



SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE  
SUID-AFRIKAANSE KOMPREENSIEWE ASSESSERINGSINSTITUUT

**Adult Basic Education and Training (ABET)  
Site-Based Assessment  
Portfolio of Evidence**

**Natural Science:** NQF Level 1  
**Total:** 50 marks  
**Duration:** 1 Day  
**Task 1:** Practical Investigation

**Learner Information**

**Name** : \_\_\_\_\_  
**Surname** : \_\_\_\_\_  
**Identity/  
Passport Number** : \_\_\_\_\_  
**Employee Number** : \_\_\_\_\_  
**Company** : \_\_\_\_\_  
**Centre** : \_\_\_\_\_  
**Date** : \_\_\_\_\_

**Declaration**

*I declare that this portfolio of evidence is my own work:* \_\_\_\_\_

**Signature**



**INSTRUCTIONS**

1. This task consists of **TWO SECTIONS**.
2. This practical investigation is based on the theme: **ENERGY AND CHANGE**.
3. The title of the practical investigation: **THE STRENGTH OF MAGNETISM OF AN ELECTROMAGNET**.
4. The task should be completed in **ONE DAY**.
5. The task is divided in **SEVEN PARTS (A to G)**.
  - 5.1 **Parts A – E (SECTION 1)** must be done in groups of **THREE**. You can select a group or be allocated a group.
  - 5.2 **Parts F and G (SECTION 2)** must be completed by learners individually.
6. Write neatly and legibly.



**SECTION 1: GROUP WORK**

Read the case study below for the purpose of this task.

**Electromagnets**

Electricity has many uses, for example, heating and lighting, but it is also used with magnets to make things work. Electric current in a conducting wire creates an electric field around the wire which produces a magnetic field resulting into magnetism. The strength of the magnetism is altered by changing the strength of the current.

*Source: ScienceMatters-EnergyandChange*

**PART A – HYPOTHESIS**

As a group, formulate the hypothesis for your investigation based on the above case study.

Write or note your hypothesis in your note pad(s).

**PART B – AIM**

Write the aim of the investigation and note it on your note pad(s) also.

**PART C – GATHERING OF APPARATUS OR MATERIALS**

- About 1m of insulated copper wire
- 3inch (appr. 7cm) Flat Head Iron Nail
- Two batteries (1,5 V each)
- A few metal money clippers (about 20)
- Masking or insulation tape



**PART D – PROCEDURE AND OBSERVATION**

**INSTRUCTION:** The Facilitator will provide guidance in conducting the investigation. Learners should write down each step followed when conducting the investigation.

1. Expose about 1 cm of copper from either end of the wire.
2. Wind the wire round the iron nail making a coil of 10 turns.
3. Connect the ends of the wire to the terminals of one battery.
4. Pick up as many metal clippers as possible. Record the number of turns and clippers picked up.
5. Disconnect the battery. Connect the two batteries in series and use the tape to hold the batteries together.
6. Connect the ends of the wire to the two terminals of connected batteries.
7. Repeat step 4.
8. Disconnect everything back to its individual items.
9. Wind the wire round the iron nail making a coil of 20 turns.
10. Repeat steps 3 to 7.

**PART E – ANALYZE THE RESULTS AND DRAW THE CONCLUSION**

- After completing all four tests, analyze and compare the strength of magnetism per each test.
- Draw conclusion of the varying results and note the possible reasons thereof.



**SECTION 2: REPORT – INDIVIDUAL WORK****PART F – REPORT WRITING**

Based on the activities of SECTION 1, complete the report below.

1. Write the hypothesis for the investigation. (3)

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2. State the aim of the investigation. (2)

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3. List the apparatus or materials used in the investigation. (5)

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4. Logically outline the procedure followed to conduct the investigation. (6)

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7. Discuss in your conclusion below whether the hypothesis was confirmed or not. Provide reasons of factors affecting the strength of magnetism. (6)

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**Total Marks for Part F**

**[35]**



**PART G - QUESTIONS**

1. Explain what an electromagnet is. (2)

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2. Suggest TWO ways in which an electromagnet can be made stronger. (2)

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3. Explain why an insulated copper wire is used instead of an uninsulated one. (3)

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4. What happened when the batteries were disconnected from the coiled wire in the experiment? (2)

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5. Name an independent variable of the investigation. (2)

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6. Do the batteries produce a direct current (dc) or alternating current (ac)? Explain. (3)

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7. Iron is ferromagnetic. Name ONE other example of ferromagnetic material. (1)

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[15]

**GRAND TOTAL FOR TASK 1**

**[50]**



**Total for Task 1: 50 Marks**

<b>Task</b>	<b>Activity</b>	<b>Maximum Mark</b>	<b>Learner's Mark</b>	<b>Moderated Mark</b>
<b>Task 1</b>	<b>Part F</b>	<b>35</b>		
	<b>Part G</b>	<b>15</b>		
	<b>Total: Task 1</b>	<b>50</b>		

