

**Practical  
Science**

# Earth and Beyond

for 10-12 year olds

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



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This book contains a package of photocopiable worksheets designed to be used to cover the Science learning area of “**Earth and Beyond**” with 10-12 year old students.

Using the activities in this book, students will gather information about the earth and the effects of natural phenomena on the earth as a whole. Students will have opportunities to research natural events such as catastrophes, investigate how humans can cope with space travel, and study the features of the universe and gain an understanding of the seasons. They will also be involved in sampling soils, gathering data from various sources, drawing diagrams and conducting research into soil erosion.

### 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 24).

### Other books in the Practical Science series:

- *Energy and Change*
- *Life and Living*
- *Natural and Processed Materials*
- *Working Scientifically*

### Lesson Sheets Layout

The diagram shows a 'Student Lesson Sheet' for the topic 'Soils'. It is divided into four quadrants labeled A, B, C, and D. Each quadrant contains a 'Magnified view (penicilline)' and a 'Type' section. Below each quadrant is a 'Colour match' section with a grid for recording data. At the bottom of the sheet is a 'Reflection' section with the prompt: 'How did the soil analysis go? Explain any problems you had collecting the data on the soil samples. Write your answers on the back of this sheet.'

### STUDENT LESSON SHEET

- ① Lesson title
- ② Student learning activities

The diagram shows a 'Teachers' Notes' sheet for the topic 'Soils'. It contains several sections: 'Learning Outcomes' (bullet points about understanding soil types and their uses), 'Materials' (a list of items like soil samples, magnifying glasses, etc.), 'Lesson Ideas' (detailed instructions for the activity, including safety and observation tips), and 'Integration Ideas' (suggestions for cross-curricular links like English, Art, and Science).

### TEACHERS' NOTES INCLUDE: (FOR EACH LESSON)

- ① Outcome links;
- ② Required materials;
- ③ Lesson plan ideas including extension ideas and teaching tips;
- ④ Cross-curricular/integration ideas.

# Soils

**Learning Outcome:**

- Illustrates ways that use of the Earth's resources changes the physical environment.

**Materials:** *Each pair/group will need:*

- dessert spoons
- jars labelled 1 to 4
- access to soil (within the school grounds)
- magnifying glasses
- scales to measure grams
- gloves for the children (optional)
- clipboard and paper for notes

**Lesson Ideas:**

***This activity can be done in pairs/groups.***

- Be sure to explain what this activity is about at the beginning of this lesson. Students will need to know the sorts of notes they should make as they collect their soil samples.
- Children will need to visit the school grounds to collect their four soil samples. They should collect as wide a variety of soils as possible, e.g. sand from the sand pit, red dirt, garden soil, compost and so on.
- Each pair/group needs to collect approximately two spoonfuls of each soil type and to label their samples carefully. Students should take notes (on clipboards) about where the particular sample was collected and what it is being used for (e.g. garden, path, etc.).
- Children then return to the classroom to study the four soil samples. They should identify the type of soil (sand, clay, compost, etc.). Students will also need to weigh their samples.
- Using magnifying glasses, students can have a closer look at their samples, observing any foreign bodies found in their collections.
- In groups, students discuss any problems they had collecting and analysing the soil data. Children can write their own responses for the Reflection (section E) on the back of their worksheet.
- If possible, take photos of the children at work and have the children write up captions for a class display.
- **Lesson 2: Soil Erosion** is an ideal follow up to this activity and examines soil erosion in the school grounds.

**Integration Ideas:**

**English (Speaking and Listening):** Children can present a talk on their data collection to a class/ group using the lesson sheet as a guide.

**Research:** Children can conduct research on the different uses of soils in the school grounds and what is required for each use, e.g. sand in the playground, gravel on the driveway and so on.

You will be looking at different types of soils found in the school ground. Study each soil type and complete the details.

**A****Soil A**

Magnified View (pencil drawing)

- ① Type: \_\_\_\_\_
- ② Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- ③ Colour match: \_\_\_\_\_
- ④ Where found: \_\_\_\_\_
- ⑤ Used for \_\_\_\_\_
- ⑥ Mass of sample: \_\_\_\_\_ g

- ⑦ Draw and label some of the foreign bodies found.

**B****Soil B**

Magnified View (pencil drawing)

- ① Type: \_\_\_\_\_
- ② Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- ③ Colour match: \_\_\_\_\_
- ④ Where found: \_\_\_\_\_
- ⑤ Used for \_\_\_\_\_
- ⑥ Mass of sample: \_\_\_\_\_ g

- ⑦ Draw and label some of the foreign bodies found.

**C****Soil C**

Magnified View (pencil drawing)

- ① Type: \_\_\_\_\_
- ② Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- ③ Colour match: \_\_\_\_\_
- ④ Where found: \_\_\_\_\_
- ⑤ Used for \_\_\_\_\_
- ⑥ Mass of sample: \_\_\_\_\_ g

- ⑦ Draw and label some of the foreign bodies found.

**D****Soil D**

Magnified View (pencil drawing)

- ① Type: \_\_\_\_\_
- ② Description: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- ③ Colour match: \_\_\_\_\_
- ④ Where found: \_\_\_\_\_
- ⑤ Used for \_\_\_\_\_
- ⑥ Mass of sample: \_\_\_\_\_ g

- ⑦ Draw and label some of the foreign bodies found.

**E****Reflection**

How did the soil analysis go? Explain any problems you had collecting the data on the soil samples. Write your answers on the back of this sheet.