Ready-Ed Publications

E-book Code: REAU4037

PHOTOCOPY MASTERS

Practical Science

Natural and Processed Materials for 10-12 year olds

- Practical hands-on science activities
- Contains comprehensive teachers' notes and lesson ideas

Written by Kevin Rigg. Illustrated by Terry Allen. Design & Typesetting by Shay Howard.
Edited by Jane Bourke. Published by Ready-Ed Publications (2007)

Email: info@readyed.com.au Website: www.readyed.com.au

ISBN 1 86397 685 X

Contents

Teachers' Notes

Natural & Processed Materials

This book contains a package of photocopiable worksheets designed to be used to cover the Science learning area of "***Natural and Processed Materials***" with 10-12 year old students.

At this level the students should be able to identify the factors which enable the choice of a particular material for a specific purpose. They should also understand how the properties of materials can be changed using various processes. The students will be involved in predicting, testing, analysing, assessing, illustrating and researching information to write up reports.

The lesson activities include changing the properties of materials, an analysis of the component parts of common objects, examining how the properties of some foods change with processing and additives and completing a home survey and report on hazardous chemicals.

Each lesson has the potential to:

- extend into more than one lesson by having separate parts to the lesson sheet. Some sections of a lesson may need planning on other paper before final copies are transferred to the lesson sheet. Some lessons may be too long for one lesson and could be completed at another time.
- expand into other curriculum areas using a similar theme. There are ideas for cross-curricular integration with other learning areas. Sometimes a whole day's work could be planned around one lesson sheet.

Science Materials and Equipment

The equipment needed has been kept to a minimum to facilitate ease of planning. It is readily available in schools or is easily acquired.

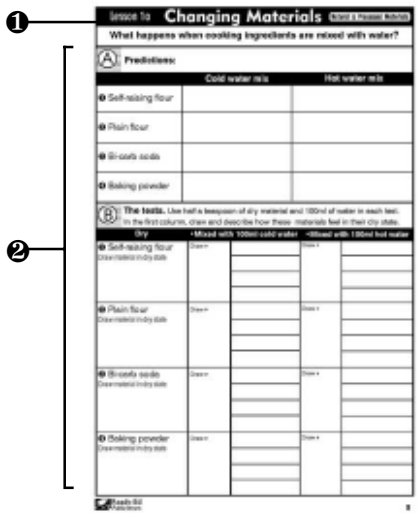
All lesson sheets are outcome linked to the various curriculum documents (see page 6).

Answers are provided where necessary (see page 28).

Other books in the Practical Science series:

- *Earth and Beyond*
- *Life and Living*
- *Energy and Change*
- *Working Scientifically*

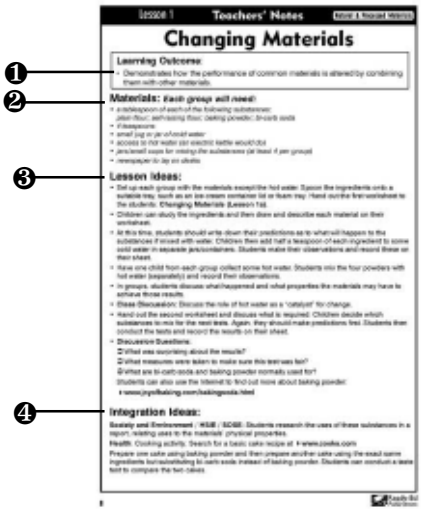
Lesson Sheets Layout



STUDENT LESSON SHEET

❶ Lesson title

❷ Student learning activities



TEACHERS' NOTES INCLUDE:

(FOR EACH LESSON)

❶ Outcome links;

❷ Required materials;

❸ Lesson plan ideas including extension ideas and teaching tips;

❹ Cross-curricular/integration ideas.

Changing Materials

Learning Outcome:

- Demonstrates how the performance of common materials is altered by combining them with other materials.

Materials: *Each group will need:*

- *a tablespoon of each of the following substances: plain flour; self-raising flour; baking powder; bi-carb soda*
- *4 teaspoons*
- *small jug or jar of cold water*
- *access to hot water (an electric kettle would do)*
- *jars/small cups for mixing the substances (at least 4 per group)*
- *newspaper to lay on desks*

Lesson Ideas:

- Set up each group with the materials except the hot water. Spoon the ingredients onto a suitable tray, such as an ice-cream container lid or foam tray. Hand out the first worksheet to the students: **Changing Materials (Lesson 1a)**.
- Children can study the ingredients and then describe each material on their worksheet.
- At this time, students should write down their predictions as to what will happen to the substances if mixed with water. Children then add half a teaspoon of each ingredient to some cold water in separate jars/containers. Students make their observations and record these on their sheet.
- Have one child from each group collect some hot water. Students mix the four powders with hot water (separately) and record their observations.
- In groups, students discuss what happened and what properties the materials may have to achieve those results.
- **Class Discussion:** Discuss the role of hot water as a "catalyst" for change.
- Hand out the second worksheet and discuss what is required. Children decide which substances to mix for the next tests. Again, they should make predictions first. Students then conduct the tests and record the results on their sheet.

- **Discussion Questions:**
  - ➲ What was surprising about the results?
  - ➲ What measures were taken to make sure this test was fair?
  - ➲ What are bi-carb soda and baking powder normally used for?

  Students can also use the Internet to find out more about baking powder:

  ▸ **www.joyofbaking.com/bakingsoda.html**

Integration Ideas:

Society and Environment / **HSIE** / **SOSE**: Students research the uses of these substances in a report, relating uses to the materials' physical properties.

Health: Cooking activity: Search for a basic cake recipe at ▸ **www.cooks.com**

Prepare one cake using baking powder and then prepare another cake using the exact same ingredients but substituting bi-carb soda instead of baking powder. Students can conduct a taste test to compare the two cakes.

Lesson 1a Changing Materials

Natural & Processed Materials

What happens when cooking ingredients are mixed with water?

A **Predictions:**

	Cold water mix	Hot water mix
❶ Self-raising flour		
❷ Plain flour		
❸ Bi-carb soda		
❹ Baking powder		

B **The tests.** Use half a teaspoon of dry material and 100ml of water in each test. In the first column, draw and describe how these materials feel in their dry state.

Dry	• Mixed with 100ml cold water		• Mixed with 100ml hot water	
❶ Self-raising flour Draw material in dry state	Draw ▸		Draw ▸	
❷ Plain flour Draw material in dry state	Draw ▸		Draw ▸	
❸ Bi-carb soda Draw material in dry state	Draw ▸		Draw ▸	
❹ Baking powder Draw material in dry state	Draw ▸		Draw ▸	