Province of the
EASTERN CAPE
EDUCATION

AMATHOLE EAST DISTRICT

GRADE: 7
SUBJECT: NATURAL SCIENCES AND TECHNOLOGY

TERM THREE 2025
MARKING GUIDE

Name: _____

Class: _____ Date: _____

School: _____ Teacher: _____

FAT	Activity / Form	Learner's mark	Learner's %
5.	Practical		
TOTAL		**30**	

Make sure that the layers of newspaper, plastic and fabric are the same thickness so that the thickness of the material does NOT vary in the

ACTIVITY 1

Complete the following table: (4)

This is activity dependent. Exemplar responses.

Time (Minutes)	**Temperature in containers of different materials (ºC)**			
	News paper	Plastic	Aluminium	Fabric
3	78	78	78	78
6	75	72	70	76
9	72	64	65	74
12	70	60	58	72
15	68	58	55	70
Difference	10 ✓	20 ✓	23 ✓	8 ✓

ACTIVITY 2

2.1. Use the following space to draw a line graph for each type of material. You must plot each graph on the same set of axes. First, we need to think about which data is put on each axis.

2.1.1. What will you plot on the horizontal x-axis? This is the independent variable. (1)

Time ✓

2.1.2. What will you plot on the vertical y-axis? This is the dependent variable. (1)

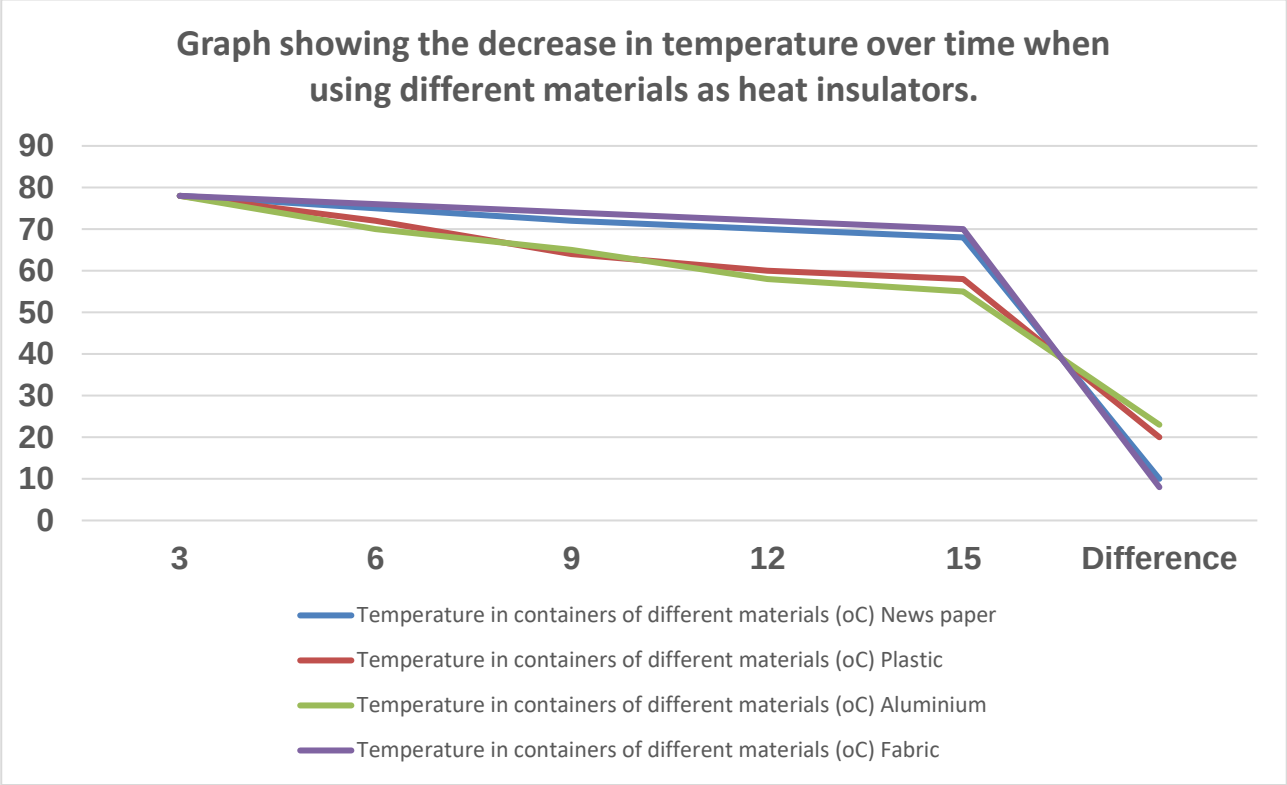
Temperature ✓

2.1.3. How are you going to show a difference between the lines for each type of material on one graph? (2)

Learners can use different colours for each type of material used. ✓✓

NOTE:
The independent variable (time) must be plotted on the horizontal x-axis and the dependent variable (temperature) must be plotted on the vertical y-axis. The learners should plot each of the four graphs one-by-one in a different colour in order to distinguish between the lines. If they cannot use colour then make sure that they label each line carefully. The actual temperature of the water before it starts to cool will affect the results. Also, the ambient temperature of the room will also affect the temperature drop. What is important to notice is that the initial temperature drop is fast but then the rate of temperature drop decreases. This means that the shape of the graph will be a decreasing curve. Learners must provide a heading for the graph, such as "Graph showing the decrease in temperature over time when using different materials as heat insulators."

You can use Assessment Rubric 3 at the back of your Teacher's Guide if you wish to assess this graph.



	DESCRIPTION	MARK	LEARNER'S MARK
Heading	Correct heading of the graph	1	
Vertical axis plotting - labelling	Correct labelling	1	
Horizontal axis - labelling	Correct labelling	1	
Plotting	Three or more points correctly pltted	3	
TOTALS		6	

2.2. Which of your graphs has the steepest curve? (1)

The aluminium foil has the steepest curve. ✓ This might vary though depending on the actual foil and other materials which you used.
NOTE: The answers here must correlate to the learner's results.

2.3. What does the steepness of the curve tell you about how quickly the material allows heat to leave the water? (1)

The steeper the curve the faster the temperature has dropped. ✓ The steep curve shows that heat has left the water quickly.

2.4. Arrange the materials in order from very good insulator to poor insulators of heat. (2)

Fabric, Newspaper, Plastic, Aluminium✓✓

[Allocate marks based on the results in the table]

2.5. Which material was the best conductor of heat? Explain your choice. (2)

This depends on the learner's results. Whichever material allowed the fastest decrease in temperature is the best conductor of heat (Aluminium) ✓ as it means that heat was easily conducted out of the warm water✓.

2.6. Which material was the best insulator of heat? Explain your choice. (2)

Fabric. ✓ The graph with the shallowest curve is the best insulator. ✓ This depends on what the learner's observed during their investigation.

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ACTIVITY 3

3.1. A man is building a wooden house. He lives in a very cold area, especially in winter. He has space for one window. He has two choices. He can put in a large window with a single pane of glass or he can put in a smaller window which has 2 panes of glass separated by a small air space trapped in between them. Which window do you think he should use? Why did you choose that window? (3)

He should use the smaller double-paned window as he needs to prevent heat loss in a cold environment. ✓ The air space slows the heat loss from conduction because the air is a poor conductor of heat✓. Also, the smaller window means that there is a smaller surface area for heat to escape. ✓

3.2. Take away coffee is often served in paper cups with a corrugated cardboard layer on the outside. Why are these materials used? (4)

The coffee is very hot and the energy transfer to the surroundings needs to be reduced so that it stays hotter for longer. ✓ Paper is a poor conductor of heat. ✓ The corrugated cardboard allows a layer of air between the cardboard and the cup✓. Air is a poor conductor of heat. This means that less energy is transferred from the coffee to the person's hand and surroundings. Corrugated also means that there is less area of contact between the person's fingers and the cup. there is therefore less conduction so the person is less likely to burn their fingers. ✓

3.3. How does a thick woollen jersey help to prevent heat loss? (2)

The insulation helps to prevent the transfer of energy to the surroundings by conduction as the insulation material is a poor conductor of heat. ✓✓