



education

Department of
Education
FREE STATE PROVINCE

PRACTICAL TASK

GRADE 10

PHYSICAL SCIENCES

JUNE 2018

MARKS: 15

TIME: 30 MINUTES

This paper consists of FOUR pages.

Name of learner:

Grade:

INSTRUCTIONS AND INFORMATION

1. Write your name and grade in the appropriate spaces on the FRONT PAGE of this question paper.
2. Answer ALL questions in the spaces provided in THIS QUESTION PAPER.
3. Give brief motivations, discussions, et cetera where required.

QUESTION 1

A group of five grade 10 learners investigate the magnetic field of a bar magnet. Consider the following list of apparatus labelled **A** to **G**:

A	B	C	D	E	F	G
Iron filings	Copper filings	Test-tube	Bar magnet	Sheet of paper	Tripod stand	Compasses

- 1.1 Write down the LETTERS of the apparatus the learners should use in order to do the investigation. (3)

- 1.2 Consider the following SIX steps the learners follow to do the investigation. The steps are NOT necessarily in the correct order.

1.	Place the compasses at various positions on the sheet of paper near the bar magnet.
2.	Determine the direction of the magnetic field lines.
3.	Tap the paper lightly with your finger until a clear pattern can be observed.
4.	Sprinkle the metal filings evenly over the sheet of paper.
5.	Draw the outlines of the bar magnet and the pattern of the magnetic field lines on the paper.
6.	Place a sheet of paper on top of a bar magnet.

Use the numbers 1 to 6 and write them down in the CORRECT ORDER in which they must be used.

First step

↓

Last step

↓

(2)

- 1.3 Write down a conclusion for this investigation by referring to the direction and strength of the magnetic field of a bar magnet. (2)

The learners carry on and investigate other phenomena of the magnetic fields of bar magnets.

- 1.4 Two bar magnets, 1 and 2, are placed near each other with opposite poles facing each other as shown below:



- 1.4.1 On the diagram above, draw the magnetic field lines BETWEEN the two bar magnets to represent the combined effect of the magnetic field of the two bar magnets. (2)

- 1.4.2 Is the pattern in question 1.4.1 associated with an ATTRACTIVE or REPULSIVE force of magnet 1 on magnet 2? (1)

- 1.5 Bar magnet 2 is replaced by bar magnet 3 as shown below:



- On the diagram above, draw the magnetic field lines BETWEEN the two bar magnets to represent the combined effect of the magnetic field of the two bar magnets. (2)

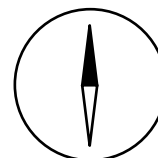
- 1.6 During the investigation bar magnet 1 falls. It breaks in the middle to form two pieces.



How do the magnetic field patterns of the pieces compare with the magnetic field pattern of bar magnet 1? Choose your answer from ONE of the following sentences by putting an **X** in the block of your choice. (1)

- ☐ The magnetic field patterns of both pieces are the same in shape and direction as that of bar magnet 1.
- ☐ After the fall, the smaller pieces have no magnetic fields anymore.
- ☐ Only the piece on the right-hand side has a magnetic field after the fall and it is the same as that of bar magnet 1 in shape and direction.

- 1.7 The learners place a bar magnet (which has a magnetic field) and a compass a considerable distance from each other and they observe that the needle of the compass is not influenced by the magnetic field of the bar magnet. Assume that the compass needle is functioning correctly. Without referring to any effect caused by the distance between the compass and magnet, give a possible reason why the compass needle points in the direction shown below. (2)



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