



EMBURY
INSTITUTE FOR HIGHER EDUCATION

BACHELOR OF EDUCATION IN FOUNDATION PHASE TEACHING

NATURAL SCIENCE AND TECHNOLOGY EDUCATION

NST 301

EXAMINATION

EXAMINER:	M. Gounden	DATE:	June 2018
INTERNAL MODERATOR:	Dr S. Maharajh	DURATION:	2 Hours
		MARKS:	100

GENERAL INSTRUCTIONS:

1. This paper consists of 5 questions and 5 pages.
 2. Write on the paper provided.
 3. Number each question exactly as numbered in the question paper.
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Question 1

[15]

Provide a suitable explanation for each of the following terms below.


- | | | |
|-----|--|-----|
| 1.1 | Inquiry-based learning | (3) |
| 1.2 | Natural Science and Technology is taught as part of Life Skills in Foundation Phase. | (3) |
| 1.3 | Design process | (3) |
| 1.4 | Scientific theories | (3) |
| 1.5 | Observation | (3) |

Question 2**[10]**

Complete the table below which relates to types of forces taught in technology.

Name, describe or illustrate the correct answer next to the question number, i.e. 2.1.

compression force

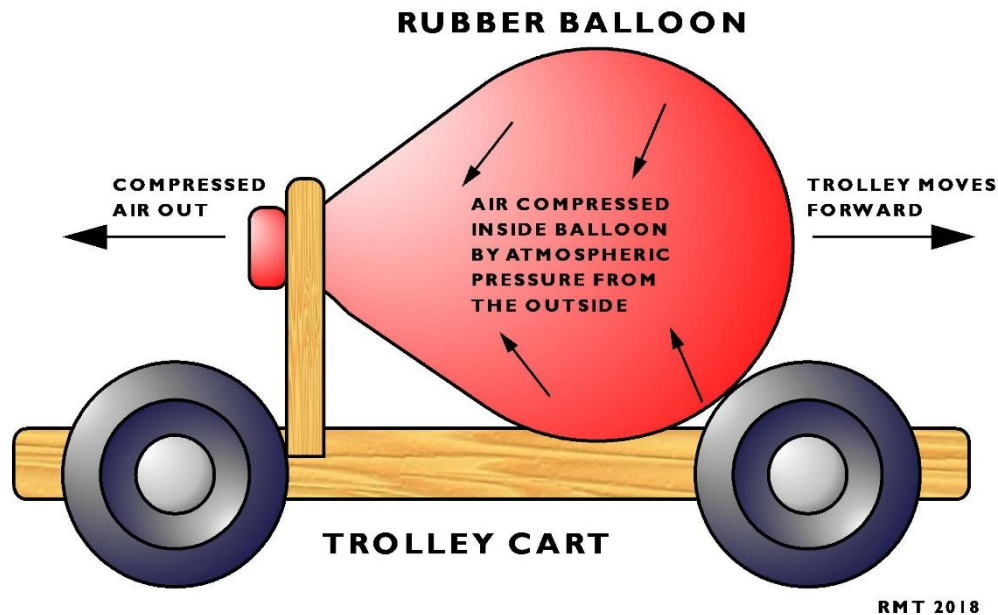
Force	Description	Illustration
Tension	2.1	2.2
2.3	A tearing/ breaking force	2.4
2.5	2.6	
2.7	A force which causes a deflection in a beam or cantilever. A combination of tension and compression.	2.8
Torsion	2.9	2.10

Question 3

[30]

Study the following experiments and complete the questions relating to each one.

3.1 Experiment 1 – Balloon powered car

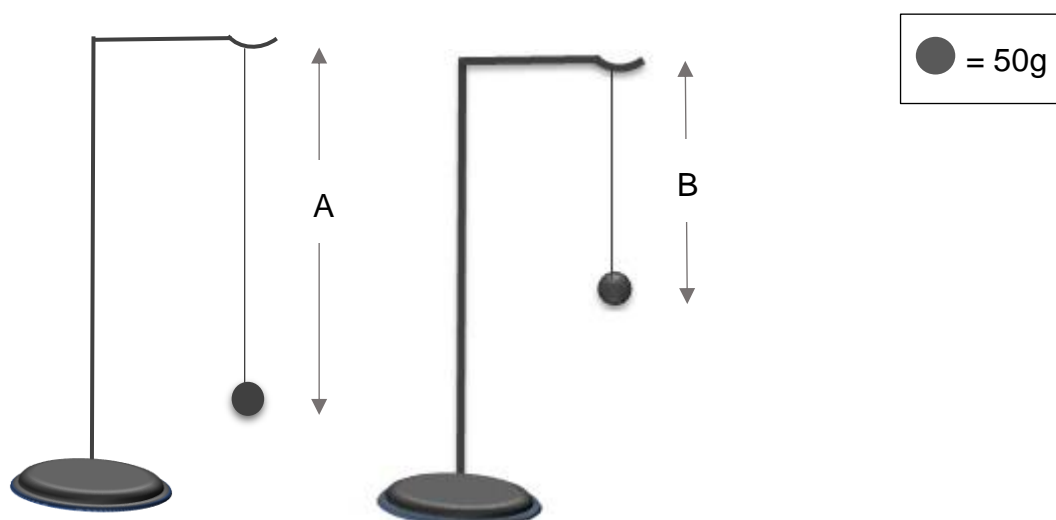


3.1.1. What is the objective of Experiment 1? (2)

3.1.2. Identify four variables associated with the experiment. (4)

3.1.3. Discuss an alternative experiment that learners could construct to explore the concepts illustrated in Experiment 1. (4)

3.2 Experiment 2 - Pendulum



Morphart, D. n.d. Cansport 7146454 [online]. Available from: <http://www.canstockphoto.com/electric-pendulum-vintage-engraving-7146454.html> [Accessed on 22nd April 2015].

- 3.2.1. Name the independent variable. (1)
- 3.2.2. Name the dependent variable. (1)
- 3.2.3. Construct a data table where learners could record their observations for Experiment 2. (8)

3.3 Experiment 3 – Meteorite craters

Grade three learners are investigating meteorite craters on the Earth's surface. Their teacher provides them with a plastic tray filled with sand, a marble and a meter ruler. Their objective is to investigate if there is a relation between the height an object is dropped from and the depth of the crater it forms.

Data table for the moon crater investigation:

Height of drop (cm):	Depth of crater (mm)
20	3
30	4.5
40	7

- 3.3.1. Draw an appropriate graph or bar chart of the data collected in the above table from Experiment 3. (10)

Question 4 [20]

Your school's principal has approached you to present a Natural Science and Technology (NST) workshop for your colleagues regarding the Foundation Phase curriculum. Plan a presentation in the form of a slideshow (with headings and key points listed). Use the following topics as headings in your presentation:

- Integration of NST concepts and skills into the Foundation Phase curriculum (5)
- Cross-curricular NST activities in the classroom (5)
- Safety considerations to follow (5)
- Assessment programme according to CAPS (5)

Question 5**[25]**

A Grade Three teacher sets up a display table in her class around the theme 'Public Transport'.

- 5.1 Name three items the teacher could put on display and explain how these items could be used to encourage the learners to develop their problem identification skills as part of the Design Process. (6)
- 5.2 Design an integrated Natural Science and Technology lesson where Grade Three learners working in small groups learn about inclined plane mechanisms and gravity by observing and recording wheeled vehicles behaviour rolling down a ramp. (15)
- Discuss the introduction and the development of the lesson where learners would test the concept using the Technology design process. Include sketches of resources used to make the lesson interactive and practical for the learners. Discuss the method of collecting data and what independent variables are being observed/recorded. Discuss how the lesson will be concluded.
- 5.3 Identify two independent variables that could be observed or tested as part of the lesson in Question 5.2. (2)
- 5.4 Suggest how this experiment could be extended into a more advanced design project which focusses on adapting the vehicle and observing how it performs on the inclined plane. (2)

TOTAL: 100