

**MARK SCHEME for the May/June 2011 question paper  
for the guidance of teachers**

**5054 PHYSICS**

**5054/42**

Paper 4 (Alternative to Practical), maximum raw mark 30

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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	GCE O LEVEL – May/June 2011	5054	42

1	(a) (i)	two metre rules end to end / measuring tape / one ruler and mark	B1	[1]	
		(ii)	marker on the ramp	B1	
			align with same point on car	B1	[2]
	(iii)	vertical height marked from floor to between lower wheel and top of car	B1	[1]	
	(b) (i)	175.(2) or 1.75(2) seen	C1		
		175 cm or 1.75 m	A1	[2]	
	(ii)	push on release / car does not run straight / uneven ramp or floor / friction varies / wind or draught (varies) / parallax error (in measuring distance)	B1	[1]	
	(c) (i)	axes: labels correct way round, labelled quantity and unit	B1		
		scales: more than $\frac{1}{2}$ grid, sensible	B1		
		y-axis: 2 cm $\equiv$ 20 cm or 25 cm      x-axis: 2 cm $\equiv$ 4 cm or 5 cm			
		points plotted accurately within $\frac{1}{2}$ small square	B1		
		best fit straight line neatly drawn within plotted points	B1	[4]	
	(ii)	$\Delta h \propto \Delta d_{av}$ / as $h$ increases $d$ increases proportionally / $y = mx + c$ as $h$ increases $d$ increases <b>PLUS</b> linear / not through origin / not directly proportional	B1	[1]	
	ecf directly proportional if graph straight line through origin				
(d)	car must be implied in answer				
	does not move / stops before reaching point 2 / moves to bottom of ramp then stops	B1	[1]		
	ecf graph				
			<b>[Total: 13]</b>		
2	(a) (i)	accurate horizontal distance marked from <b>centre</b> of lens to screen	B1	[1]	
		focal length / image distance	B1	[1]	
(b)	repeat and average (measuring distance)	B1			
	any TWO good practical points (may be marked on diagram) e.g.:				
	• adjust screen/lens distance to give clear image				
	• lens in holder				
	• lens and screen perpendicular to ruler / correct use of set square explained				
	• avoid parallax error in reading ruler/measuring $f$				
	• lens/screen close to ruler				
	• experiment in darkened room	B2	[3]		
	allow alternative experiments to measure $f$				
			<b>[Total: 5]</b>		

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
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- 3 (a) parallel B1 [1]
- (b) (i) correct voltmeter symbol drawn across power supply B1 [1]
- (ii) X marked in series with resistor A B1 [1]
- (c) (i) 1.5V cao B1 [1]
- (ii) 0.1(0) A ecf (c)(i) ÷ 15 B1 [1]
- (d) circuit 2 **PLUS**  
two series resistors in parallel loop / no resistor in series with power supply  
owtte / resistance is  $6\frac{2}{3}\Omega$  B1 [1]
- [Total: 6]**
- 4 (a) (same) volume/level/mass of water B1  
any ONE from:
- **initial** temperature (of water)
  - size/shape/material of test tube
  - identical thermometers
  - same external conditions, e.g. room temperature / draught / position in room / humidity B1 [2]
- (b) time or  $t$  / minutes (min) B1  
temperature or  $T$  or  $\theta$  / °C B1 [2]
- (c) both axes labelled **AND** correct shape for one curve (not to x-axis) B1  
A and B similar shape with A initially cooling faster than B, one labelled B1 [2]
- [Total: 6]**