	0.0	1.50	3.00	4.50	6.00	7.50

For this experiment answer the questions below:

- a. What is the independent variable? \_\_\_\_\_ [1 mark]
- b. What is the dependent variable? \_\_\_\_\_ [1 mark]
- c. Draw a graph of the data. [5 marks]



- d. Identify the relationship between the dependent and independent variable? [1 mark]

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- e. Comment on the reliability of the results. [2 marks]

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### Task 1

8.4.1.i				<b>Marks</b>	<b>5</b>
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<b>Marking Criteria</b>	<b>Part b</b>	<b>Marks</b>
Table used Columns have appropriate heading Convention used such that units written at top of each column (or row) At least three time measurements recorded for each ramp Average speed calculated for each ramp		<b>5</b>

<b>Sample Answer</b> <input type="checkbox"/>
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### Task 2

8.4.2.iii				<b>Marks</b>	<b>4</b>
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<b>Marking Criteria</b>	<b>Part a</b>	<b>Marks</b>
Arrows used to draw vectors Vectors labeled appropriately Scale for diagram indicated Correct angles recorded Magnitude of force vectors drawn to scale		<b>4</b>

<b>Sample Answer</b> <input type="checkbox"/>
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8.4.2.iii				<b>Marks</b>	<b>3</b>
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<b>Marking Criteria</b>	<b>Part b</b>	<b>Marks</b>
Large diagram used Vectors addition demonstrated correctly Resultant vector shown on the diagram		<b>3</b>

<b>Sample Answer</b> <input type="checkbox"/>
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### Task 3

8.4.2.v				<b>Marks</b>	<b>4</b>
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<b>Marking Criteria</b>	<b>Part c</b>	<b>Marks</b>
✓ Axes labeled correctly ✓ Units indicated on each axes ✓ Points plotted correctly ✓ Line of best fit used ✓ Appropriate scale used on each axes		<b>5</b>

<b>Sample Answer</b>
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8.4.2.v				<b>Marks</b>	<b>3</b>
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<b>Marking Criteria</b>	<b>Part e</b>	<b>Marks</b>
Reliability defined		<b>2</b>
Identify that in this investigation acceleration only measured once, and therefore reliability cannot be assured		

**Sample Answer**