

Contents

Introduction	v
Science Introduction	vi
Dimensions	
Science Knowledge and Understanding	
Science at work	
Safety	ix
Level 4	x
Learning Focus	
Standards	
Progression Points: Progressing towards Level 4	xii
Year Planner	xiii
Term 1 Planner: Earth and Space	xiv
Term 2 Planner: Living Things	xv
Term 3 Planner: Matter	xvi
Term 4 Planner: Forces and Motion	xvii
Using the Lesson Plans	1
Term 1: Working Scientifically	
Science	2
Scientists	4
Gearing up for Science.....	6
Famous Scientists	8
Earth and Space	
Layers of the Earth	10
The Atmosphere	12
Natural Disasters	14
Mountains	16
The Solar System	18
Planet Comparisons	20
Term 2: Forces and Motion	
Simple Machines	22
Levers	24
Inclined Planes 1	26
Inclined Planes 2	28
Wheels & Axles	30
Gears	32
Pulleys	34
Mechanical Advantage.....	36
Design, Investigation, Production, Evaluation	38
Term 3: Matter	
Conduction, Convection & Radiation	40
Conductors	42
Metals as Conductors	44
Keeping Heat in & Keeping Heat out.....	46
Food – Keeping Heat in & Keeping Heat out	48
Investigating a Thermos	50
Gold	52
Experimenting with Gold	54

Physical & Chemical Changes	56
Burning is a Chemical Change	58
Term 4: Living Things	
Relationships within Habitats	60
Threats to Food Chains	62
Animal Migration	64
Senses for Survival	66
Plants – Nutrient Transport	68
Xylem Vessels.....	70
Leaves	72
Plant Propagation.....	74
Pollinators	76
Appendices	
Appendix I: Assessment Record Sheets	78
Appendix II: Teaching Aids	112

Introduction

In this teaching resource you will find a year planner, term planners and week-by-week lesson plans, as well as corresponding assessment record sheets, teaching aids and reward certificates. Each week-by-week lesson plan lists students' objectives, teaching resources, skills, step-by-step activities, assessment suggestions and a list of associated terms. Some lesson plans include extension activities.

Each lesson plan is designed to be used in conjunction with the student workbook and the appendices (see the back of this book). Flick through the lesson plans and you will notice that each time a work sheet, homework sheet, assessment record sheet or other resource is required, its page number is referenced. Thus the week-by-week lesson plans form the skeleton for all your science lessons.

In the appendices at the back of this book you will find assessment record sheets (Appendix I) and reproducible teaching aids (Appendix II). The activities in the lesson plans utilise materials that are fun and inventive yet easily found around the classroom or at home. 'Technology Application' indicates how technology is integrated into the classroom. The activities can be taught in one block or individually throughout the week.

The student workbook encourages active student participation and helps develop a wide range of skills from discussing and analysing to hypothesising and cooperating. The workbook also serves as a record of each student's observations and an outline of how each student's scientific knowledge has developed.

Use this book, *VELS Science Teaching and Assessment Resource – Year 6*, in conjunction with the student workbook. It will make teaching easier by providing the resources for the VELS standards for Science, Level 4, in an easy-to-use format.

INVESTIGATING A THERMOS

OBJECTIVES

- Investigate how a thermos works

RESOURCES

a variety of thermos flasks
a poster showing a cross-section of a thermos
four tins per group (all the same size)
four smaller tins per group (to fit inside the first four tins)
insulating substances, such as newspapers

cotton wool
towelling
steel wool
fabric
data loggers with temperature probes

SKILLS

observing
predicting
investigating

data gathering
analysing

TECHNOLOGY APPLICATION

using data-logging equipment to investigate insulation

PROGRESSION POINTS

The following lesson provides opportunities for students to demonstrate:

Progression Point 3.5 Science at work

- Comparison of how people in a wide range of occupations and cultures use science in their work and leisure

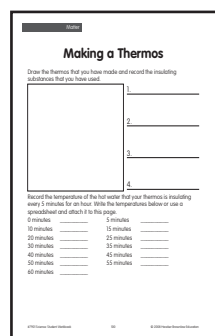
Progression Point 3.75 Science knowledge and understanding

- Knowledge of the consequences of change in terms of cause and effect applied in chemical, physical, biological, earth and/or space science contexts
- Knowledge of the connections between concepts related to one or more of matter, space, energy and time, and application of these concepts in everyday contexts
- Understanding of how a system and/or its components adapt to change

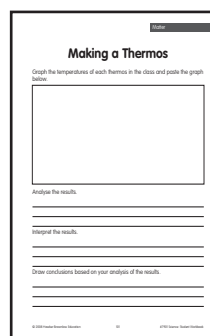
Progression Point 3.75 Science at work

- Design and reporting of experiments, including statements of purpose, labelled diagrams and symbols that explain procedures, and justification for the type of data gathered and equipment used
- Systematic collection and analysis of data, including valid conclusions and identification of relationships between variables
- Application of safe and ethical procedures, including risk management plans for handling of equipment and materials
- Design and construction of a simple model, including annotations, that illustrates understanding of a scientific concept
- Knowledge of additional sustainable practices which could be undertaken at home and in the local environment

CORRESPONDING WORK SHEETS



100



101

ACTIVITIES

- Give pairs of students a thermos to investigate. Have them closely examine it, noting the substances used.
- Make explicit that a thermos is designed so heat cannot easily get in or out. Tell students that two thin walls of mirror glass are used and that there is a vacuum between the walls. The outer shell is usually made of plastic or metal. Discuss the concept of a vacuum with the students.

Vacuum – a space entirely void of matter. An enclosed space from which air and all other gases have been removed.

- Tell students that they will be making thermoses. Provide small groups with eight tins, four of one size and four smaller. The small tins must be able to fit inside larger tins. Have students place each of the smaller tins into one of the larger tins, then surround three of the smaller tins with an insulating substance. Tell them to leave one set without insulation. Have students draw the thermoses they have made and record the insulating materials they have used in their workbooks.
- Have groups place equal amounts of hot water into the smaller tins and record the temperature of each one using data-logging equipment. Have them seal both tins in each pair, and record the temperature of the water in their workbooks every five minutes for an hour.
- Have students graph the results in their workbooks (or print electronic graphs and paste them in), then interpret the graph, record an analysis and draw conclusions based on the results.

Have students repeat the above using glass jars and compare the insulating properties of glass to tin. Discuss fair testing in relation to size of containers and so on.

EXTENSION

Are students able to identify substances to prevent heat loss or gain? Can students explain how a thermos works? Can they explain what insulation means? Record responses on the assessment record sheet provided (see page 99).

ASSESSMENT

LANGUAGE

Introduce and explain the following terms:

thermos
design
designed
glass
container

vacuum
flask
mirror
shell