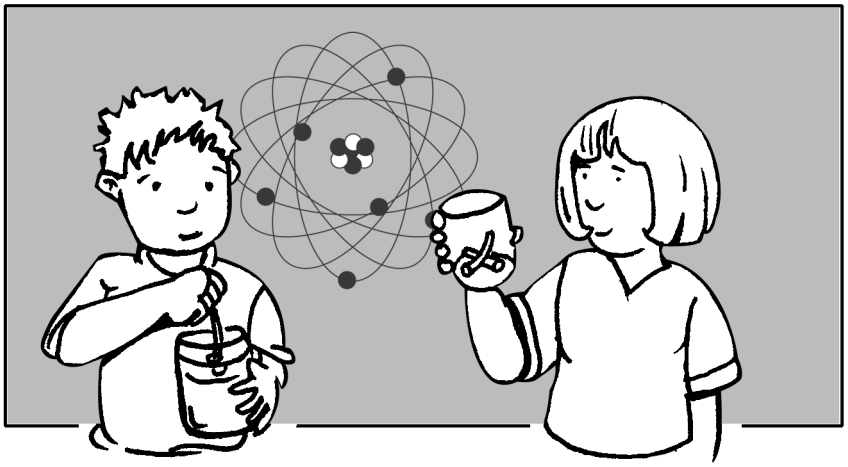
Science

VELS Teaching & Assessment Resource
Year 1
Level 2



TEACHER RESOURCE

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EDUCATION

Contents

Introduction

In this teaching resource you will find a year planner, term planners, week-by-week lesson plans, as well as corresponding assessment record sheets, reproducible teaching aids and homework sheets. 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 week-by-week 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 week-by-week 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 student 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, *Science VELS Teaching and Assessment Resource – Year 1, Level 2*, in conjunction with the student workbook. It will make teaching easier by providing the resources for the VELS standards for Science, Level 2, in an easy-to-use format.

Science Introduction

To be human is to be curious about the world we live in, to wonder why it is that way, and to ask about our place in it. A fundamental goal for science education is to stimulate, respond to and nourish such curiosity, wonder and questioning. Science provides us with one view of the world – a view that changes as our knowledge and understanding of science evolves.

Science is a human process, influenced by and influencing social values. Science has a long and fascinating history of human attempts to appreciate, understand, control and manage our world. Scientists use techniques of scientific investigation to create an understanding of the world. The resulting cumulative knowledge is part of our human heritage.

Science is dynamic and progressive. Our society is being continually confronted, challenged and redirected by ideas borne from people's curiosity, imagination and dreams about what might be possible. The work of scientists such as Newton, Einstein, Curie, Darwin, Florey, Macfarlane Burnet and Oliphant began as 'why' and 'what if'. Their work challenged and subsequently changed accepted opinions in the areas of motion and gravity, radioactivity, evolution, medicine, immunology, structure of the nucleus of the atom, and nuclear energy. This and other accepted science knowledge continues to fuel the dreams of a new generation of scientists as they explore the expanding frontiers of science.

Science has had, and will continue to have, successes and setbacks as technologies that provide people with an improved quality of life are developed and implemented.

It is becoming increasingly important that students understand these challenges and redirections, and the implications of these for their own life choices, the environment and the community (local and global) in which they live. Building students' science capability is critical to help them develop the skills and understanding necessary to meet these challenges and make responsible, informed choices.

Science extends our understanding beyond what affects us to include what we can't see, feel, hear or touch but can only imagine. Science capability is multidimensional, consisting of dispositional facets (interest and curiosity), operational facets (creativity and problem solving) and cognitive facets (reasoning and critical thinking). The extent to which we as citizens understand and appreciate these interactions will shape our future.

A set of values inform and govern how scientists operate including respect for the environment (living and non-living) and the opinions and ideas of others, honesty in collecting and presenting data and evidence, and acknowledgment of the work of others. These values are an integral part of a science curriculum that explores and encourages debate about the relationship between science, society and technology.

A major goal of science education is to develop citizens who are capable of engaging in informed debate about science and its applications. Increasing emphasis will be placed on the role of science and the work of Australian and other scientists in addressing issues of sustainability at a local and global level. Science education provides opportunities for students to develop the skills and understanding appropriate to service and good citizenship. It also encourages students to articulate science values and accept the ethical principles embedded in science research. While only some students directly pursue a career in science and scientific research, all students need to appreciate the significance of science for the long-term future of our society.

Dimensions

Standards in the Science domain are organised in two dimensions:

- Science knowledge and understanding
- Science at work.

Science Knowledge and Understanding

The Science knowledge and understanding dimension focuses on building student understanding of the overarching conceptual ideas of science. These include understanding:

- the nature of the similarities between, and the diversity of, living things and their sustainable relationships with each other and their environment
- concepts related to matter – its properties and uses, and the production of different substances through chemical change
- concepts of energy and force as a way of explaining physical phenomena
- the place of the Earth in time and space and the interactions between the Earth and its atmosphere
- how scale is important in relating structure to function at microscopic and macroscopic levels.

These understandings enable students to build on their curiosity and answer their own questions about themselves and their interactions with the world while at the same time allowing them to think through contemporary challenges and issues. Through this, students come to understand how science relates to society and the environment.

There are NO standards for Level 2 for Science Knowledge and Understanding.

Science at Work

The Science at work dimension focuses on students experiencing and researching how people work with and through science. Students learn to be curious and to use scientific understanding and processes to find answers to their questions. They design and pursue investigations ethically and safely; generate, validate and critique evidence; analyse and interpret ideas and link them with existing understanding; work and reason with scientific models and communicate their findings and ideas to others. They identify and practise the underlying values, skills and attributes of science.

Through their investigations, they gain insight into science as a human activity and the relationship between science, technology and society both now and in the future. They explore how science is used in multiple contexts throughout their lives and its pervasiveness throughout the workplace.

Each lesson makes reference to the early development of those skills and behaviours mentioned under 'Science at work'. They are very general, as there are NO standards for Level 2 for Science at work.

Level 2

Learning Focus

As students work towards the achievement of Level 3 standards in Science, they observe and describe phenomena; for example, properties of natural and manufactured materials, insect life cycles, phases of the moon, magnets in action, mirrors and seeing around corners, and light and sound from batteries. Students expand their simple scientific vocabulary by using words and terms for concepts such as temperature, life cycles, light and reflection, sound, magnetism and fair testing.

Students begin to generate questions about situations and phenomena, and suggest forms of observations and measurements that are appropriate for the investigation of their questions; for example, 'Which keeps food fresher, paper or plastic?' and 'What makes sounds change?' They continue to practise basic procedures and processes, including those involving safety. They investigate ways of reducing waste in their classroom; for example, recycling and composting.

They repeat observations over time to make predictions; for example, collecting data about the weather. They begin to recognise simple patterns in data and describe them in terms that represent conclusions drawn from the data. Suitable questions may include: 'Does the size of seeds affect the time taken for them to germinate?', 'Does all chocolate melt at the same temperature?' and 'Are shadows the same size?'

National Statements of Learning

This learning focus statement incorporates aspects of the Year 3 National Statement of Learning for Science.

Standards

In Science, standards for assessing and reporting on student achievement are introduced at Level 3. The learning focus statements for Levels 1 and 2 provide advice about learning experiences that will assist students to work towards the achievement of the standards at Level 3.

Year Planner

Week	Term 1 Earth & Space	Term 2 Living Things	Term 3 Matter	Term 4 Forces and Motion
1	What is a Scientist? Observing the Weather 1	Human Families	Everyday Substances	Battery Power
2	Observing the Weather 2	Animal Families	Exploring Substances: Properties and Suitability	Magnetism
3	Observing the Weather 3	Life Cycles of Frogs and Butterflies	Exploring Substances: Properties and Uses	Magnets
4	Observing the Weather 4	The Life Cycle of a Plant	Comparing Substances 1	Strength of Magnets
5	Seasons	Caring for Young	Comparing Substances 2	Force and Movement
6	Weather Conditions 1	Animal Shelter	Testing Properties of Substances	Floating and Sinking
7	Weather Conditions 2	Animals and Food	Substances Can Be Changed	Sound 1
8	Minerals from the Earth	Protection	Making New Substances	Sound 2
9	The Earth	Living Things Depend on Each Other	Heating Substances	Light 1
10	The Moon and the Stars	Body Structures of Animals	Dissolving Substances	Light 2

OBSERVING THE WEATHER 1

OBJECTIVES

- Observe the weather regularly
- Make recordings of the weather on a regular basis
- Be engaged in discussions about the seasons

RESOURCES

newspapers with the weather report
datalogger with temperature probe
Excel

SKILLS

observing
recording

TECHNOLOGY APPLICATION

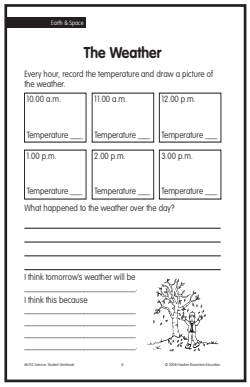
datalogging

SCIENCE AT WORK

Although there is no standard at Level 2 for Science at Work, during this lesson the students will begin to develop the following skills and behaviours that are reflected in Science at Work dimension:

- Learning to be curious
- Experiencing and researching how people work with and through science
- Using scientific understanding and processes to find answers to their questions
- Designing and pursuing investigations safely
- Generate, validate and critique evidence
- Analyse and interpret ideas and link them with existing understandings
- Communicate findings and ideas with others

CORRESPONDING WORK SHEETS


Earth & Space

The Weather

Every hour, record the temperature and draw a picture of the weather.

10.00 a.m. Temperature ___ | 11.00 a.m. Temperature ___ | 12.00 p.m. Temperature ___

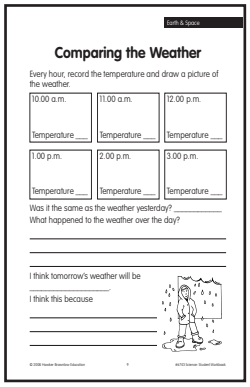
1.00 p.m. Temperature ___ | 2.00 p.m. Temperature ___ | 3.00 p.m. Temperature ___

What happened to the weather over the day?

I think tomorrow's weather will be

I think this because

8


Earth & Space

Comparing the Weather

Every hour, record the temperature and draw a picture of the weather.

10.00 a.m. Temperature ___ | 11.00 a.m. Temperature ___ | 12.00 p.m. Temperature ___

1.00 p.m. Temperature ___ | 2.00 p.m. Temperature ___ | 3.00 p.m. Temperature ___

Was it the same as the weather yesterday? _____

What happened to the weather over the day?

I think tomorrow's weather will be

I think this because

9

ACTIVITIES

- Write the word *weather* on the board. Ask the students to tell you anything they know about the weather. Write key words and draw pictures next to them as the students share what they know.
- Go outside and observe the weather. Ask the students how they would describe what they are observing and what they would draw to illustrate what they see. Use a datalogger to record the temperature (optional).
- Question the students by asking such things as:
  - 'Will the weather be the same as it is now at the same time tomorrow? Why/why not?'
  - 'Will the weather be the same in two hours?' Probe them thoroughly to gain an understanding of what their beliefs and understandings are in relation to the weather. This may lead to a discussion on the seasons and seasonal changes.
- Tell the students that you are going to observe the weather every hour all day. Ask them to predict what they think will happen.
- Use a datalogger to record the temperature. Students are to record their observations in their workbooks.
- Ask students to write about what changes they observed over the day and add any new weather words to the list.
- Record the weather at the same time the following day. Before doing so, ask the students if they think it will be the same and to explain their reasons. Tell the students that they will be observing the weather at the same time each day for a week.
- As a homework task, ask the students to record the top temperature and the overnight low for one week. (See Appendix, page 135, for the homework sheet.)
- As a class, cut out the weather report from the newspaper.
- Compare the television news weather reports to the newspaper weather reports and the students' own reports. What are the similarities and differences? Why did they occur?

ASSESSMENT

- Write anecdotal comments on the student workbook, noting student behaviours when making observations

LANGUAGE

Introduce and explain the following terms:

weather	*heat*	*blow*
sun	*mist*	*blowing*
sunshine	*misty*	*blew*
sunny	*fog*	*dry*
wind	*foggy*	*drier*
windy	*cloud*	*driest*
rain	*cloudy*	*humid*
rainy	*warm*	*humidity*
hail	*warmer*	*hailing*
warmest	*drizzle*	*wet*
drizzling	*wetter*	*hot*
wettest	*hotter*	*storm*
hottest	*stormy*	