

Year 11 – 2024
MATHEMATICS STANDARD
M EAGLES



Task Number: 2
Weight: 40%

Notification Date: 23/5/2024
Due Date: Thursday 20th June 2024
By handed as a hard copy to Ms Eagles by 3.20pm

OUTCOMES ASSESSED

- MS11-2** represents information in symbolic, graphical and tabular form
- MS11-3** solves problems involving quantity measurement, including accuracy and the choice of relevant units
- MS11-4** performs calculations in relation to two-dimensional and three-dimensional figures
- MS11-5** models relevant financial situations using appropriate tools
- MS11-6** makes predictions about everyday situations based on simple mathematical models
- MS11-9** uses appropriate technology to investigate, organise and interpret information in a range of contexts
- MS11-10** justifies a response to a given problem using appropriate mathematical terminology and/or calculations

TASK DESCRIPTION

- In this task, students need to
- Design and draw a 2-dimensional retreat to scale using recognised symbols and abbreviations on building plans
 - Calculate the cost of running electrical appliances

TASK INSTRUCTION

Scenario: Mum and dad have decided to help you save money that they will allow you to design a teenage retreat that can be placed on the family property for you to live in rent free. You will still be responsible for power and gas bills.

The task instructions and questions can be found on the following pages.

Teacher's signature: _____ Head Teacher's signature _____ DP's signature _____

Part 1 – Design and Drawing the Retreat – 2 dimensional

Students will design and draw a scale drawing of a floor plan for a teenage retreat. It must use the recognised symbols and abbreviations on building plans.

The retreat must have the following attributes:

- Area of 28m²
- Identified sleeping area
- Kitchen or kitchenette
- At least one built-in wardrobe/cupboard
- A wet area that includes toilet, shower and hand basin
- Identified living/study area
- At least one door into the retreat
- At least one window
- Scale drawing

Part 2 – Cost of running electrical appliances

Students will research the costs involved in running electrical appliances and heating in the retreat. The cost of supplying and running hot water will also be determined.

Students need to research three different types of each appliance (for example, 3 different TVs).

Tables to be used for running costs

Domestic Electrical Power	Unit	Excl. GST	Incl. GST
Usage of first 1.021 kWh/day	Cents per kWh	21.21	23.331
Usage of next 1.021 kWh/day	Cents per kWh	20.64	22.704
Remaining usage kWh/day	Cents per kWh	20.52	22.572
Daily supply charge	Cents per day	75.61	83.171

Natural gas usage	Unit	Excl. GST	Incl. GST
First 5500MJ	Cents per MJ	21.21	23.331
Next 13900MJ	Cents per MJ	20.64	22.704
Supply charge	Dollars	\$40	\$44

Question 1

Research **two** televisions. Determine:

- The initial cost
- The running cost in cents per day:
 - On standby
 - In use (Assuming an average 6 hours per day of usage)

Research **two** fridges. Determine:

- The initial cost
- The running cost in cents per day

Attach your research (screenshots and printouts) for each of your products to show purchase cost and energy usage.

Question 2

Research **two gas heaters**. Determine:

- The initial cost
- The running cost in cents per day if used for 8 hours per day

Attach your research (screenshots and printouts) for each of your products to show purchase cost and energy usage.

Question 3

Determine which television, fridge and gas heater you will buy for the retreat and justify your answer for each.

Question 4

Indicate on your plan where you will place the chosen TV, fridge, and gas heater by drawing them to scale.

Attach your research (screenshots and printouts) for each of your products to show actual dimensions.

Question 5

Determine the running cost for the retreat for a year in dollars. The gas heater is only used for 6 months of the year. Show all working.

MARKING GUIDELINES

Part 1 – Design and Drawing the Retreat (10 marks)

Drawing and use of symbols and abbreviations	Question not answered (0)	Draws a layout of the retreat using some recognised symbols and abbreviations. (1-5 marks)	Draws a scale layout of the retreat and uses recognised symbols and abbreviations. There are some errors in scale or symbols/ or abbreviations. (6-9 marks)	Draws a scale drawing of a floor plan for a retreat that has all attributes and uses recognised symbols and abbreviations. (10 marks)
--	---------------------------	--	---	---

Part 2 - Cost of running electrical appliances (20 marks)

Question 1 – TV and Fridge	Question not answered (0)	Indicates the cost of at least one television and/or fridge. Attempts some calculates to determine running costs of at least one television and/or fridge. (1-2 marks)	Research completed on two televisions and fridges. Provides printouts/ screenshots of each product. Provides an initial cost of two televisions and fridges Calculates the running cost of each television and each fridge with minimal errors. (3-5 marks)	Research completed on two televisions and fridges. Provides printouts/screenshots of each product. Provides an initial cost of two televisions and fridges. Correctly calculates the running costs of each television per day based on 6 hours use per day and the remaining time as on standby in cents per day. Correctly calculates the running of each fridge in cents per day. (6 marks)
Question 2 – Gas heater	Question not answered (0)	Indicates the cost of the one at least one gas heater. Attempts some calculates to determine running costs of at least one gas heater. (1 mark)	Research completed on two gas heaters. Provides printouts/screenshots of each product. Provides an initial cost of two gas heaters. Calculates the running costs of each heater per day based on 8 hours use per day with minimal errors. (2 marks)	Research completed on two gas heaters. Provides printouts/screenshots of each product. Provides an initial cost of two gas heaters. Correctly calculates the running costs of each heater per day based on 8 hours use per day. (3 marks)
Question 3 – Product Justification	Question not answered (0)	Provides an outline of why each product was chosen. (1 mark)	Writes a brief justification of why each product was chosen. (2 marks)	Writes a clear justification of why each product was chosen and provides evidence to support their decision (3 marks)
Question 4 – Adding appliances to retreat plan in Part 1	Question not answered (0)	Indicates where each appliance will go on the plan. Not drawn to scale. (1 mark)	Indicates where each appliance will go on the plan. Provides evidence of product dimensions. Some errors in scale. (2 marks)	Indicates where each appliance will go on the plan. Provides evidence of product dimensions. Shows calculations to determine ratio reduction and draws all appliances accurately to scale. (3 marks)
Question 5 – Total Running Costs	Question not answered (0)	Attempts to calculate the running cost for the appliances for at least six month or 180 days. (1-2 mark)	Calculates the total running cost for all appliances for a year. All working is not shown or minor errors in calculations or not converted to dollars. (3-4 marks)	Correctly calculates the total running cost for all appliances and all working for the calculations are shown. Correctly converts the amount into dollars. (5 marks)

Teacher comment

Teacher signature

Date

Task Mark	Task Rank	Cumulative Rank

