



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

TECHNICAL SCIENCES *TEGNIесе WETENSKAPPE*

MARKING GUIDELINES FOR PRACTICAL ASSESSMENT TASKS EXPERIMENT 1/ *NASIENRIGLYNE VIR PRAKTIESE ASSESSERINGSTAKE EKSPERIMENT 1*

**GRADE 12
GRAAD 12**

2020

**These marking guidelines consist of 4 pages.
*Hierdie nasienriglyne bestaan uit 4 bladsye.***

EXPERIMENT 1: THE RELATIONSHIP BETWEEN ACCELERATION AND RESULTANT/NET FORCE FOR A CONSTANT MASS**EKSPERIMENT 1: DIE VERWANTSKAP TUSSEN VERSNELLING EN DIE RESULTANTE/NETTO KRAG VIR 'N KONSTANTE MASSA****/30****1. PRACTICAL SKILLS/PRAKTIESE VAARDIGHEDE**

CRITERIA/KRITERIA	MARKS/PUNTE
Correct setting up of apparatus <i>Korrekte opstel van apparaat</i>	2
Cleaning the runway <i>Skoonmaak van die trolliebaan</i>	1
Raising the runway so that the trolley moves with a constant velocity <i>Oplig van die trolliebaan sodat die trollie met 'n konstante snelheid beweeg</i>	1
Measuring: the length of the runway accurately <i>Meting: die lengte van die trolliebaan akkuraat</i>	1
Measuring: the mass of the trolley <i>Meting: die massa van die trollie</i>	1
Stopwatch used correctly <i>Stophorlosie korrek gebruik</i>	1
Following a sequence of instructions logically <i>Logiese uitvoering van 'n reeks instruksies</i>	1

(8)

2. DATA REPRESENTATION/DATAVOORSTELLING:

1 mass piece/1 massastukkie (10 g) hanging

Trial number/ <i>Eksperiment-nommer</i>	Δx	Mass/Massa (kg)	Time/Tyd (s)	$\Delta v = v_f - v_i$
1	0,65	0,798	4,45	0,146 - 0 = 0,146
2	0,65	0,798	4,50	0,144 - 0 = 0,144
3	0,65	0,798	4,49	0,145 - 0 = 0,145
Average/ Gemiddeld	0,65	0,798	4,48✓	0,145✓

2 mass pieces/2 massastukkies (2 x 10 g) hanging

Trial number/ <i>Eksperiment-nommer</i>	Δx	Mass/Massa (kg)	Time/Tyd (s)	$\Delta v = v_f - v_i$
1	0,65	0,788	2,48	0,262 - 0 = 0,262
2	0,65	0,788	2,45	0,265 - 0 = 0,265
3	0,65	0,788	2,54	0,256 - 0 = 0,256
Average/ Gemiddeld	0,65	0,788	2,49✓	0,261✓

3 mass pieces/3 massastukkies (3 x 10 g) hanging

Trial number/ Eksperiment- nommer	Δx	Mass/Massa (kg)	Time/Tyd (s)	$\Delta v = v_f - v_i$
1	0,65	0,778	1,70	0,382 - 0 = 0,382
2	0,65	0,778	1,78	0,365 - 0 = 0,365
3	0,65	0,778	1,78	0,365 - 0 = 0,365
Average/ Gemiddeld	0,65	0,778	1,75✓	0,371✓

(6)

3. Independent variable: Resultant/Net force✓

Onafhanklike veranderlike: Resultante/Netto krag

(1)

4. To minimise (the effect of) friction. ✓/Om die effek van wrywing te minimaliseer

(1)

5. To keep the mass of the system (mass of the trolley and mass pieces) constant✓

OR

To change the net force applied to the trolley

Om die massa van die stelsel (massa van die trollie en massastukkies) konstant te hou

OF

Om die netto krag wat op die trollie inwerk, te verander

(1)

6.1

$$a = \frac{v_f - v_i}{\Delta t} \checkmark$$

$$= \frac{0,145}{4,48} \checkmark$$

$$= 0,033 \text{ m.s}^{-2}$$

$$F_{net} = ma \checkmark$$

$$= 0,798 \times 0,033$$

$$= 0,026 \text{ N} \checkmark$$

(4)

6.2

$$a = \frac{v_f - v_i}{\Delta t}$$

$$= \frac{0,261}{2,49} \checkmark$$

$$= 0,105 \text{ m.s}^{-2}$$

$$F_{net} = ma$$

$$= 0,788 \times 0,105$$

$$= 0,083 \text{ N} \checkmark$$

(2)

6.3

$$a = \frac{v_f - v_i}{\Delta t}$$

$$= \frac{0,371}{1,75} \checkmark$$

$$= 0,212 \text{ m.s}^{-2}$$

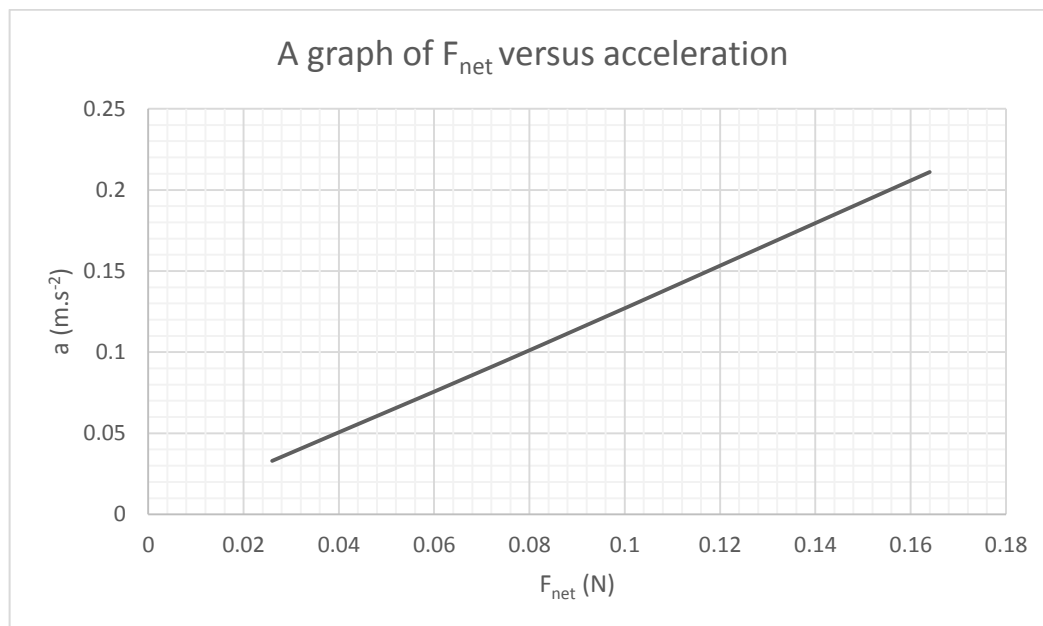
$$F_{net} = ma$$

$$= 0,778 \times 0,212$$

$$= 0,165 \text{ N} \checkmark$$

(2)

7. **Data analysis/Data analise**



MARKING CRITERIA/NASIENKRITERIA	
Axis labelled with correct units/ <i>Asse benoem met korrekte eenhede</i>	✓
3 points plotted/ <i>3 punte geplot</i>	✓
A straight-line graph drawn/ <i>Reguitlyngrafiek geteken</i>	✓

(3)

8. **Conclusion/Gevolgtrekking**

Acceleration is directly proportional to the net/resultant force✓ provided the mass remains constant.✓

Versnelling is direk eweredig aan die netto/resultante krag, mits die massa konstant bly.

(2)
[30]