TEST CODE **01230032**

FORM TP 2008096

MAY/JUNE 2008

CARIBBEAN EXAMINATIONS COUNCIL

SECONDARY EDUCATION CERTIFICATE EXAMINATION

INTEGRATED SCIENCE
(Single-Award)

Paper 03/2

General Proficiency

PRACTICAL PAPER

2 1/2 hours

READ THE FOLLOWING DIRECTIONS CAREFULLY

1. You MUST use this answer booklet when responding to the questions. For EACH question, write your answer in the space indicated and return the answer booklet at the end of the examination.

2. This test consists of TWO questions. You should answer **BOTH** questions.

3. Each question is divided into parts. Each part measures a particular skill. The allocation of marks to the skill within each part is given at the end of that part.

4. **You MUST read ALL instructions completely and carefully before you begin the questions.**

N.B. **Candidates are allowed to have practical notebooks and/or any materials relevant to the practical examination.**

Candidates may be given additional materials without penalty.

If candidates lose time during the examination through no fault of their own, they must be awarded the equivalent time.

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Candidates are required to answer ALL questions.

1. Two pieces of apparatus are provided, one as shown in Figure 1 and the second is similar with a rubber band instead of the spring. You will also be provided with a series of masses (weights): 10 g, 20 g, 30 g ... to 100 g. The elasticity of two materials, a spring and a rubber band are to be compared.

(a) Complete Table 1 by measuring the original length of EACH material, that is, the length without any load attached.

(i) The spring

(ii) The rubber band

(b) Assume that the mass of each material without any load is zero grams (0 g). Complete Table 2 by performing the steps below.

(i) Record the original length of the spring.

(ii) Attach a 10 g mass (weight) to (or place it in) the hanger that is attached to the spring.

(iii) Measure the new length of the spring and record this.

(iv) Calculate the extension of the spring for this 10 g mass (weight) (new length – previous length) and record this.

(v) Remove this mass (weight). Attach the next mass (weight) in the series to (or place it in) the hanger.

(vi) Repeat steps from (ii) to (iv) until all the masses (weights) in the series have been used.

(vii) **Repeat the steps from (i) to (vi) for the hanger attached to the rubber band.**

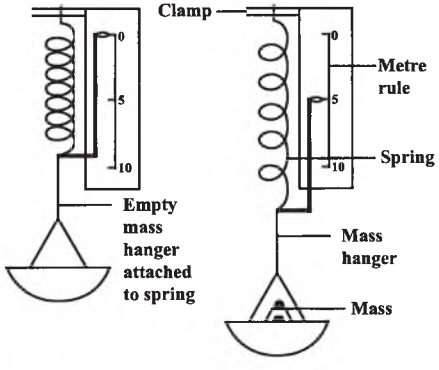


Figure 1. Extension of spring

NOTHING HAS BEEN OMITTED.

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TABLE 1: ORIGINAL LENGTHS OF MATERIALS

Material	Original length/cm
Spring	
Rubber band	

(2 marks)

TABLE 2: EXTENSION DATA

Attached Mass or Load (g)	Spring		Rubber Band	
	Length of Spring (cm)	Extension of Spring (new length – original length of spring) (cm)	Length of Rubber Band (cm)	Extension of Rubber band (new length of rubber band – original length of rubber band) (cm)
0				
10				
20				
30				
40				
50				
60				
70				
80				
90				
100				

(8 marks)

(c) In Figure 2 on page 5, plot, on the **same** axes a line graph of extension against mass/load for

(i) the spring **(5 marks)**

(ii) the rubber band. **(5 marks)**

Note: The mass/load is on the horizontal (x) axis.
Use an appropriate scale for the vertical (y) axis.

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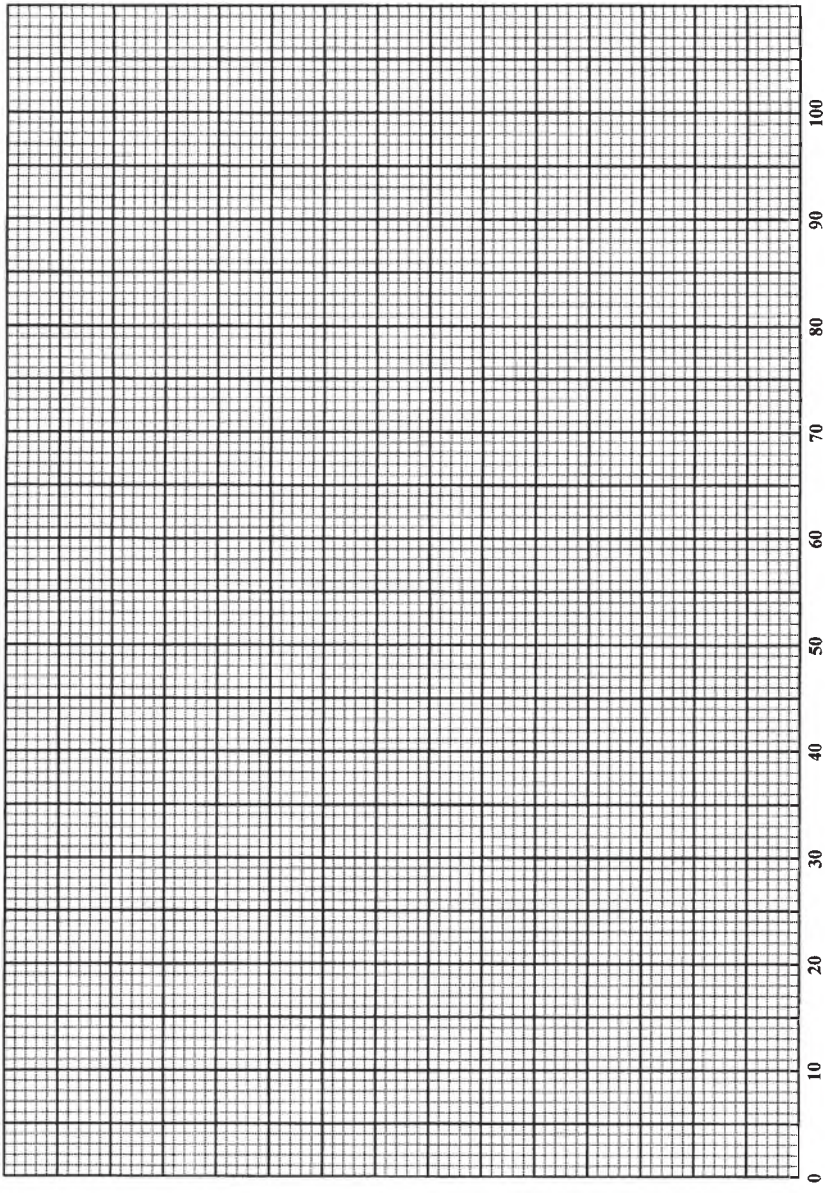


Figure 2.

(d) Label your line graphs and Figure 2 appropriately. **(1 mark**

(e) Extension per gram = greatest extension ÷ greatest load

Calculate the extension per gram for

(i) the spring

(1 mark)

(ii) the rubber band.

(1 mark)

(f) Deduce which material is more elastic.

(1 mark)

(g) Refer to Table 2 and identify ONE dependent variable.

_____

(1 mark)

(h) State the step(s) you would take in order to compare the elasticity of a third material.

_____

_____

_____

(2 marks)

Total 27 marks

2. You are provided with a whole Irish potato (white potato), six strips of Irish potato of different lengths, tap water, brine and a ruler.

(a) (i) Make a large drawing of a whole potato in the space provided in Figure 3.

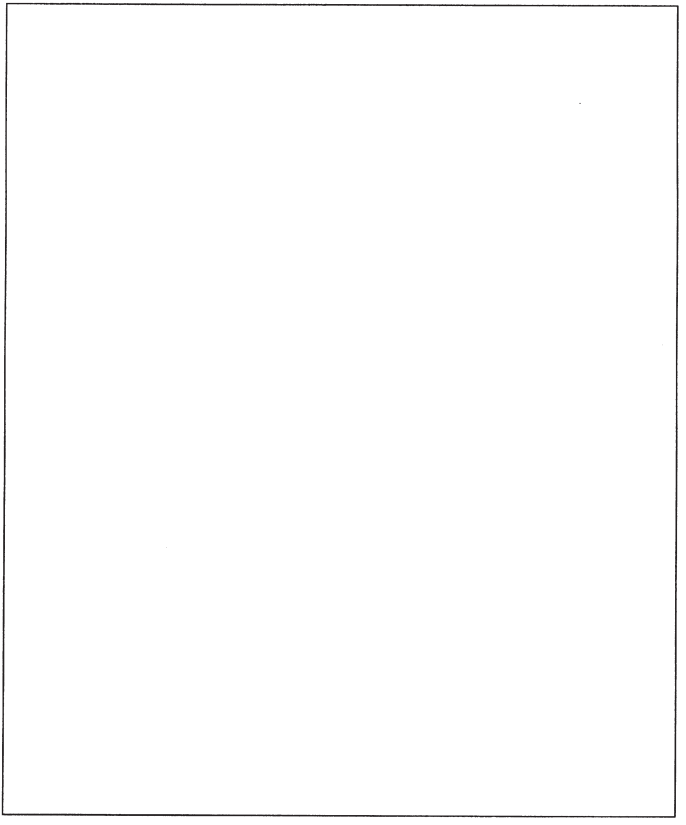


Figure 3 **(3 marks)**

(ii) Write a title for this drawing.

Title _____ **(1 mark)**

(iii) State the magnification.

Magnification: _____ **(1 mark)**

(b) (i) Measure the strips of potato and record your answers in Table 3.

(ii) Place THREE strips of potato (at the same time) in brine for 20 minutes.

(iii) Measure the length of EACH strip after 20 minutes and record the length in Table 3.

(iv) Calculate the change in length after 20 minutes for EACH strip.

(v) Repeat the steps from (ii) to (iv) with tap water.

TABLE 3: COMPARISON OF POTATO STRIPS

Strips	Type of Medium	Length at Start (cm)	Length after 20 Minutes (cm)	Change in Length (cm)
1	Brine			
2	Brine			
3	Brine			
4	Tap water			
5	Tap water			
6	Tap water			

(11 marks)

(c) In the space provided in Figure 4, make a drawing of the actual size of strips 2 and 3 of the potato after 20 minutes.

Figure 4

(2 marks)

(d) What patterns were observed with changes in length and type of medium?

(3 marks)

(e) Explain any observed change(s) in the lengths of the potato strips.

(3 marks)

(f) Which variable was controlled for Strips 1, 2, 3, 4, 5 and 6?

_____

(1 mark)

(g) Identify ONE manipulated variable.

_____

(1 mark)

(h) Suggest ONE reason for using three strips in the same type of medium.

_____

_____

(1 mark)

Total 27 marks

END OF TEST