

2002 年 香港中學會考物理科 (卷一) 問題 6(b) (篇章式參考答案 - 附圖式結構分析)

語體：原理解說

傳意功能：以某個物理學說來解釋某個現象。

圖式結構：指令 ^ 現象確認 ^ 原理陳述 ^ 解說序列 [1-n]

圖式結構	語篇	語言特色
(現象確認)	<p>鋁環會移離螺線管，原因如下：</p>	<p>陳述句「鋁環會移離螺線管」及情態詞「會」複述並確認現象。</p> <p>關係過程「如下」將焦點移至答案的主要部分。</p>
原理陳述	<p>當開關 S 閉合時，螺線管即產生磁場。這一磁場的改變，在鋁環引起感生電動勢和感生電流。</p> <p>根據楞次定律，這感生電流的方向，必使到感生電流的磁場，和引起感應的磁場相抵抗。</p>	<p>從屬時間小句「當開關 S 閉合時」點明現象發生的有關前提條件。</p> <p>位置(空間)環境成份「在鋁環」指出現象發生的位置。</p> <p>物質過程「引起」、「使到」帶出因果關係。</p> <p>角度環境成份「根據楞次定律」引出解釋現象的科學依據。</p> <p>名詞詞組「磁場」、「感生電流」、「感生電動勢」、「感應的」、「南極」、「極</p>

		性」、「斥力」建構學 科知識。
解說序列	該電流的方向會令鋁環靠近螺線管的一端 成為南極，和螺線管 B 端的極性相同。  鋁環受到螺線管的斥力，因而移離螺線管。	情態詞「會」、物質 過程「令」帶出解說 現象發生的原因。  因果連詞「因而」和 物質過程「受到」、 「移離」建立因果關 係並帶出結果。

**2002 HKCEE Physics (Paper I) Question 6(b) (Running answer text – with schematic structure)**

**Genre: Theoretical Explanation**

Communicative function: To introduce and illustrate a theoretical principle and/or to explain events which are counter-intuitive.

Schematic Structure: Direction ^ Phenomenon Identification ^ Statement of Theory ^ Explanation Sequence [1-n]

Schematic Structure	Text	Linguistic Features
(Phenomenon Identification)	When the switch S is closed, the aluminum ring will move away from the solenoid. The explanation for this is as follows.	Declarative mood 'When the switch S is closed, the aluminum ring will move away from the solenoid.' and modal word 'will' restate the phenomenon echoing the question.  Relational process 'is' facilitates further text development.
Statement of Theory	When S is closed, a current is flowing in the solenoid and hence a magnetic field will be built up in it. Due to this change of magnetic field, a current will be induced in the aluminum ring.  By Lenz's law, the induced current flows in a direction such that it produces an effect to oppose the change. So the end of the ring near the solenoid becomes a south pole.	Hypotactic clause 'When S is closed' specifies the condition under which the phenomenon happens.  Circumstance of cause 'Due to this change of magnetic field' and consequential conjunctive relations 'hence', 'So' brings out the

		<p>cause-and-effect relationship that explain the phenomenon.</p> <p>Circumstance of location (place) ‘in the aluminum ring’ specifies the location where the phenomenon happens.</p> <p>Circumstance of angle ‘By Lenz’s law’ foregrounds the theory on which the explanation is based.</p> <p>Nominal groups (noun phrases) ‘magnetic field’, ‘induced current’, ‘south pole’ and ‘repulsive magnetic force’ build subject knowledge.</p> <p>Material process ‘produces’ and relation process ‘becomes’ bring out the effect stated in the theory.</p>
<p>Explanation Sequence</p>	<p>As the end B of the solenoid is equivalent to the south pole of a magnet, the aluminum ring will move away from the solenoid under the action of the repulsive magnetic force between the two south poles.</p>	<p>Causal conjunction ‘as’ brings out the explanation.</p> <p>Modal word ‘will’ provides judgment.</p>

		<p>Circumstance of condition ‘under the action of the repulsive magnetic force between the two south poles’ and material process ‘move away’ bring out the final result.</p>
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## Comparison

- Similarities and differences regarding the question:

### Similarity 1

The ways to provide background information and give directions to students are similar in the Chinese and English texts since they both make use of the declarative mood to impart information. Besides, verbal process ‘解釋’/‘*Explain*’ in imperative mood and the question word ‘為什麼’/‘*why*’ in ‘解釋為甚麼鋁環會移離螺線管’/‘*Explain why the aluminium ring will move away from the solenoid when S is closed*’ are used in both texts to guide students answer the question. The requirement that students have to state and illustrate the theory (Lenz’s law) is not explicitly expressed in the question in both texts.

### Difference 1

Nevertheless, in the Chinese text, material process like ‘把... 套入...’ (insert) in ‘把一個鋁環套入棒中...’ (An aluminum ring is also inserted into the rod), is categorized as ‘Ba-sentence’ (‘把字句’). It emphasizes the objects while there is no such type of construction in English. If the object has to be emphasized, the passive voice is one of the devices that can be used in English as in the counterpart of the above sentence in the English text ‘*An aluminum ring is also inserted into the rod...*’ with the material process in passive form ‘*is inserted*’.

- Similarities and differences regarding the answer:

### Similarity 1

In both texts, a hypotactic clause ‘當開關S 閉合時’/‘*When S is closed*’ is used to introduce the specific the condition under which the phenomenon happens, as in the declarative ‘當開關S 閉合時，螺線管即產生磁場’/‘*When the switch S is closed, the aluminium ring will move away from the solenoid*’. Besides, the use of circumstance of angle ‘根據楞次定律’/‘*By Lenz’s law*’ in both texts introduces the theory on which the explanation is based, as in ‘根據楞次定律，這感生電流的方向，必使到感生電流的磁場，和引起感應的磁場相抵抗’/‘*By Lenz’s law, the induced current flows in a direction such that it produces an effect to oppose the change. So the end of the ring near the solenoid becomes a south pole*’.

### Similarity 2

Cause-and-effect relationship is built by conjunctions/conjunctive relation in both texts. Consequential conjunction ‘因而’ (thus) in the Chinese text and causal conjunction ‘as’ in the English text build logical relationship between the cause

and the effect and bring the texts to an end.

### Difference 1

In the statement of theory, high modality ‘必’ (must) is used in the Chinese text so as to highly affirm the relationship between the theory (Lenz’s law) and the phenomenon mentioned. However, such a high modality is not used in the statement of theory in the English text but more conjunctions/conjunctive relations such as ‘hence’ and ‘so’ are used compared to the statement of theory in the Chinese text in which such conjunctive relations are not used.

### Difference 2

In both texts, the direct cause of the occurrence of the phenomenon given in the question, i.e. ‘*the aluminum ring will move away from the solenoid*’ is illustrated by the physical phenomenon stated in the theory. However, it is brought out by a material process ‘受到’ (endure) and its participant ‘螺線管的斥力’ (the repulsion from the solenoid) in the Chinese text while by a circumstance of condition ‘*under the action of the repulsive magnetic force between the two south poles*’ in the English text.