

---

**PHYSICS****5054/41**

Paper 4 Alternative to Practical

**October/November 2016**

MARK SCHEME

Maximum Mark: 30

---

**Published**

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level components and some Cambridge O Level components.

Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2016	5054	41

- 1 (a) correct subtraction 51.3(g) seen B1  
3.664/3.66/3.7 g B1
- (b) any 2  
temperature  
position e.g. in sun  
draughts  
humidity B2
- (c) any sensible apparatus e.g. heater/sun lamp/fan B1

[Total marks: 5]

- 2 (a) car drawn at bottom of ramp B0  
distance  $l$  marked correctly B1  
  
distance  $h$  marked correctly B1
- (b) metre rule/half metre rule/ruler/tape (measure) B1  
accuracy e.g. use of set square to ensure vertical/ avoid parallax error explained B1
- (c) (i) large variation in data for each reading (so this degree of accuracy is enough) B1
- (ii) table completed 123, 153, 188 B2  
one or two correct and to the nearest cm - 1 mark  
all correct more than 3sf – 1 mark
- (iii) axes labelled quantity and unit  
axis labels correct way round B1  
  
scales linear, not awkward, start from (0,0) B1  
  
points plotted accurately B1  
  
best fit curve drawn B1
- (iv) as  $h$  increases  $l_{av}$  increases B1
- (d) range 2.5 to 2.9 (cm) B1

[Total marks: 13]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2016	5054	41

- 3 (a) ammeter in series with correct symbol B1  
voltmeter in parallel with correct symbol B1
- (b) (i) 1.2 A and 8.6 V B1
- (ii) 1125.818... B1  
1100 J/(kg °C) B1
- (c) any 2 sensible suggestions e.g. B2  
aluminium block not lagged/heat loss (to air)  
did not wait for thermometer to reach maximum after power is switched off  
did not ensure heater fully immersed in block  
no oil to improve thermal conductivity with heater or thermometer  
zero errors on meters

[Total marks: 7]

- 4 (a) means of measuring more than one diameter described B1  
measures at least 5 and averages B1  
accuracy detail e.g. use of set squares described/ensure all straws are touching B1
- (b) (Fill straw with water) and use measuring cylinder B1  
accuracy detail e.g. 5 or 10 cm<sup>3</sup> measuring cylinder used B1  
or burette or pipette used  
or repeat and average  
or filling 10/all straws/a number of straws

[Total marks: 5]