PHYSICS – Marking Criteria for Coursework B

			Guide to mark assignment	
Section	**Aims**	**Total Mark**	Investigate the factors that determine the force of friction between a wooden block and the surface on which it is resting.	**H.L.**
Introduction	Clear statement of the problem/topic to be investigated, background research undertaken in preparation for the investigation: people, books, websites, etc. as sources of relevant information.	5	**1 (i) Statement / identification of problem / topic to be investigated:** **1 (ii) Research:** Any reference to book / internet (web) / person consulted etc.	(2) (3)

Preparation and planning	Identification of variables and controls as required
	
	List of equipment needed for the investigation
	
	List of tasks to be carried out during the investigation
		20	**2 (i) Variables / Controls:**
			Note: ***static or limiting friction*** is the maximum force that can be applied without motion occurring and ***dynamic friction*** is the force that will produce movement at constant speed. Accept treatment of either type
			
			Identify ***four*** variables, **two essential** variables and any **two other** variables and/or indicate how some of these need to be controlled or held fixed
			
			Essential variables:
			Weight of block // Contact area // Type of surface (rough, smooth) on which the block rests (moves) // Force applied to move block
			
			Depending on variable student changes, essential variables can become other variables
			
			Other variables:
			Presence or absence of lubricant // same block// same start position // same method to measure force of friction
			
			2 (ii) Equipment needed: Identify any ***five*** pieces of equipment used:
			
			Block(s) // spring balance (force sensors) // String // Weights (more blocks) //
			Meter stick (tape measure) // pulley // elastic strip // hook // Surface(s) on which to pull blocks // Any valid piece of equipment pertinent to procedure (except safety equipment)
			
			2 (iii) List of tasks: Identify any ***three*** tasks carried out in investigation:
			Procure (prepare) block(s) // Set up on surface // Set (vary) factor 1 // Set (vary) factor 2 // Set (vary) factor 3 // Ensure that only the variable under test is varied at a time // zero spring balance // Measure force of friction // Record data // Graph (present)
				(3 + 3)
				
				(2 + 2)
				
				(5 × 1)
				
				(1 + 2 + 2)

Procedure	Procedure, apparatus, safety, data collection/observations ▪ Safety precautions required for this investigation ▪ Procedures followed in the investigation ▪ Recorded data/observations	20	**3 (i) Safety:** Identify any ***two*** **specific** safety precautions followed in conducting the investigation **3 (ii) & (iii) Procedure: <u>State or Show</u>** Identify any ***five*** steps taken in conducting investigation: Mass (weigh) block// block on surface // zero spring balance // attach spring balance (force sensor) to block // attach string to block // pass string over pulley // attach slotted weight set to string // tension elastic fixed amount // pull spring balance (force sensor) to move block at constant speed *or* to a point at which it is just about to move // add weights to string to give same effect // release elastic causing block to move // record force (weight on string), (distance travelled by block) // repeat to verify data // repeat with different weights on block (stack blocks)// area of contact of block with surface // texture of surface on which block moves // repeat procedure to verify second factor // record data // present data (table, graph) **3 (iv) Recorded Data / Observations:** **Factor 1** *versus* **force** **Factor 2** *versus* **force** [Table presentation likely]	(2 + 3) (1 + 1 + 2 + 3 + 3) (2) (3)
Analysis & Conclusions	Analysis ▪ Calculations/data analysis ▪ Conclusion(s) and evaluation of results(s)	20	**4 (i) Calculations / Data analysis:** ***One*** relevant comment analysing data **or** calculation **or** graph Limited manipulation of data **OR** Good manipulation of data **OR** Excellent manipulation of data **4 (ii) Conclusion:** ***One*** relevant conclusion drawn **or** evaluation of results obtained Limited treatment **OR** Good treatment **OR** Excellent treatment	 (4) (7) (10) (4) (7) (10)
Comment	Comments (e.g. refinements, extensions, sources of error etc.)	10	**5** ***One*** comment on **refinement / extension / source of error** reliability of data / how process could be improved / sources of error / possible reason for unexpected result / possible extension of the investigation Limited comprehension **OR** Good comprehension **OR** Excellent comprehension	 (4) (7 (10)

OWN INVESTIGATION – Marking Criteria for Coursework B

Guide to mark assignment				
Section	**Aims**		**Total Mark**	**H.L.**
Introduction	Clear statement of the problem/topic to be investigated, background research undertaken in preparation for the investigation: people, books, websites, etc. as sources of relevant information.	10	**1 (i) Statement / identification of problem / hypothesis statement / topic to be investigated:** (must elaborate on title) **1 (ii) Research:** Any ***two*** references to book / web / person consulted etc (must qualify why this person was a suitable consultant)	(6) (2 × 2)
Preparation and planning	Identification of variables and controls List of equipment needed for the investigation List of tasks to be carried out during the investigation	40	**2 (i) Variables & Controls*:** Identify any ***five*** variables / controls: Must include **two** essential variables with respect to title. Any **three** other relevant variables **2 (ii) Equipment needed:** Identify any ***five*** pieces of equipment used **2 (iii) List of tasks:** Identify any ***three*** tasks carried out in investigation * If variables/controls not relevant to the type of investigation undertaken allow 10 marks for stating so and then readjust equipment to (5 × 3) and tasks to (3 × 5)	 (2 × 4) (3 × 4) (5 × 2) (2 +4 + 4)
Procedure	Procedure, apparatus, safety, data collection/observations ▪ Safety precautions required for this investigation ▪ Procedures followed in the investigation ▪ Recorded data/observations	40	**3 (i) Safety:** Identify any ***two*** safety precautions followed in conducting the investigation **3 (ii) & (iii) Procedure:** State <u>or</u> Show Identify any ***eight*** steps taken in conducting investigation **3 (iv) Recorded Data / Observations:** Identify any ***two*** points related to method used [Table presentation likely]	(2 × 3) (8 × 3) (2 × 5)
Analysis & Conclusions	Analysis ▪ Calculations/data analysis ▪ Conclusion(s) and evaluation of results(s)	40	**4 (i) Calculations / Data analysis:** ***Two*** relevant comments analysing data **or** calculation **or** graph Limited manipulation of data **OR** Good manipulation of data **4 (ii) Conclusion:** ***Two*** relevant conclusions drawn **or** evaluation of results obtained Limited treatment **OR** Good treatment	(7) (10) } × 2 (7) (10) } × 2
Comment	Comments (e.g. refinements, extensions, sources of error etc.)	20	**5** ***Three*** comments on **refinements / extensions / sources of error** e.g. What was learnt* / reliability of data / how process could be improved / sources of error / extension of investigation / possible reason for unexpected result * Other than conclusions already stated	(5 + 5 + 10)