01. 0625_m20_MS_62 Q: 4

	MP1 **circuit diagram:** ammeter in series with resistor and circuit correct	**1**
	MP2 **apparatus:** ammeter and means of measuring candidate's independent variable if other than air speed e.g. (metre) rule if distance is independent variable, protractor if angle of air flow is independent variable	**1**

	MP3 **control variable** (one from): speed of fan (if distance / angle varied) or distance / angle between fan and turbine (if fan speed varied), height of fan / turbine, angle of air flow	**1**
	MP4 **method:** measure / record independent variable (allow turbine to turn and) measure / record current,	**1**
	MP5 repeat for different value of independent variable	**1**
	MP6 **analysis:** compare readings (in a table) to see if change in independent variable produces change in current / plot line graph (with correct axes specified)	**1**
	MP7 **additional point** (one from): at least 5 sets of data taken, repeat each measurement and take average, 2nd valid control variable stated, repeat for different resistor and compare pattern preliminary experiment to determine suitable range for independent variable measure air speed at same point each time	**1**

02. 0625_s20_MS_63 Q: 4

	MP1 **additional apparatus:** voltmeter, protractor, metre rule	**1**
	MP2 **control variable (one from):** distance of lamp from solar panel height of lamp / height of solar panel brightness of lamp	**1**
	MP3 **method (one from):** measure angle between panel and stand / other fixed datum (switch on lamp) measure potential difference	**1**
	MP4 repeat for different angle	**1**
	MP5 **table:** appropriate columns with clear headings and units	**1**
	MP6 **analysis:** suitable analysis of readings, e.g. calculation of rate of change of potential difference with angle draw a suitable graph with correct axes stated	**1**

	MP7 **additional point / precaution (one from):** reading with only ambient light first / subtract ambient light reading make room dark fix protractor keep axis of solar panel and line of lamp perpendicular to each other at least five sets of data taken repeat each reading and take an average repeat for different distance of lamp	**1**

03. 0625_s19_MS_61 Q: 4

	MP1	Apparatus: Forcemeter/Newtonmeter or pulley and weights arrangement	**1**
	MP2	Method: Pull box up slope, measure force and measure distance moved	**1**
	MP3	Method: Repeat with different masses	**1**
	MP4	Variable: Angle of slope or height of blocks	**1**
	MP5	Variable: Distance moved	**1**
	MP6	Table to include columns for mass and force, both with unit (g or kg for mass and N for force)	**1**
	MP7	Calculate work done and compare with mass. OR Compare work done with mass (if there is a work done column in the table). OR Plot graph of work done against mass	**1**

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04. 0625_s19_MS_63 Q: 4

	MP1 Apparatus metre rule / measuring tape	**1**
	MP2 Method drop ball from measured height measure height of bounce repeat for different height of release	**1**
	MP3 Precaution any one from: • repeat (for each height of release) and average • measure to same part of ball each time • measure height of bounce at eye level • release without throwing/impeding • use of video (for height of bounce)	**1**
	MP4 Control variable any one from: • same (diameter/mass/material) ball • type of floor covering	**1**
	MP5 Table columns for release height and bounce height and units	**1**
	MP6 Analysis any one from: • suitable analysis of readings • draw a suitable graph of drop height against bounce height	**1**
	MP7 Additional point any one from: • additional control variable • at least 5 sets of data taken • repeat experiment for different diameter of ball/floor covering • automatic release to eliminate differences	**1**

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05. 0625_m18_MS_62 Q: 4

	MP1	**factor:** clear statement of appropriate variable to test	**1**
	MP2	**control variable:** named variable which should be kept constant	**1**
	MP3	**apparatus:** metre rule and any apparatus essential to variable under test	**1**
	MP4	**method:** measure factor under test and drop ball and measure diameter / depth of depression	**1**
	MP5	repeat for new value of variable under test	**1**
	MP6	**additional point:** repeat experiment or each value of factor and average / means of measuring depth / diameter of crater accurately / apparatus for measuring diameter of ball accurately / measure diameter of ball / crater in different places (and take mean) / smooth / flatten sand surface / at least 5 sets of data taken / reliable means of releasing ball / sensible values for factor quoted	**1**
	MP7	**graph:** diameter / depth of depression vs appropriate continuous variable	**1**

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06. 0625_s15_MS_63 Q: 5

(a) (i) $\theta = 30^{\circ}$ and 65° both to ± 2° [1]

(ii) suitable procedure e.g.: [1]
- use of plumb line
- measure from line of stand
- use of spirit level
- attach protractor behind solar panel

(b) any one reason from: [1]
- ambient light owtte
- zero error on meter

corresponding solution: [1]
- do experiment in complete darkness
- subtract zero reading (from each voltage measurement)

(c) any two aspects relating to apparatus e.g.: [2]
- same distance between panel and lamp
- lamp at same height
- panel at constant height
- same pd across lamp OR same current in lamp OR same brightness of lamp

[Total: 6]

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07. 0625_w15_MS_62 Q: 5

(a) (human) reaction time [1]

(b) ruler or metre rule [1]
repeat for different diameters around the hole [1]

(c) any two from:
- size / mass / weight / volume / diameter / density of ball
- size of the sand grains / type of sand / nature of the sand
- dampness / depth of sand [2]

[Total: 5]

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08. 0625_w15_MS_63 Q: 3

(a) **(i)** correct symbol for variable resistor AND ammeter [1]
correctly shown in series [1]

(ii) any one from: [1]
- distance between fan and blades
- length / area / width of blades / same blades
- direction / height of fan
- height of blades

(b) any two from: [2]
- length of blades
- width of blades
- number of blades
- mass of blades
- pitch / angle of blades
- angle of turbine

[Total: 5]

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09. 0625_w12_MS_63 Q: 5

(a) Discard 53 cm value [1]
Add remaining values together and divide by 4 [1]

(b) 75% [1]

(c) Greater than [1]
Height of release less but bounces to same height (owtte) [1]

[Total: 5]
