

What claims does the company make / what does the programme target?

Lexia Reading Core5 is for children of all abilities in Years 1 to 6. Lexia Strategies for Older Students is aimed at individuals in Years 7 to 13 who have reading difficulties and need remediation. Skills targeted by each activity are described below.

Evidence for efficacy:

Macaruso, Hook, & McCabe (2006):

In this study, the reading performance of first graders ($n = 43$; treatment group) who used Lexia programmes in conjunction with daily reading instruction was compared to that of control students ($n = 84$) who were only receiving classroom instruction. Students used the now retired Lexia Reading programme as well as Lexia Strategies for approximately 6 months. The Gates-MacGinitie Reading Test (GMRT) Level BR was used to measure reading performance, and included assessments of letter-sound correspondences and recognition of basic story words.

Results revealed that while both treatment and control groups made significant gains on GMRT measures from pre- to post-test, there were no significant differences between groups at either pre-test or post-test.

A subsequent analysis was conducted only looking at "at risk" students from the sample ($n = 15$ for treatment group; $n = 15$ for control group). There were no significant differences between groups at pre-test, and both groups made significant gains from pre- to post-test. However, there was a significant difference on reading performance at post-test, with the difference favouring the treatment group. Further analyses revealed that this difference was specific to the letter-sound correspondences measure. Additionally, "at risk" students in the treatment group were performing at the same level as the treatment group at post-test, despite showing lower scores at pre-test. A correlation analysis on the "at risk" subsample also revealed that there was a positive relationship between reading performance gain scores and the number of skills units completed.

Limitations: one of the authors of the article, Robert McCabe, was the Director of Research and Product Management at Lexia Learning Systems. Therefore the study is not independent. The other authors also acted as consultants in the development of the programme. Though the

study used an active control group, it would have also been good to have an alternative treatment group to determine how Lexia compares to other intervention programmes. Sample sizes were small for the subgroup analysis. The study uses an earlier version of the Lexia programme.

Macaruso and Walker (2008):

Kindergarten children in classes ($n = 26$) receiving Lexia Early Reading (now discontinued) were compared to control children from matched classrooms ($n = 45$). Treatment children used Lexia for approximately 6 months, and completed a minimum of 45 sessions. All students also received the same daily reading instruction. All participants were measured on the DIBELS initial sound fluency (phonological awareness) and letter naming fluency subtests at pre-test. Letter naming fluency was also measured at post-test, as well as the segmentation fluency subtest (a different measure of phonological awareness). The change in the DIBELS measure of phonological awareness was because qualitative changes occur to pre-literacy skills during kindergarten. The GMRT, Level PR, was

also administered to students, but only at post- test as there is no measure that can be given to kindergartners at the start of the school year (i.e. pre-test). GMRT subtests included literacy concepts, oral language concepts, letter and letter sound correspondences, and listening comprehension.

Results revealed that there were no significant differences between groups on the DIEBELS measures at pre- and post-test. With the GMRT measures, significant differences were observed between groups (favouring the treatment group) on the oral language concepts subtest only.

Results from subsequent analyses looking only at "low performers" (these were the four students from each of the three treatment and three control classes with the lowest scores) were consistent with that of the main analyses. However, effect sizes were stronger when looking at low performers than when looking at the whole sample.

Limitations: the use of different DIEBELS phonological awareness measures at pre- and post- test and the lack of pre-test GMRT measures is a limitation. Initially, there were more students in the treatment group but several had to be excluded as teachers were not always consistent with treatment implication, thus several students did not reach the minimum 45 sessions criterion. The authors have been affiliated with Lexia Learning Systems, and also had assistance from members of the company. Consequently, it is not clear how independent the study may be. The discontinued Lexia Reading programme was used. There was no alternative treatment group in the study.

Macaruso and Rodman (2009):

This study compared the reading, spelling and oral language skills of struggling middle school students who used Lexia Strategies for Older Students ($n = 32$) to that of control students who were taught by the same teacher but did not receive Lexia assistance ($n = 13$). The word attack, letter-word identification, reading fluency, reading vocabulary, passage comprehension, oral comprehension and spelling subtests from the Woodcock-Johnson III Tests of Achievement were used to assess the participants at pre- and post-test.

Results revealed that there were no pre-test differences between the two groups. The Lexia treatment group made significant gains on the word attack, letter-word identification and passage comprehension measures from pre- to post-test. In contrast, the control group only made significant gains on passage comprehension. Groups were then compared on measures in which at least one group made significant gains. The authors found that significant differences favouring the treatment group were found for the word attack measure only.

Limitations: one of the authors, Alyson Rodman, is part of Lexia Learning Systems, therefore the study is not independent; no alternative treatment group was used; there was only one measure, out of several reading and language-related skills assessed, for which the treatment group made significantly greater gains relative to the control group.

Macaruso and Rodman (2011):

This article describes two studies. Study 1

In Study 1, 19 treatment pre-schoolers and 19 control pre-schoolers were compared on reading-related measures. All students were involved in a Language and Emergent Literacy Skills programme, but the treatment students also received Lexia training. GRADE Level P assessments were administered at pre- and post-test. GRADE Level P has three domains and seven subtests. The phonological awareness domain consists of the sound matching and rhyming subtests, the visual skills domain consists of the picture matching and picture differences subtests, and the concepts

domain involves the verbal concepts and picture categories subtests. There is also the additional listening comprehension subtest.

Results revealed that there were no significant differences between groups at pre-test. The treatment group made significant gains on overall GRADE scores from pre- to post-test, whereas the control group showed no gain. Further analyses revealed that there were significant group differences at post-test, favouring the treatment group, for the phonological awareness domain and the sound matching subtest.

Study 2

This study focused on low-performing kindergarteners, separated into treatment ($n = 47$) and control ($n = 19$) groups. All students participated in daily explicit phonics instruction for reading. Additionally, the treatment group completed Lexia exercises for approximately 7 months.

GRADE Level K was administered at pre- and post-test. This Level has two domains and seven subtests. There is the same phonological awareness domain and corresponding subtests from Level P. There is also the early literacy skills domain, which involves the print awareness, letter recognition, and same and different words subtest. There were also the additional listening comprehension and word reading subtests.

Results showed that there were no significant differences between groups on pre-test measures. Both groups made significant gains on overall GRADE, and on all domain and subtest measures. However, there was a significant difference between the two groups at post-test, with the results favouring the treatment group. Comparing the two groups on the domain and subtest measures at post-test results revealed that the treatment group showed greater letter recognition and word reading scores, though only word reading differences were significant when controlling for pre-test scores.

Limitations: teachers were not always consistent with implementation, resulting in a loss of some participants from the initial sample. Alyson Rodman is part of Lexia Learning Systems, therefore the study is not independent. An earlier, now retired version of Lexia Reading was used. No alternative treatment group was included in the study; There only seemed to be a benefit to using Lexia for one of the several measures assessed in Study 2.

Evidence against efficacy:

Ness, Couperus and Willey (2013):

The efficacy of the Lexia Reading programme in "at risk" students from a New Zealand Decile 1 primary school was evaluated in this study. 37 participants, ranging from Years 1 to 6, were recruited and randomly assigned to treatment or control groups. All students followed the normal class curriculum, but the treatment group also participated in Lexia exercises for at least 100 mins per week during a school term. Participants were assessed on the word reading, reading comprehension, spelling and pseudoword subtests of the Wechsler Individual Achievement Test (WIAT-II) at pre- and post-test (however, 5 year olds were treated as pre- schoolers, and thus could only be assessed on word reading and spelling).

The study found that there were no significant differences between groups on any of the WIAT- II subtests at either pre- or post-test.

Limitations: the sample size was somewhat small; an earlier version of Lexia Reading is used; the authors noted that when learners struggle frequently on a task, they are flagged as needing additional one-on-one instruction. The school in this study was not informed of this requirement, and also decided not to deliver the one-on-one instruction due to time constraints. As all students were flagged at some point, it is possible that the null results here were due to the lack of this one-on-one instruction. However, the authors argue that this would mean that the benefits of Lexia are then not due to computer-assisted instruction, but due to one-on-one instruction.

Overall, there seem to be more studies supporting Lexia Reading's efficacy than not. However, Ness et al. (2013) noted that the Macaruso studies discussed above (specifically Macaruso et al., 2006; Macaruso & Rodman, 2009; and Macaruso & Walker, 2008) do not provide consistent results. Additionally, peer-reviewed studies looking at Lexia Reading (excluding those looking at Lexia Strategies) have all been conducted on the earlier Lexia Reading programme, which has now been replaced by Lexia Core5. Therefore, we cannot comment on the efficacy of the newer Core5 programme. Additionally, there are a lack of studies looking at Lexia Strategies for Older Students and no studies comparing Lexia to alternative remediation techniques. As such, we cannot comment on Lexia Strategies' efficacy as an intervention. While Lexia Reading seems promising, it is recommended that further independent and peer-reviewed research be conducted.

Price:

The price of Lexia Reading Core5 varies depending on the type of license purchased. According to the Washington Learning Source website (http://www.wlearningsource.org/_bymfg_92-0-1.html), a one year single student licence costs US\$33.25, and an unlimited licence costs US\$9,405. On site training costs US\$1,212.50. Additional prices are displayed on the Washington Learning Source website.

A pricelist from Lexia Learning NZ (http://www.lexialearning.co.nz/docs/Lexia_Pricelist.pdf) prices Lexia Strategies for Older Students at NZ\$225 if more than 10 licences are bought. Training for one school is NZ\$500. Prices exclude GST. (*Note: Lexia Reading prices are also included in this pricelist, but Core5 has now replaced this programme*).

What it involves:

The Lexia programmes, created by Lexia Learning Systems, are comprised of several computerised activities. Each activity in the programme may have one or several different types of tasks, with each type involving a number of units. These units cover a particular sub-skill of the main skills targeted by the activity and will increase in difficulty as the learner progresses. The learner can only progress to the next unit if they master the skill within the current unit.

The programme also provides immediate feedback, and includes instruction and scaffolding when necessary. Scaffolding can generally involve simplifying the task by reducing choices, adjusting the complexity of language, altering the presentation and visual components of the task or providing embedded support. Additional instruction and scaffolding are presented when necessary, though if students require this more than once within a unit, the teacher is notified that the student is struggling and requires further assistance.

Lexia has an embedded Assessment Without Testing component, which provides educators with norm-referenced performance data that has been obtained without administering a formal test. Based on the student's skill level and progression, the system prescribes instructional intensity to improve performance and provides detailed reports on the student's skill deficits as well as recommended targeted instructional materials to improve skill development. The system is also able

to predict the student's chance of reaching an end of year benchmark.

Activities for each Level of Lexia Reading Programmes are described below. These have been obtained from Lexia Reading teacher manuals (Lexia Reading Systems, 2012, 2013).

Lexia Reading Core5:

Lexia Reading Core5 replaces and expands on the earlier Lexia Reading programme offered by Lexia Learning Systems. The activities are based on the United States' Common Core State Standards. The programme covers 6 areas of reading: phonological awareness, phonics, structural analysis, automaticity/fluency, vocabulary and comprehension. Specifically, the programme focuses on foundational skills to develop automaticity and fluency, listening and reading comprehension with complex text, and academic and domain-specific vocabulary to improve comprehension.

Lexia Reading Core5 allows students to independently develop reading skills in a structured and sequential manner. The learning path of each student is personalised and adaptive.

Level 1: A Picnic in the Woods

This focuses on pre-kindergarten skills.

- *Rhyming:* Two pictures are displayed under a target picture, and each picture is highlighted and named. The learner must select the picture that rhymes with the target image. Targets phonological awareness skills, specifically an awareness of rhyme patterns in spoken language.
- *Letter matching:* There are two tasks within this activity. In the first task, the learner must select the two identical letters from a selection of four. In the second task, the learner must select the lowercase letter that corresponds to the target uppercase letter. This activity is under the phonics component and targets the recognition of upper- and lower-case letters.
- *Categorising Pictures:* The learner must sort a set of objects into two or three categories. Targets vocabulary by developing knowledge of word relationships.
- *Nursery Rhymes:* a nursery rhyme is read along with images. Following this, the first part of the nursery rhyme is presented along with three pictures, and the learner must select the picture that best matches that part. The learner then progresses to the next part of the nursery rhyme, and the process continues until the rhyme is completed. This targets comprehension as it focuses on developing an understanding of narrative story structure.

Level 2: A Day at the Beach

This focuses on early kindergarten skills.

- *Blending and Segmenting 1:* in the blending tasks, three pictures are displayed and a target word named with a pause between each syllable. The learner must select the picture that represents the target word. For the segmenting task, one picture is displayed and named with no pauses. The learner must drag down a token for each syllable in the word. As each token is dragged down, the programme dictates the syllable. Targets phonological awareness, specifically an awareness of syllables in words.
- *Beginning Sounds:* in the matching task, three pictures are highlighted and named. The learner must select the two pictures with the same initial sound. With the identifying task, three pictures are highlighted and named and a target sound is then

named. The learner must select the picture that begins with the target sound. Targets phonological awareness.

- *Letter Names*: in the letter recognition task, a target letter is named and displayed along with six or seven other letters. The learner must then select the letter from an alphabet arc. In the alphabetising task, six letters are displayed out of alphabetical order and the learner must organise them in order. With this task, the alphabet arc is displayed initially but then disappears after the learner's first response. This activity falls under the phonics component and targets letter recognition and sequencing.
- *Spatial Concepts*: the receptive task involves selecting a subject in an image in relation to objects. In the expressive task, the learner must place one or two shapes in relation to an object. This task falls under the vocabulary component and targets an awareness of spatial concepts.
- *Picturing Stories 1*: a story is read in three parts. After each part, the learner is presented with three pictures and must choose the picture that best matches that part. Targets comprehension, specifically an understanding of narrative story structure.

Level 3: A Snow Day in the City

This level focuses on kindergarten skills.

- *Blending and Segmenting 2*: this is similar to *Blending and Segmenting 1* from Level 2. Targets phonological awareness, specifically the blending of phones and onset/rimes, as well as the segmenting of phonemes.
- *Consonant Sounds*: the letter to picture matching task involves selecting the letter from a possibility of three that matches the target picture (the picture is also named). This process is reversed in the picture to letter matching task. In the consonant discrimination task, paired letters with similar sounds (e.g. d and t) are presented with five pictures that begin with one of the two letters. A student selects a picture, which is then named, and must sort it based on the first sound of its name. Targets phonics, specifically knowledge of letter-sound correspondences for beginning consonants and discrimination between similar sounding consonants.
- *Sight Words 1*: in the recognition task, the learner must select the target word. Foils are presented – these include two close spelling of the target word and another sight word. In the construction task, the learner hears a target word and must organise letters for the word, which are out of order, into the correct order. In the phrases task, a picture and an incomplete phrase are displayed. The learner hears the phrase and must then select the word (from three choices) that completes the phrase. In the automaticity task, words move on the screen and the learner must select target sight words from four choices. Targets fluency, specifically instant recognition of regular and irregular high-frequency sight words.
- *Advanced Descriptors*: four pictures are shown on screen. The learner hears a difficult word that describes three of the pictures and must select the picture that the word does not describe. This targets vocabulary knowledge for unfamiliar, high-level words through deductive reasoning.
- *Picturing Stories 2*: this task is similar to *Pictures Stories 1* from Level 2.

Level 4: The Amazon Rainforest

This focuses on Year 1 skills.

- *Ending Sounds*: in the recognition task, the learner hears a target sound and the names of three pictures. They must select the picture that ends with the target sound. In the word completion task, a partial consonant-vowel-consonant (CVC) word is displayed and named. The learner must select the letter from three choices that completes the word. Targets phonological awareness, specifically letter-sound correspondences for vowels.
- *Short Vowel Sounds*: in the letter to picture matching task, a short vowel is introduced in a letter morph with a target word. Two pictures are displayed and named, and the learner must select the picture that begins with the target short vowel sound. In the picture to letter matching task, this procedure is reversed. Targets phonics.
- *Beginning Sounds & Letters*: a partial word is displayed and named. The learner must select the letter (from three or four choices) that completes the word. Targets phonics, specifically letter-sound correspondences for beginning consonants in words.
- *Combining Adjectives*: the learner hears two adjectives and must select the picture (from a selection) that is best described by the adjectives. Targets vocabulary, specifically an understanding of adjectives as they relate to nouns.
- *Sequencing Stories 1*: the learner hears a story and must sort images of the story into the correct order. Targets comprehension, specifically an understanding of narrative structure and story sequence.

Level 5: The Scottish Cliffs

This level focuses on Year 1 skills.

- *Simple Word Chains*: a CVC word is shown on screen below four letters. The learner must replace the word on screen with a spoken word by dragging one of the four letters to the appropriate part of the displayed word. Targets phonics, specifically sound manipulation skills and letter-sound knowledge.
- *Medial Vowels*: a CVC word is spoken and the learner must select the vowel heard from between two to five choices. Targets phonics.
- *Picture-Word Match 1*: in the picture to word matching task, five pictures are displayed along with one CVC word. The learner must select the picture that matches the word. The opposite occurs with the word to picture matching task. This activity falls under the phonics component, and targets the automatic recognition of CVC words and word-level comprehension skills.
- *Sight Words 2*: this is similar to the *Sight Words 1* activity from Level 3.
- *Sequencing Stories 2*: this is similar to the *Sequencing Stories 1* activity from Level 4. However, in addition to sorting after the images into sequential order, the learner must also choose the main idea from four scenes. Targets comprehension.

Level 6: A Day in Paris

This targets early Year 2 Skills.

- *Building Words*: in the word comprehension task, the learner hears a word and must drag down letters to spell the word. In the long and short vowel task, the learner must sort pictures into either the short vowel sound column or the long vowel sound column. Targets phonics, specifically segmenting skills and letter-sound knowledge.

- *Consonant Digraphs*: in the digraph to picture matching task, the learner must select the word that matches the picture. Foils include two words that closely match the spelling of the target word as well as another sight word. In the word completion task, three digraphs are presented above an incomplete word. The learner hears a target word and must select the appropriate digraph that completes the target word. Targets phonics, specifically letter-sound knowledge for common consonant digraphs.
- *Sight Words 3*: This is similar to the *Sight Words* activities from previous levels.
- *Categorising Words 1*: in the categorising task, the learner must sort six CVC words into one of two categories (categories can be things like animals, actions, living things, outside, kitchen and inside concepts). In the associations task, a target word is displayed along with three other CVC words. The learner must select the word that best associates with the target word. This activity falls under the vocabulary component, and targets an understanding of word relationships and decoding.
- *Picture-Phrase Match*: In the one phrase task the learner sees three pictures above a phrase and must select the picture that best matches the phrase. The opposite is done in the three phrases task. In the questions task, a picture is shown along with a “yes” or “no” question about the image, which the learner must answer. Targets comprehension.

Level 7: The African Serengeti

This level focuses on beginning to middle Year 2 skills.

- *Reversible Letters (b, d, p)*: in the visual sort task, the learner must sort b, d and p letters into their appropriate boxes. In the auditory sort task, the learner hears a word with b, d or p and must select which of the three boxes the word belongs to. In the construction task, the learner must select b, d or p to complete an incomplete word that was named. Targets phonics, specifically the instant recall of letter-sound correspondences for letters that are often confused.
- *Silent E Recognition*: in the visual sort task, the learner must sort short vowel and long (silent e) vowel words. In the long and short recognition task, a word is named and the learner must select whether it is a short or long (silent e) vowel word. In the auditory sort task, a word is named and the learner must categorise it as a short or long (silent e) vowel word. In the word recognition task, the learner must select a named word from a choice of six short and long (silent e) vowel words. Targets phonics, specifically the knowledge that silent e marks long vowel sounds.
- *Contractions & Word Families*: in the contraction task, the learner has to choose the words that form a named contraction. In the visual recognition task, the learner has to select the named contraction from a choice of six contractions. In the word scramble task, the learner must find a spoken target word in a word scramble. In the construction task, the learner must arrange four or five letters to spell a named word. This task falls under the phonics label and targets knowledge of common contractions, as well as the identification and construction of irregular words that contain common word family patterns.
- *Picture-Word Match 2*: this is similar to the *Picture-Word Match 1* activity from Level 5.
- *Sentence Comprehension 1*: the learner selects the correct word from a choice of three to complete a sentence. Targets comprehension.

Level 8: The South Pole

Focuses on middle to end Year 2 skills.

- *Silent E Construction*: the learner has to spell a named word by choosing a vowel sound and also determining whether the word needs a silent e. This activity falls under the phonics component of the programme, and targets learners' ability to apply the silent e pattern to long vowel words.
- *Long Vowel Teams*: in the single word construction task, an incomplete word is shown and named. The learner has to select the vowel team (from three or four choices) that completes the word. In the construction with riddle task, an incomplete word is shown and a phrase containing the word is read. The learner has to select the vowel team (from a choice of three or four teams) that completes the word. In the sentence completion task, the learner has to select a vowel team from a choice of three that completes a sentence. Targets phonics, specifically letter- sound knowledge for long vowel team patterns.
- *Two Syllable Words*: in the visual sort task, the learner has to sort word parts into two or three boxes based on syllable type. In the single word construction task, a word is displayed and the learner has to drag word parts into the appropriate box to spell out the word. In the sentence completion task, the learner has to choose one of three words to complete an incomplete sentence. Targets phonics, specifically the ability to identify open, closed and silent e syllables and combine syllables to form two syllable words.
- *Multiple Meaning Words 1*: three boxes, each with words that can have multiple meanings (e.g. pen) are displayed. The learner has to sort six pictures, each corresponding to one of the three words, into the appropriate box. Targets vocabulary.
- *Sentence Comprehension 2*: three incomplete sentences are presented below five words, and the learner must select the appropriate word to complete each sentence. The individual must then answer questions about the sentences. Targets comprehension, specifically the ability to read and understand short narratives and answer detailed questions.

Level 9: The Egyptian Desert

This level focuses on end of Year 2 skills.

- *Vowel Combinations*: in the word construction task, the learner has to complete an incomplete word by selecting the appropriate vowel combination (from a choice of three). In the auditory recognition task, the learner has to select a named target word from a visual display of six words. In the sentence completion task, a sentence with an incomplete word is displayed and the learner must select the vowel combination (from three choices) that completes the word. This targets phonics, specifically letter-sound knowledge for complex vowel combinations.
- *R-Controlled Vowels*: this is similar to tasks in vowel combinations, but focuses on r-vowel pairs instead.
- *Sight Words 4*: this is similar to *Sight Words* activities from earlier levels.
- *Categorising Words 2*: this is similar to *Categorising Words 1* from Level 5, but includes more complex words and more choices in the associations task.
- *Sequencing Sentences*: between three to five sentences are displayed, and the learner has to sort sentences into the correct order to tell a story. Questions are then displayed, which focus on what the story was about and factual recollection. Each question is presented with a choice of three answers. This targets

comprehension.

Level 10: An English Garden

This level focuses on beginning Year 3 skills.

- *Advanced Word Chains:* the learner has to change one word into another by swapping or adding one letter or sound from four letter choices, or deleting a letter or sound using a delete option. This targets phonics, specifically the ability to manipulate phonemes in words to create new words.
- *Multi-Syllable Words:* in the visual sort task, the learner has to sort ten syllables into two or three boxes, depending on syllable type. In the single word construction task, the learner hears a two syllable word, and must construct the word from a selection of eight syllables. In the sentence construction task, the student reads a sentence that has half a word missing, and must complete the word from a choice of six possibilities. This targets phonics.
- *Simple Suffixes:* in the visual sort task, the learner has to sort words into the appropriate box, based on their endings. In the auditory recognition task, the student hears a word and must click the box (from three or four possibilities) that has the correct suffix. In the sentence completion task, the learner must select the suffix from a choice of three to complete a sentence with half the word missing. This targets structural analysis by focusing on knowledge of common suffixes and an awareness of the morphological structure of words.
- *Sight Words 5:* this is similar to *Sight Words* activities from earlier levels. However, for the recognition task in this activity, the learner must highlight a spoken target word from a word grid puzzle.
- *Building Sentences:* this is similar to the *Sequencing Sentences* activity from Level 9. However, instead of sorting sentences into the correct order, the learner has to sort words into the correct order to form a sentence before answering questions about the sentence. This targets comprehension through an awareness of sequence structure.

Level 11: The Swiss Alps

This focuses on middle Year 3 skills.

- *Hard and Soft C & G:* in the auditory discrimination task, the learner hears a word and must sort it based on whether it has a hard or soft sound. In the visual sort task, the learner sorts ten words into boxes, depending on whether it has a hard or soft sound. In the word recognition task, the learner must select the word they hear from a choice of six words. This activity falls under the phonics component, and targets knowledge of spelling patterns that correspond to the hard and soft "c" and "g".
- *Syllable Division:* in the vowel identification task, the learner hears a word and must highlight the word in a puzzle. In the syllable division task, the individual hears a target sight word, and must organise letters of the word, which are out of order, into the correct order. This falls under the phonics component, and targets and understanding of rules for dividing multi-syllable words.
- *Spelling Rules 1:* in the spelling dictated words task, the learner has to type a spoken word. In the sentence completion task, the learner hears a sentence, which is also displayed but with a word missing. They must then type in the missing word. This activity falls under the phonics component, and targets spelling.

- *Synonyms & Antonyms:* a picture is displayed and named. The individual must then select a word (from a selection of three) that is the synonym or antonym of the picture. This targets vocabulary.
- *Sentence Structure:* a sentence is chunked into words or phrases, and the learner must select the “who”, “what”, “where”, “when”, “how” or “why” of the sentence. This falls under the comprehension component, and targets an awareness of sentence structure.

Level 12: A Russian Circus

This focuses on end of Year 3 skills.

- *Irregular Plurals and Words:* in the identifying task, regular (singular or present) forms of a noun or verb are displayed over four possibilities of its irregular (plural or past) form, and the learner must select the correct irregular form. In the sentence completion task, two sentences are displayed, the first of which contains the regular form of a word and the second of which is missing the word’s irregular form. The learner must select the correct irregular form (from a selection of three) to complete the sentence. This activity comes under the phonics components, and targets knowledge of common irregular plural nouns and past tense verbs.
- *Latin Prefixes:* the tasks here are similar to that of the *Simple Suffixes* activity from Level 10, but focuses on Latin prefixes instead. This falls under the structural analysis component of the programme, and targets knowledge of common prefixes and an awareness of the morphological structure of words.
- *Passage Fluency 1:* the learner reads a two-part passage that has 10 words missing. For each part, the individual must select the five missing words in less than one minute. Accuracy and rate are measured. The targets on-level text accuracy and fluency.
- *Similes & Metaphors:* in the completion similes task, the individual must complete a simile by choosing from three possibilities. In the meaning of metaphors task, the individual must select the correct meaning of a metaphor from three choices. This targets vocabulary.
- *Passage Comprehension 1:* the learner reads a passage and must then answer questions about the passage by selecting one of three possible answers for each question. If an incorrect answer is selected, explicit instruction on the type of question or higher order thinking skill required is given. The learner is then able to reread the passage and answer the questions again. This targets comprehension.

Level 13: The Indian Rainforest

Targets early Year 4 skills.

- *Spelling Rules 2:* The spelling dictated words task here is similar to that from the *Spelling Rules 1* task from Level 11. This activity also includes a constructing words task, where the learner hears a word and sees its base and suffix. They must then type the word by applying the spelling rule. This falls under the structural analysis component, and targets knowledge of common spelling rules used when adding suffixes to base words.
- *Latin Suffixes:* This is similar to the *Simple Suffixes* activity from Level 10, but tasks focus on Latin suffixes instead. This also falls under the structural analysis component, and targets knowledge of Latin-based suffixes and an awareness of the morphological structure of words.
- *Passage Fluency 2:* This is similar to the *Passage Fluency 1* activity from Level 12.

- *Idioms 1*: In the idioms meanings task, an idiom is presented alone and in context, and the learner must select the meaning of the idiom from three choices. In the review task, the individual must complete an unfinished sentence by selecting the idiom (from three possibilities) that best completes the sentence. This targets vocabulary.
- *Passage Comprehension 2*: This is similar to the *Passage Comprehension 1* activity from Level 12.

Level 14: A Japanese Garden

This focuses on end of Year 4 skills.

- *Prefix Meanings*: in the visual sort task, the learner must drag number prefixes into the appropriately numbered box (e.g. "tri" dragged to box 3). If the individual has dragged the prefix into the correct box, they hear the prefixes' meaning. The auditory recognition task is similar to that from the *Simple Suffixes* activity from Level 10, but focuses on prefixes. Similarly, the sentence completion task is also like that from the *Simple Suffixes* activity, but focuses on prefixes, includes sentence with the entire word missing, and has more word possibilities to choose from.
- *Sight Words 6*: this is similar to *Sight Words* activities from earlier levels. However, for the recognition task in this activity, the learner must highlight a spoken target word from a word scramble.
- *Passage Fluency 3*: this is similar to *Passage Fluency* activities from earlier levels.
- *Simple Analogies*: in the identifying related words task, the learner must select a word (from three choices) that most closely relates to a target word. In the recognising relationships task, three pairs of words are shown and the individual must select the pair that shows the type of relationship that is named. In the analogy completion task, the learner must complete an analogy by selecting the correct word from three choices. This falls under the vocabulary component of the programme, and targets an understanding of word relationships in simple analogies.
- *Passage Comprehension 3*: this is similar to *Passage Comprehension* activities from earlier levels.

Level 15: The Great Barrier Reef

Focuses on early Year 5 skills.

- *Root Meanings*: in the picture matching task, a root is defined and the learner must select the matching picture from four choices. In the auditory recognition task, a word is named and the student must select the box (from four choices) containing the root of the word. In the matching words to definitions task, a root is defined and the learner must choose the word (from three possibilities) that matches the definition. In the sentence completion task, the learner must drag a word (from three choices) to complete a sentence. This falls under the structural analysis component, and targets knowledge of meanings of Latin-based roots.
- *Sight Words 7*: this is similar to the *Sight Words 6* activity from Level 14.
- *Passage Fluency 4*: this is similar to *Passage Fluency* activities from earlier levels.
- *Multiple Meaning Words 2*: two sentences with blanks are displayed. The learner must select a multiple meaning word (from three choices) that completes both the sentences. This targets vocabulary.

- *Passage Comprehension 4*: this is similar to *Passage Comprehension* activities from earlier levels.

Level 16: A Hawaiian Paradise

This focuses on end of Year 5 skills.

- *Prefix Change Rules*: in the combining task, a prefix and stem of a word is displayed. The learner hears the combined word and must type it. In the spelling task, a word is spoken and the learner must type it. This targets structural analysis.
- *Spelling Rules 3*: the spelling dictated words task here is similar to that from the *Spelling Rules 1* task from Level 11. This activity also includes a combining base and suffix task, in which a base and suffix is displayed and the learner must type the combined word after it is dictated. This targets structural analysis and knowledge of spelling rules.
- *Passage Fluency 5*: this is similar to *Passage Fluency* activities from earlier levels.
- *Idioms 2*: in the identifying idiom meanings task, a sentence with an idiom is presented and the learner must select the meaning of the idiom from three possibilities. In the sentence completion task, a partial sentence is shown and the individual must select the idiom that best completes the sentence from three possible choices.
- *Passage Comprehension 5*: this is similar to *Passage Comprehension* activities from earlier levels.

Level 17: A Southwest Fiesta

This focuses on early Year 6 skills.

- *Greek Combining Forms 1*: in the picture matching task, the learner must select the picture (from four choices) that matches a named target word. In the visual sort task, the learner must sort words into the appropriate boxes, based on their suffixes. In the word construction task, the learner must combine two forms to construct a word. In the sentence completion task, the individual must choose a word (from three possibilities) that best completes a sentence. This falls under the structural analysis component, and targets knowledge of Greek combining forms.
- *Passage Fluency 6*: this is similar to *Passage Fluency* activities from earlier levels.
- *Shades of Meaning*: in the identifying common meanings task, the learner selects the "odd one out" from a selection of four words. In the ordering task, the learner must place three words in order according to their shade of meaning. This activity targets vocabulary.
- *Signal Words*: in the identifying signal words task, a sentence is shown with a highlighted transition word, and the individual must select a synonym for the word from three choices. In the sentence completion task, a partial sentence is displayed and the learner must use the signal word to determine which of three possibilities best completes the sentence.
- *Passage Comprehension 6*: this is similar to *Passage Comprehension* activities from earlier levels.

Level 18: The Ancient Greek Countryside

This level focuses on end of Year 6 skills.

- Greek Combining Forms 2: This is similar to the Greek Combining Forms 1 activity from Level 17.
- Special Accent Rules: In the auditory recognition task, the learner hears a word and must select the word from a display of six words. In the identifying task, the learner sees and hears a word and must identify the accented syllable. In the sentence completion task, the learner must select the word (from three possibilities) that completes a sentence. These tasks fall under the structural analysis component, and targets knowledge of accent placement rules.
- Passage Fluency 7: This is similar to Passage Fluency activities from earlier levels.
- Complex Analogies: This is similar to the Simple Analogies activity from Level 14, but focuses on more complex analogies.
- Passage Comprehension 7: This is similar to Passage Comprehension activities from earlier levels

Lexia Strategies for Older Students:

This focuses on foundational reading skills, beginning at Year 1 level, but has a more age-appropriate user interface and topics. The content develops basic phonological awareness through advanced decoding skills, vocabulary development and comprehension activities. The activities involve high utility words and academic vocabulary.

Students are placed at an appropriate level for their abilities. However, if the individual struggles with any of the activities, the programme provides them with scaffolding by allowing them practice the skill with additional assistance. Once the learner is able to complete the task with scaffolding, they return to the standard, unassisted version of the task.

Level 1

- *Short Vowel Sounds:* contains four tasks. In the first task, the learner chooses vowels and hears their sound. In the second task, the learner matches short-vowel sounds to target words and pictures. In the third task, the learner hears a sound and must select the corresponding vowel. In the final task, the learner hears a word and must type out the initial vowel. This activity targets letter-sound correspondences for short vowels.
- *Consonant Sounds:* this activity involves two tasks. In the first task, the learner must complete the spelling of a spoken word or detached syllable by selecting the correct initial or final consonant, consonant digraph or consonant blend. In the second task, which is timed, the individual must select spoken words or detached syllables as quickly as possible. This targets letter-sound correspondences and an awareness of initial and final sound segments within words.
- *b, p, d:* this consists of three tasks. In the first task, the learner must sort the letters b, d, and p, or words that include those letters, into the appropriate boxes. In the second task, the learner hears a word containing b, p or d in the initial or final position, and must click the box corresponding to the appropriate letter. In the final task, the learner must select b, d or p to complete a spoken word.
- *Middle Vowels:* the learner has to select the correct short-vowel letter to complete the spelling of a dictated word or detached syllable. This targets the automatic retrieval of letter-sound correspondences and sound segmentation for short vowel words.
- *Short Vowel Words:* the student must match a word with the correct picture, first untimed and then timed. This targets the automatic recognition of short vowel

words.

Level 2

- *Letter Switch:* this activity involves three tasks. In the first task, the learner replaces a letter or letter cluster of a word or detached syllable to form a spoken word. In the second task, the learner hears a target word or detached syllable and must select the word from a list. In the third task, the learner must choose the correct word to complete a sentence. This targets sound segmenting skills for short and long (silent e) vowels.
- *Short & Long Vowels:* this activity consists of three tasks. In the first task, the learner has to sort spoken words, based on whether they have long or short vowels, as quickly as possible. In the second task, the learner has to progress through a maze by choosing between two spoken words that are contrasted by a silent e. In the final task, the learner must construct spoken words. This targets an understanding of the concept that a silent e acts as a signal for the long vowel sound.
- *Sight Words:* this involves three tasks. The first task involves the learner selecting spoken words from a random sample of visually presented familiar words. In the second task, the individual has to highlight target words from a word grid. In the final task, the learner initially types a spoken word that is also on screen, then types in missing letters of the target words, and then types in the target words without a visual model. This activity targets fluency for Year 2 and Year 3 sight words.
- *Two Syllable Words 1:* this activity involves three tasks. In the first task, the learner hears a word and must spell it out by matching syllables. In the second task, the learner matches two syllables to spell out familiar words. In the final task, the learner has to complete a sentence by selecting the most appropriate word from several possibilities. This targets reading of two syllable short vowel and long vowel words.
- *Sentences & Paragraphs:* the learner has to complete a sentence by selecting the correct word. A picture that illustrates the theme accompanies the sentences/paragraphs. Targets reading comprehension.

Level 3

- *Vowel Digraphs:* this activity involves four tasks. In the first task, the learner must complete the spelling of a spoken word by choosing the appropriate vowel combination. In the second task, the learner has to select visual representations of spoken words. In the third task, the learner has to sort words based on the vowel combination. In the final task, the individual practices reading vowel-combination words in sentences. This targets letter-sound correspondences for vowel combinations and automatic recognition of words with these vowel combinations.
- *Vowel -r:* this involves three tasks. In the first task, the learner must select a spoken target word from a group of words containing vowel -r combinations. In the second task, the learner must select a spoken word by ordering letters on screen. In the final task, the individual has to select the correct vowel -r combination to complete a word in a sentence. This activity targets letter-sound correspondences for vowel -r combinations.
- *Suffixes:* this activity involves three tasks. With the first task, the learner has to sort words into boxes based on their suffixes. In the second task, the learner selects spoken words from a list. The word is then displayed without the suffix, which the individual must type in. In the third task, the learner has to choose the missing suffix and place

it next to the correct word to complete a sentence.

- *Two Syllable Words 2*: this is a follow on of *Two Syllable Words 1* from Level 2.
- *Paragraphs 1*: the learner has to complete a paragraph with missing words by typing in the appropriate sight words from a list. The paragraph is presented with a picture that illustrates the theme. This activity targets reading comprehension.

Level 4

- *Syllable Types*: this activity involves two tasks. In the first task, the learner hears a detached syllable and must select the correct syllable and sort it into the appropriate file card. In the second task, the learner constructs two syllable words by matching two syllables. The word is presented in a column and the learner has to type it out. Targets automatic word recognition of two syllable words.
- *Two Sounds of C & G*: this activity consists of four tasks. In the first task, words have to be sorted into boxes based on whether they have a hard or soft c or g sound. In the second task, the individual has to select a spoken word from a group of words. In the third task, the learner must complete an incomplete word by typing in the missing letters. In the fourth scene, the student has to match the appropriate ending of a sentence to its beginning. This targets an awareness of the rules regarding the pronunciation of c and g.
- *Three Syllable Words*: this involves three tasks. In the first task, the learner has to rearrange detached syllables to form a three syllable word. In the second task, the learner copies a word by typing in the syllables. In the final task, the learner has to arrange detached syllables from a grid to form words, without hearing the words first.
- *Paragraphs 2*: this is similar to the *Paragraphs 1* activity from Level 3.

Level 5

- *Anglo Saxon*: this activity involves four tasks. In the first task, the learner hears a prefix or suffix and must select it from a group of affixes on screen. In the second task, the learner hears a target word and must then select the affix and place it next to the root to form the target word. In the third task, the learner has to type an affix from memory on a blank in front of a root word. Scaffolding is provided if the individual struggles. In the final task, the learner has to select the appropriate suffix to complete a sentence.
- *Latin*: this activity involves five tasks. In the first task, a prefix is displayed next to a box of letter strings that may or may not match the prefix. The learner has to select the letter strings that match the prefix. In later units, the individual must select the dictated suffix instead. In the second task, the learner uses letters to spell out the affix of a spoken word. In the third task, the learner has to sort the affix and root of words into the appropriate boxes. In the fourth task, the learner has to match roots to affixes to form a word. In the final task, the learner has to complete sentences by typing in the missing affix. Units 7 to 10 involve slightly different tasks. In one task, the learner must select the prefix (from three possibilities) that indicates what prefix change has occurred to the target word. In the other task, a root is shown with three prefixes and possible changes. The learner hears a word and must choose the correct word to combine with the prefix and sort it into the appropriate box. Targets word attack strategies.
- *Special Accents*: tasks vary depending on each unit. Tasks place emphasis on accent placement rules and pronunciation. Tasks also involve students matching affixes, identifying affixes and words containing affixes and typing in words and affixes. In

every unit, sentences are included that assist in the application of rules to contextual information.

- *Prefix & Root Meanings:* again, tasks vary depending on each unit. Tasks focus on constructing and reading words with common Latin roots and prefixes related to number and negotiation. Prefix and root meanings are also emphasised, and sentences and paragraphs are used to reinforce conceptual application to conceptual material. Targets vocabulary.
- *Greek:* tasks vary depending on the units. The meanings of combining Greek forms are emphasised and words are analysed according to meaning. Meaning is reinforced throughout the activity through the use of phrases. Targets vocabulary and word identification of words with common Greek forms.

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