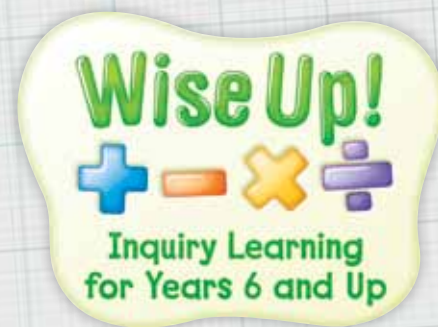


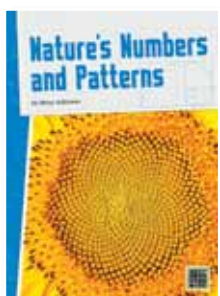
# Nature's Numbers and Patterns

Literacy Level 27 • Maths Level 3–4 • Geometry and Measurement



## Inquire to Learn!

+ - × ÷ + - × ÷ + - × ÷ + - × ÷



There are many ways in which *Nature's Numbers and Patterns* can be used as a base for Inquiry Learning. This is just one suggestion. It could also be used in a science unit on the importance of symmetry in nature.

### Literacy Achievement Objective:

Find ways to understand unfamiliar, especially content-specific, words and phrases.

### Specific Literacy Learning Outcome:

Understand content-related vocabulary by inferring meaning from context, looking at diagrams, and using glossary.

### Numeracy Achievement Objective:

- Investigate properties of symmetry in shapes.
- Find the lines of reflection symmetry in a shape.
- Identify the order of rotational symmetry in a given shape.
- Describe the reflection or rotational symmetry of a shape.
- Describe different polygonal shapes.
- Measure angles.

### Specific Numeracy Learning Outcome:

Be able to answer questions relating to angles, symmetry, number patterns, and shapes.

### Cross-Curricular and Topic Links:

science, environment, heat and energy, art

### Additional Technology Outcome:

Make a 3-D model that fits the golden ratio. (Session 4)

### Additional Visual Arts Outcome:

Develop visual ideas, in response to a variety of motivations.

### Additional Visual Arts Outcome:

Create artworks based on fractals. (Inquiry Learning Extension 2)

### Specific Science Outcome:

Understand that nature's patterns and shapes form for a reason.

**Session 1:** Using the Big Book, share-read *Nature's Numbers and Patterns*, stopping at natural points for discussion. Draw on the students' prior knowledge of the patterns in nature and symmetry in nature.

**Session 2:** Using the Big Book, work through the Literacy Focus questions. Guide the students towards achieving the literacy learning outcome.

### **Literacy Focus:**

1. *Recall:* Ask: What do planet Earth, a raindrop, and an orange have in common? (page 10) [They are all spherical, or round.]
2. *Comprehension:* Ask: Why do you think most things in nature try to save energy? (page 10) [Answers will vary, but should relate to fact that energy requires food.]

Continued on page 2

# Nature's Numbers and Patterns

## Teacher's Notes continued



**3. Vocabulary:** Ask: Do you know what *coil* means? (page 6) How do you know? [Answers will vary, but may include reference to the illustration of the helix. Discuss the role of illustrations in helping to clarify the meaning of words in text.]

**Session 3:** Using the Small Books, have the students reread *Nature's Numbers and Patterns*. Model answering the Wise Up! on page 5. In their maths groups, have the students answer the Wise Up! questions on pages 7, 9, 11, 12, 15, 17, 19, and 21. Help individual groups as necessary.

**Session 4: Technology:** Have the students work in groups to construct a cardboard model of a building designed on the golden ratio.

### Inquiry Learning Extension:

1. Have the students work at home to complete the challenge on page 24.
2. **Visual Arts:** Have the students create individual or class artworks based on fractals.

