Week 1 – Unit A1: Sequences

Focus + Resources	Lesson Notes
Introduction to the Unit Unit A1 Check-in *Page 1* **Objective** • To check understanding prior to Unit A1	***Unit A1 Check in*** • Use the check-in activity in the Teacher's Book as a warm up. Ask the student to change direction on a given signal. • Try some simple counting sequences, with the difference between each term being constant, to refresh the memory. • The check-in questions should be fairly straightforward – you might work back from the answers if a memory jog is needed.
Lesson 1 Unit A1.1 *Page 2* **Objectives** • To generate and describe integer sequences. • To generate terms of a simple sequence, given a rule. • To express simple functions using symbols. **Key Words** *Sequence, term, general term, position-to-term rule, term-to-term rule, T(n), generate* **Resources** • A1.1OHP • Revision Book Unit A4 (optional) **Homework resources** • Homework Book A1.1HW, page 1	***Mental Starter*** • Write down each series together and discuss them as a way of revising last year's work. • Note how the multiplier denotes the difference between each term and the first term is indicated by the number which is added or subtracted. ***Main Session*** **Introductory Activity** • Look carefully at 'term-to-term' rules first; the student will have met these before and they are more readily understood. • Use the example in the Student's Book and make up lots more of your own. • When the student is secure, move on to looking at position-to-term rules. You will find the notes in the Teacher's Book helpful, especially the 'Misconceptions' (page 3). **Exercise** • You will notice that all the exercises lead the student through the concept of position-to-term rules, so do take it steadily and use some of the examples to work through together. In the next lesson there will be further work to consolidate this concept. • Questions 6d and 7 are tricky – use them only for the confident student. They might best be tackled as joint discussions. See plenary. • For the confident student, the further activity might be a useful challenge. ***Plenary*** • You might use question 7 for discussion here. One way of analysing the pattern is to see it as crosses.

Notes to the student

Week 1

Lesson 1

Unit A4 in the Revision Book gives a concise explanation of key issues and develops the work. You might find it helpful to read it through. There are extra examples too, if you would like to try them.

You might need just to think carefully about sequences and what they mean as you won't have been looking at them for a while. Remember that a linear sequence is one in which the difference between each term is always the same – it is this type of sequence you will be handling for most of the time, especially when looking at finding the term from a formula (position-to-term). Keep an eye open for sequences around you – in patterns, perhaps, or in mathematical tables such as those which convert currency.

Position to term formulae need a little bit of careful thought. Have a look at them. Do you notice that the number which multiplies the position indicator actually tells you what should be added or subtracted to each term? The number which is added or subtracted in the formula gives us the starting point. Look at the following example:

n	1	2	3	4	5
T	3	7	11	15	19
Difference	+4	+4	+4	+4	

The difference between each term is +4. The tricky bit is to realise that this means that T = 4*n* **NOT** T = *n*+4!

Since T = 4n would give terms of 4, 8, 12, 16 and so on, we need to subtract 1 each time. Therefore the position-to-term formula is T = 4n + 1.

To work out the rule, find the difference first. This is the multiplier for *n*. Then add or subtract from the expression to adjust to the correct terms.

You will be spending more time on this in the next lesson, so have patience!

Homework is very tricky today. Your teacher might go through each question, before the end of the lesson. She might also take a quick peek at the answers for question 2 to unravel the sequences for you!

Lesson 2

With the starter, remember that you are substituting the known value into the formula and using your knowledge of algebra to solve it. Thus, for 5*n* – 1, if T(*n*) = 44, we know that 5*n* – 1 = 44, so 5*n* = 45 and so on.

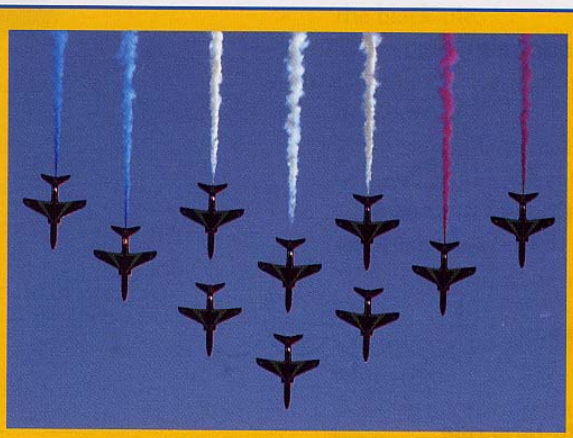
Today's lesson will support and consolidate the work you did yesterday, so take it steady and all will become clear! Do remember that Revision Book Unit A4 might be helpful background reading too.

Homework should be a bit more straightforward today, but check it through with your teacher before you leave the lesson.

A1 Sequences

This unit will show you how to:

- Generate terms of a sequence using-term-to-term and position-to-term definitions of the sequence.
- Generate sequences from practical contexts.
- Write an expression to describe the *n*th term of an arithmetic sequence.
- Generate terms of a quadratic sequence.
- Solve increasingly demanding problems and evaluate solutions.
- Present a concise, reasoned argument using symbols and explanatory text.
- Represent problems and synthesise information in algebraic form.



You find sequences in surprising places!

Before you start

You should know how to ...

1 Find missing terms in a sequence.

2 Substitute values into algebraic expressions.

Check in

1 Find the missing terms:

a 1, 4, 7, 10, __, __

b $^{-}3$, 0, __, __, 9, 12

c $^{-}1$, $^{-}5$, __, __, $^{-}17$, $^{-}21$

d 2.3, 2.5, __, __, __, 3.3

2 Substitute $n = 2$ into each of these expressions:

a $3n + 1$ **b** $2 + 6n$

c $6 - n$ **d** $9 - 4n$