



**GRADE 9
2005**

COMMON TASK FOR ASSESSMENT (CTA)

NATURAL SCIENCES

TEACHER'S BOOK

MEMORANDUM

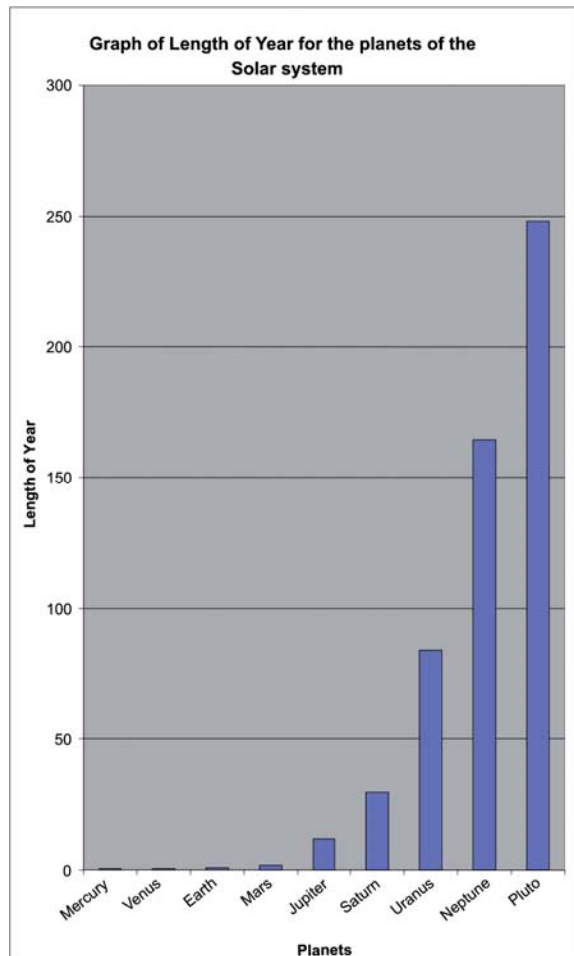
SECTION B

Time : 2 hours

Marks : 80

QUESTION 1 (Specific Outcome 1)

1.1



- ✓ Graph heading
- ✓ x-axis labels
- ✓ x-axis regular intervals
- ✓ y-axis label
- ✓ y-axis scale
- ✓✓ plotted bars

1.2 Pluto ✓

1.3 Mercury; Venus ✓✓

1.4 The time taken to travel around the Sun ✓✓

1.5 The values are compared to the value of that for planet Earth – thus they are ratio rather than an actual value, i.e. Pluto has a year that is 248 times longer than that of Earth. ✓✓

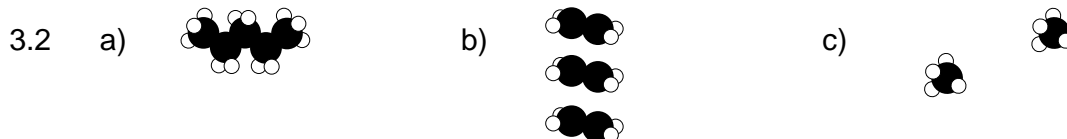
(14 marks)

QUESTION 2 (Specific Outcomes 2 and 5)

- 2.1 Earth is the right distance from the right sort of star ✓
- 2.2 Molten core – provides electromagnetic field for cosmic ray protection ✓
 – causes irregular surface to prevent submergence by oceans ✓
 – provides the atmosphere. ✓
 Contains the right elements in the right proportions – specifically water; oxygen and carbon. ✓
- 2.3 The moon stabilises the spinning of the Earth so that it spins at the right speed and angle. ✓
- 2.4 Venus is too close to the Sun, so it is too hot. ✓
 Venus has a poisonous atmosphere without any oxygen. ✓
- 2.5 Jupiter is too far from the Sun, so it is too cold. ✓
 Jupiter has an atmosphere of hydrogen and helium, with no oxygen. ✓ or
 Jupiter is a gaseous planet without an established solid surface.

(10 marks)**QUESTION 3 (Specific Outcome 2)**

- 3.1 a) C_2H_4 ✓
 b) $2C_2H_6$ ✓
 c) C_8H_{18} ✓



✓

✓

✓

NOTE: the number of each type of atom is important, not the arrangement of atoms in a molecule.

- 3.3 $2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O$
 ✓formula ✓formula ✓formula ✓formula
 ✓✓balancing

(12 marks)

QUESTION 4 (Specific Outcomes 1 and 5 and 8)

- 4.1 The amount of carbon dioxide gas in the atmosphere. ✓✓
- 4.2 The health/movement of the mouse. ✓✓
- 4.3 The movement of the mouse. ✓
- 4.4 The amount of burning/CO₂ production per time unit. ✓
The time periods of measuring. ✓
- 4.5 No. ✓ If it is possible to control the amount of burning, the CO₂ should actually be measured rather than the time. The method of measurement of the health of the mouse using its movement is not precise. ✓✓
- 4.6 E.g. No. The mouse will be asphyxiated and die during the experiment. A mouse is a mammal with a sophisticated nervous system and will undergo suffering. The findings are not essential as similar previous experimental results exist.
✓clear choice made ✓✓relevant and reasonable justification made

(13 marks)**QUESTION 5 (Specific Outcomes 1 and 4 and 5 and 9)**

- 5.1 Nigeria ✓
- 5.2 Australia has a smaller total carbon footprint than South Africa but a much larger per capita footprint ✓. Australia is of greater concern ✓ as the percentage increase is so much greater than that of South Africa.
- 5.3 France has a greater total carbon footprint than South Africa ✓ but a smaller per capita footprint. South Africa is of greater concern ✓ as the percentage increase is greater than that of France.
- 5.4 South Africa could be called a First World country ✓. The per capita CO₂ emission is 8,1 metric tons per person which is similar to that of the First World countries and much higher than the Third World countries ✓.
- 5.5 a) e.g. for a calculate carbon footprint of 218,6 kg:
 Annual emission (tons) = $\frac{\text{Monthly emission (kg)} \times 12 \text{ months}}{1000}$
 = $\frac{218,6 \times 12}{1000}$
 = 2,62 metric tons CO₂ ✓
- b) My carbon footprint is much less than that of the average South African. ✓
- c) This is because domestic production is only 2% of the total production. ✓
Most CO₂ produced in South Africa is due to industries.

(10 marks)

QUESTION 6 (Specific Outcomes 4 and 5 and 9)

- 6.1 a) Travelling could be more sociable – more people to talk to while travelling. ✓✓
- b) Public transport could be more dangerous and could expose people to more crime. ✓✓
- c) Fewer cars on the road would reduce the CO₂ emission and air pollution. ✓✓
- d) If it is not well patronised and many people continue to travel as they do now, it could produce more CO₂ and air pollution per commuter. ✓✓
- e) Yes, a city with as many commuters as Johannesburg needs a mass transit system to reduce CO₂ emission from transport. ✓✓
- 6.2 a) The health of the planet is seriously threatened by the US rejection of the Kyoto Accord. ✓ This is because the USA is a highly industrialised, consumer-driven and populous nation ✓ and is therefore a major producer of CO₂ in the atmosphere ✓.
- b) ✓ clear choice/view expressed ✓ relevant and reasonable justification given

(15 marks)**QUESTION 7 (Specific Outcomes 2 and 3 and 4)**

7.1 No. of kg of CO₂ emitted per month = No. of litres of petrol x Emission Factor

$$= 100\text{l} \times 2,35 \checkmark$$

$$= 235 \text{ kg} \checkmark$$

7.2 Average no. of kg of CO₂ emitted **per learner** per month = $\frac{235 \text{ kg}}{24 \text{ learners}} \checkmark$

$$= 9,8 \text{ kg} \checkmark$$

- 7.3 Yes ✓. The average transport carbon footprint for a learner travelling by car is 90 kg of CO₂ per month. The average transport carbon footprint for a learner travelling by bus is less than 10 kg of CO₂ per month. Thus the reduction in carbon footprint through using the bus is very significant. ✓

(6 marks)