**Lesson 4  Mixtures and substances — Investigating mixtures and substances**

**Lesson concepts**
- Mixtures are a combination of pure substances
- Experiments are collaboratively conducted ensuring safety guidelines are followed
- Equipment is selected to collect data with appropriate accuracy
- Ideas and findings are communicated using scientific language and representations

**Example learning sequence**

**Discuss water**
- Discuss catchments as per previous lesson
- River flow story example of pollution added
- Discuss how water is found naturally as a mixture with many dissolved substances in it including minerals and gases.
- Discuss how water is a mixture in relation to drinking water.
- Explain how water can be purified by removing the dissolved substances.

**Define solubility (1/2 group)**
- Review the concept of dissolving as a process.
- Clarify terms relating to dissolving such as solvent, solute and solution.
- View an example of solubility.

**Explore mixtures and substances (1/2 group)**
- Define pure substances.
- Define mixtures.
- Explore types of mixtures.
- Communicate findings from explorations.

**Explore everyday mixtures and substances**
- Make suggestions about substances, mixtures and solutions used in everyday life.
- How can mixtures effect the reef through river pollution

**Extension Activity**
- Snorkel on a degraded reef then on a healthy one
- Identify the effect of mixtures within saltwater affecting reef quality

**Example resources**
River flow story – Fitzroy River


**Materials and equipment list**
- Sheet — Solubility fair test
- Sheet — Mixtures procedures

**Safety**
a solution mixture?

Ideas for monitoring

Monitor students’ ability to:
- understand solubility, mixtures and substances.

Learning alerts

Be aware of:
- students who think that solutes disappear when they dissolve
- students who think that a mixture always has a liquid component
- students stating that mixtures are always multi-coloured.

Suggested next steps for learning

Clarify with students that solutes are always present in a solution, but are too small to be seen.

Inform students that mixtures can be made of any combination of solids, liquids or gases.

Remind students that mixtures may be of any colour or colourless.

Ideas for differentiation

Support

Provide hands-on activities for students to further explore substances and the concept of dissolving.

Extension

Allow students to elaborate on different types of mixtures by exploring colloids and suspensions.

Teachers need to:
- identify safety issues relevant to the practical activities and conduct risk assessments relating to mixing substances
- refer to Workplace health and safety (WHS) policy pertaining to schools.

Australian Curriculum references for this lesson

Year 7 Science — Content descriptions

Science Understanding

Chemical Sciences
Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques

Science Inquiry Skills

Planning and conducting
Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed

In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task

Communicating
Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate

View a mapping of the Science Content descriptions for this unit
View a mapping of the Science Content descriptions for this year level

General capabilities

Literacy
- Comprehending texts through listening, viewing and reading
- Composing texts through speaking, writing and creating
  - Text knowledge
  - Work knowledge
  - Visual knowledge

Numeracy
- Interpreting and drawing conclusions from statistical information

ICT capability

Queensland Student ICT Expectations:
- Operating with ICT

Australian Curriculum ICT learning continuum:
- Managing and operating ICT

Critical and creative thinking
- Inquiring — identifying, exploring and clarifying information
- Generating innovative ideas and possibilities
- Reflecting on thinking, actions and processes
Personal and social competence

- Social management

View a mapping of the General capabilities learning continua for this unit