Reading through Spelling
Kerry Mitchell & Susan Johnston
Learning Outcomes

You will be able to:

• identify the key findings of neuroscience in relation to the reading process and adults with dyslexia

• develop age appropriate teaching strategies for adult learners with dyslexia that demonstrate best practice in reading instruction
Population of learners

adults with dyslexia

BUT

research based best practice for all adult poor and non readers
Dyslexia

is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction.

(Lyon, Shaywitz, & Shaywitz, 2003)
is not a natural process ...

it requires explicit and systematic teaching

(Lyon, 2009)
The greatest potential barrier to significant and lasting improvements in student’s literacy levels is some teachers’ lack of knowledge of how (children) actually learn to read

(Response of LDA to Draft Australian Curriculum .... 2010)
So ....

how do we learn to read?
The classical neurological model of reading (top) is now replaced by a parallel and "bushy" model (bottom). The left occipito-temporal "letterbox" identifies the visual form of letter strings. It then distributes this invariant visual information to numerous regions, spread over the left hemisphere, that encode word meaning, sound pattern, and articulation. All the regions in green and orange are not specific to reading; they primarily serve the perception and manipulation of speech.
Three stages of reading

- logographic or pictorial stage
- phonological stage
- orthographic stage
The reading process: Phonological awareness

http://www.ldonline.org/Ld_indepth/reading/chard_phono_awareness.html
Parallel systems

Competent readers use parallel systems

- phonological route; words are very regular, rare or novel

- lexical route; words that are frequent or pronunciation is exceptional
The reading process

http://childdevelopmentinfo.com/learning/brain.shtml
In poor readers

• the substitution of synonyms when reading *(painter for artist)* may indicate poor phonological processing

• inability to read irregular words may indicate poor lexical processing
So ..... 

• the conversion of letters into sounds is the key stage in reading acquisition (Dehaene, 2009)

• teaching effort should initially focus on the grasp of the alphabetic principle
Research based instruction .... must enable the learner to identify:

- speech sounds in words
- graphemes for phonemes
- spelling patterns and ending rules
- morphemes and how they are represented
- history of the English language

(Moats, 2009)
Reading through spelling

- *Spelling requires awareness of phonemes, syllables and morphemes as well as specialized memory for letter sequence* (Moats, 2006)
- Spelling and reading build and rely on the same mental representation of a word
- Knowing the spelling of a word makes the representation of it sturdy and accessible for fluent reading
Effective instruction strategies

Must be:

• explicit
• repetitive: at least 40 repetitions
• sequential: easiest to hardest/more complex
• within the learners current knowledge of graphemes and phonemes
• multisensory
Fluency/ Automaticity

- **Sight words**
  - Letter memory - irregular
  - Common words
  - Homophones

- **Morphemes**
  - Spelling rules
  - Prefixes, suffixes, base words
  - Meaning and part of speech
  - Word history

- **Phonemic Awareness and Phonics**
  - Sounds/ letters
  - Syllables
  - Regular letter sequences/patterns
  - Blending/segmenting
Phonemic Awareness

Spoken words and syllables are made up of a sequence of sounds

Phonemic awareness is:

• the awareness of sounds in spoken words
• the ability to manipulate those sounds
• an essential precursor to spelling and reading
Effective instruction activities

Verbal/oral activities

• syllabification
• segmentation
• blending
• substitution
• additions
The most pedagogically sound method of phoneme awareness training is one that eventually makes explicit the complete letter-to-sound mappings in segmented words (Griffith and Olson, 1992)
Phoneme to grapheme: phonics

Sounds are regular:
- 50% words – regular sound/letter correspondence
- 37% words – one irregular letter pattern
- 4% words – totally unreliable

“Spelling” International Dyslexia Assoc, 2008
Consonants

- consonants
- consonant digraphs
- consonant blends – beginning and ending
- alternative spellings for consonant sounds
Spelling conventions - consonants

- ‘ff’ ‘ll’ ‘ss’ ‘ck’ ‘dge’ ‘tch’ (directly after short vowel) 1 syllable words
- c = /k/ or /s/
- g = /g/ or /j/; ‘gu’ words
- ‘qu’ = /kw/ or /k/
- ‘ch’ = /ch/ or /k/ or /sh/
Vowels = a, e, i, o, u (y)

• 5 vowels = 17 sounds (phonemes)

• 17 sounds = 44 spellings (graphemes)
Syllables

• each syllable has one vowel sound

• 6 syllable types

*Information about syllable types was the single most reliable key to vowel pronunciation*

(Shankweiler, D and Fowlcr, A 2006)
1. Closed syllables (50%)

- 1 vowel + consonant/s
- vowel will say its (short vowel) sound

Examples

<table>
<thead>
<tr>
<th>ap</th>
<th>op</th>
<th>et</th>
<th>ut</th>
<th>ig</th>
</tr>
</thead>
<tbody>
<tr>
<td>cap</td>
<td>lop</td>
<td>ret</td>
<td>lut</td>
<td>sit</td>
</tr>
<tr>
<td>stap</td>
<td>clop</td>
<td>cret</td>
<td>shut</td>
<td>stit</td>
</tr>
<tr>
<td>strap</td>
<td>clomp</td>
<td>crest</td>
<td>shunt</td>
<td>stilt</td>
</tr>
</tbody>
</table>
Effective instruction activities

Word Lists closed syllables
Oral and written
• highlight vowels
• sound out and blend
• read
• sort words into vowel groups
• verbalise sounds as writing letter/s
<table>
<thead>
<tr>
<th>/a/</th>
<th>/o/</th>
<th>/i/</th>
<th>/u/</th>
<th>/e/</th>
</tr>
</thead>
<tbody>
<tr>
<td>fab</td>
<td>yof</td>
<td>sig</td>
<td>rup</td>
<td>ped</td>
</tr>
<tr>
<td>nat</td>
<td>cos</td>
<td>wid</td>
<td>hux</td>
<td>lem</td>
</tr>
<tr>
<td>mag</td>
<td>bot</td>
<td>fim</td>
<td>dut</td>
<td>fet</td>
</tr>
<tr>
<td>dax</td>
<td>zog</td>
<td>nid</td>
<td>tup</td>
<td>jep</td>
</tr>
<tr>
<td>sap</td>
<td>mob</td>
<td>mit</td>
<td>fug</td>
<td>beg</td>
</tr>
<tr>
<td>nup</td>
<td>bol</td>
<td>hod</td>
<td>nuk</td>
<td>vil</td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>nic</td>
<td>dat</td>
<td>ret</td>
<td>bap</td>
<td>rof</td>
</tr>
<tr>
<td>sek</td>
<td>mig</td>
<td>fud</td>
<td>dit</td>
<td>deg</td>
</tr>
<tr>
<td>gat</td>
<td>fob</td>
<td>rab</td>
<td>com</td>
<td>gux</td>
</tr>
<tr>
<td>lum</td>
<td>jub</td>
<td>fid</td>
<td>mez</td>
<td>tad</td>
</tr>
</tbody>
</table>
Effective instruction activities

Letter tiles

• provide the vowel and consonant tiles for those sounds you have studied
• teacher says word/syllables. Student repeats and segments into phonemes, then build word/syllable with letter tiles. Touch each tile and say phoneme
• practice segmentation, substitution, deletion and addition of phonemes
## Chaining

<table>
<thead>
<tr>
<th>Chain 1</th>
<th>Chain 2</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>mot</td>
<td>blep</td>
<td>1. Instruct the student carefully as to the process</td>
</tr>
<tr>
<td>bot</td>
<td>blup</td>
<td>2. Only use the sounds you have taught</td>
</tr>
<tr>
<td>bop</td>
<td>brup</td>
<td>3. Only change one sound per word</td>
</tr>
<tr>
<td>bap</td>
<td>brip</td>
<td>4. Make your chains in advance</td>
</tr>
<tr>
<td>bip</td>
<td>brap</td>
<td></td>
</tr>
<tr>
<td>bep</td>
<td>brosp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bosp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bop</td>
<td></td>
</tr>
</tbody>
</table>
Effective instruction activities

Closed syllables: multisyllable words
Break words into syllables
1. Find the vowels
2. Start at the **end** of the word
3. Go past the vowel and take a consonant/s

Eg. **fantastic**

**fan** / **tas** / **tic**
ab/sent _____ab + _____sent____ = _____absent____
insect _______ + _______ = _____________________
fabric _______ + _______ = _____________________
dentist _______ + _______ = _____________________
conflict _______ + _______ = _____________________
infect _______ + _____ = _____________________
convent _______ + _____ = _____________________
helmet _______ + ___ = _____________________
indulgent _____ + _____ + ___ = _____________________
2. Open syllables 27%

- single vowel at the end of the syllable
- the vowel will ‘mostly’ say its **name** (long vowel sound)

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>i</th>
<th>o</th>
<th>u</th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>pa</td>
<td>si</td>
<td>bo</td>
<td>tu</td>
<td>de</td>
<td></td>
</tr>
<tr>
<td>pla</td>
<td>sli</td>
<td>blo</td>
<td>tru</td>
<td>dre</td>
<td></td>
</tr>
<tr>
<td>pra</td>
<td>sti</td>
<td>bro</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Double or not?

How do you say that?

• supper super
• dinner diner
• glutton gluton
Effective instruction activities

• practise reading mixed open and closed syllables lists – highlight the vowels

• make words with tiles
### Ambition in Action

<table>
<thead>
<tr>
<th>open ‘a’</th>
<th>open ‘i’</th>
<th>open ‘o’</th>
<th>open ‘u’</th>
<th>open ‘e’</th>
</tr>
</thead>
<tbody>
<tr>
<td>ba</td>
<td>ti</td>
<td>ro</td>
<td>tu</td>
<td>me</td>
</tr>
<tr>
<td>ra</td>
<td>bi</td>
<td>co</td>
<td>mu</td>
<td>te</td>
</tr>
<tr>
<td>sha</td>
<td>di</td>
<td>go</td>
<td>du</td>
<td>re</td>
</tr>
<tr>
<td>tha</td>
<td>tri</td>
<td>sho</td>
<td>flu</td>
<td>bre</td>
</tr>
<tr>
<td>cra</td>
<td>bli</td>
<td>tro</td>
<td>gru</td>
<td>gle</td>
</tr>
<tr>
<td>bla</td>
<td>swi</td>
<td>plo</td>
<td>stu</td>
<td>sme</td>
</tr>
</tbody>
</table>

[www.sit.nsw.edu.au](http://www.sit.nsw.edu.au)
<table>
<thead>
<tr>
<th>ad</th>
<th>ri</th>
<th>em</th>
<th>mas</th>
<th>vul</th>
<th>dis</th>
</tr>
</thead>
<tbody>
<tr>
<td>na</td>
<td>pen</td>
<td>ne</td>
<td>plu</td>
<td>gri</td>
<td>si</td>
</tr>
<tr>
<td>tis</td>
<td>lu</td>
<td>do</td>
<td>whim</td>
<td>fu</td>
<td>cab</td>
</tr>
<tr>
<td>e</td>
<td>ban</td>
<td>com</td>
<td>ab</td>
<td>ath</td>
<td>spro</td>
</tr>
<tr>
<td>op</td>
<td>en</td>
<td>bo</td>
<td>sup</td>
<td>wa</td>
<td>splin</td>
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<tr>
<td>pep</td>
<td>hu</td>
<td>ob</td>
<td>ro</td>
<td>hu</td>
<td>mol</td>
</tr>
<tr>
<td>mi</td>
<td>fe</td>
<td>gra</td>
<td>hin</td>
<td>cri</td>
<td>fa</td>
</tr>
<tr>
<td>sta</td>
<td>wis</td>
<td>clum</td>
<td>pro</td>
<td>fo</td>
<td>no</td>
</tr>
<tr>
<td>mis</td>
<td>le</td>
<td>in</td>
<td>kid</td>
<td>be</td>
<td>grub</td>
</tr>
<tr>
<td>rub</td>
<td>can</td>
<td>bla</td>
<td>De</td>
<td>ha</td>
<td>mo</td>
</tr>
</tbody>
</table>
Effective instruction activities

Syllable cards
- work in pairs or on your own
- make words by matching these syllable cards
- write the words you make on your syllable grid
Ambition in Action

regret + _______ = ________________
gluten + _______ = ________________
reflect + _______ = ________________
global + _______ = ________________
program + _______ = ________________
digest + _______ = ________________
humid + _______ = ________________
earct + _______ = ________________
romantic + + + = ________________
3. + e syllables

one vowel + consonant + e

the first vowel now says its **name** (long vowel sound); the e on the end is silent

<table>
<thead>
<tr>
<th>hat</th>
<th>hate</th>
</tr>
</thead>
<tbody>
<tr>
<td>bit</td>
<td>bite</td>
</tr>
<tr>
<td>pet</td>
<td>Pete</td>
</tr>
<tr>
<td>hop</td>
<td>hope</td>
</tr>
<tr>
<td>cut</td>
<td>cute</td>
</tr>
</tbody>
</table>

- these syllables are found at end of longer words but may be followed by a suffix eg engagement
<table>
<thead>
<tr>
<th>a-e</th>
<th>i-e</th>
<th>o-e</th>
<th>u-e</th>
<th>ee</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>time</td>
<td>tone</td>
<td>tube</td>
<td>seen</td>
</tr>
<tr>
<td>make</td>
<td>kite</td>
<td>vote</td>
<td>cute</td>
<td>meet</td>
</tr>
<tr>
<td>same</td>
<td>hive</td>
<td>code</td>
<td>dune</td>
<td>feed</td>
</tr>
<tr>
<td>hake</td>
<td>tike</td>
<td>chone</td>
<td>scune</td>
<td>creel</td>
</tr>
<tr>
<td>lape</td>
<td>lipe</td>
<td>crode</td>
<td>dube</td>
<td>theet</td>
</tr>
<tr>
<td>shabe</td>
<td>fline</td>
<td>stome</td>
<td>thupe</td>
<td>cleep</td>
</tr>
<tr>
<td>thane</td>
<td>trise</td>
<td>prote</td>
<td>spute</td>
<td>sween</td>
</tr>
<tr>
<td>ad</td>
<td>ri</td>
<td>eem</td>
<td>mase</td>
<td>ig</td>
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<td>-----</td>
<td>------</td>
<td>-----</td>
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<tr>
<td>na</td>
<td>pen</td>
<td>ne</td>
<td>plu</td>
<td>oc</td>
</tr>
<tr>
<td>tis</td>
<td>lu</td>
<td>do</td>
<td>whim</td>
<td>cobe</td>
</tr>
<tr>
<td>e</td>
<td>bane</td>
<td>com</td>
<td>ab</td>
<td>nug</td>
</tr>
<tr>
<td>ope</td>
<td>en</td>
<td>bo</td>
<td>supe</td>
<td>bri</td>
</tr>
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<td>pep</td>
<td>hute</td>
<td>obe</td>
<td>ro</td>
<td>vule</td>
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<tr>
<td>mi</td>
<td>fe</td>
<td>gra</td>
<td>hin</td>
<td>sele</td>
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<td>sta</td>
<td>wis</td>
<td>clume</td>
<td>pro</td>
<td>doc</td>
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<td>mise</td>
<td>le</td>
<td>ine</td>
<td>kide</td>
<td>scal</td>
</tr>
<tr>
<td>rub</td>
<td>can</td>
<td>bla</td>
<td>de</td>
<td>dist</td>
</tr>
</tbody>
</table>
Effective instruction activities

Segmenting sounds on grid paper

• listen to the word
• repeat the word
• segment the sounds and count with fingers-how many sounds?
• mark the grid
• write letters to match the sounds
## Phoneme-Grapheme Mapping
(A Method for Bridging Sound to Print)

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
</tr>
</thead>
</table>

Name: [Your Name]
Date: [Today's Date]

This grid can be used to practice mapping phonemes to graphemes. Each cell can be filled in with the corresponding phoneme and grapheme match.
Effective instruction activities

Syllable grid

• listen to word
• orally segment word into syllables – count number of syllables with fingers
• segment each syllable into phonemes and write matching letters
• in final column combine syllables to make whole word
<table>
<thead>
<tr>
<th>Syllable 1</th>
<th>Syllable 2</th>
<th>Syllable 3</th>
<th>1+2+3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
### Multisyllable word list closed, open, +e

<table>
<thead>
<tr>
<th>decompose</th>
<th>atmosphere</th>
<th>galvanise</th>
</tr>
</thead>
<tbody>
<tr>
<td>transfuse</td>
<td>juvenile</td>
<td>confiscate</td>
</tr>
<tr>
<td>complicate</td>
<td>compensate</td>
<td>cellulose</td>
</tr>
<tr>
<td>aptitude</td>
<td>concentrate</td>
<td>electrode</td>
</tr>
<tr>
<td>captivate</td>
<td>introduce</td>
<td>reproduce</td>
</tr>
<tr>
<td>presume</td>
<td>accurate</td>
<td>fascinate</td>
</tr>
<tr>
<td>illustrate</td>
<td>candidate</td>
<td>vaccinate</td>
</tr>
</tbody>
</table>
4. Vowels +r

Contain a vowel followed by an r. The r controls the sound of the vowel.

<table>
<thead>
<tr>
<th>ar</th>
<th>car</th>
</tr>
</thead>
<tbody>
<tr>
<td>or</td>
<td>for</td>
</tr>
<tr>
<td>er</td>
<td>her</td>
</tr>
<tr>
<td>ir</td>
<td>first</td>
</tr>
<tr>
<td>ur</td>
<td>turn</td>
</tr>
</tbody>
</table>
Effective instruction activities

Word/syllable lists

Develop fluent reading of word lists or text
• repeated practice of same words
• teacher listens to first reading and whenever possible after that
• student self times or teacher times reading for one minute
<table>
<thead>
<tr>
<th>pag</th>
<th>che</th>
<th>crope</th>
<th>gurp</th>
<th>thirm</th>
</tr>
</thead>
<tbody>
<tr>
<td>flort</td>
<td>sheg</td>
<td>bla</td>
<td>crube</td>
<td>thine</td>
</tr>
<tr>
<td>glame</td>
<td>sherg</td>
<td>drim</td>
<td>chi</td>
<td>tro</td>
</tr>
<tr>
<td>phu</td>
<td>cheem</td>
<td>starsh</td>
<td>pron</td>
<td>slub</td>
</tr>
<tr>
<td>chote</td>
<td>clat</td>
<td>spish</td>
<td>burst</td>
<td>shi</td>
</tr>
<tr>
<td>thu</td>
<td>skeep</td>
<td>slupe</td>
<td>blent</td>
<td>torn</td>
</tr>
<tr>
<td>firnt</td>
<td>tra</td>
<td>sme</td>
<td>spike</td>
<td>cresp</td>
</tr>
<tr>
<td>strug</td>
<td>clerg</td>
<td>clarp</td>
<td>bro</td>
<td>smale</td>
</tr>
</tbody>
</table>
Effective instruction activities

Anagrams

• use anagrams to look at regular letter patterns in English language and also to practise the vowel pattern being targeted
• teach strategies for solving anagrams
• rearrange the letters to make a word that contains the nominated vowel pattern
‘or’ words

robn _________ tkosr _________
rtfo _________ nocr _________
ofr _________ trspom _________
othrs _________ tnorr _________
thonhr _________ rotms _________
rkco _________ onhrt _________
5. Vowel teams

• **vowel pair**: team of letters that make a distinct long vowel sound

<p>| | | | |</p>
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<tbody>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>a-e</td>
<td>ai</td>
<td>train*</td>
<td>ay</td>
</tr>
<tr>
<td>ee</td>
<td>ea</td>
<td>sea*</td>
<td>y</td>
</tr>
<tr>
<td>i-e</td>
<td>igh</td>
<td>night*</td>
<td>y</td>
</tr>
<tr>
<td>o-e</td>
<td>oa</td>
<td>boat*</td>
<td>ow</td>
</tr>
<tr>
<td>u-e</td>
<td>ui</td>
<td>suit*</td>
<td>ew</td>
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</tbody>
</table>

*The first vowel says its name and the second is silent.*
5. Vowel teams

• **vowel dipthong**: vowel team that contains a distinct sound

<table>
<thead>
<tr>
<th>oo</th>
<th>book</th>
<th>oo</th>
<th>moon</th>
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</thead>
<tbody>
<tr>
<td>oy</td>
<td>boy</td>
<td>oi</td>
<td>noise</td>
</tr>
<tr>
<td>ow</td>
<td>cow</td>
<td>ou</td>
<td>out</td>
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<tr>
<td>aw</td>
<td>saw</td>
<td>au</td>
<td>August</td>
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</tbody>
</table>
Effective instruction activities

• introduce each vowel team one at a time
• use Effective instruction activities to practise all patterns
• teach that the vowel position in a word assists with spelling
• use sorting activity as a way to draw attention to the sound and/or letter patterns
The game of **rugby** was really **dynamic**. It was **probably** the **sympathy** of the crowd that urged the team to do better than their **typical** game. The coach was able to **justify** his use of the young **mystery** player he had brought in from another **Sydney** team.

*Sort the **y** words into the table to match the correct **y** sound. Don’t forget to look at the position of the **y** as well as listen to the sound.*

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>y</strong></td>
<td>/ee/</td>
<td>/ie/</td>
</tr>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
Effective instruction activities

Dictations

Before testing spelling – give student a copy

• student will study text
• highlight words with sounds that are being targeted
• break words into syllables
• find morphemes and base words
• find irregular words
Effective instruction activities

Dictations
- teacher says sentence slowly
- student repeat
- student makes a line for each word they will write
- when finished, student uses model of text and self corrects

NB: Oral repetition of phrases and sentences that are being written will reduce the load on working memory
Effective instruction activities

Self Dictation

- teach student to break sentences into chunks/ phrases
- say the phrase aloud, cover and write
Dictation

We had a delightful lunch on Sunday. The mayonnaise on my salad was fantastic but must have had an absolutely huge fat content. Of course the alcohol flowed freely.

I ran into an old acquaintance who had disappeared overseas many years ago and we had failed to maintain contact. His appearance hadn’t changed at all. For the remainder of the afternoon we entertained everyone with tales of our escapades.
6. –le syllables

End in ‘consonant le’ which sounds like /ul/

- ble able
- cle uncle
- dle handle
- fle rifle
- gle struggle
- kle ankle
- ple apple
- sle hassle
- tle rattle
- zle puzzle
The Schwa

• is an unaccented syllable which sounds like /u/ eg relative, cigarette.
• if you are not sure of which vowel letter to write for the schwa, go to another word in the same family
eg relate, cigar
Effective instruction activities

*Work out the missing vowel by thinking of another word from the same family which has a clearer pronunciation.*

- def_nition
- sed_tive
- expl_ation
- pr_servative
- inv_tation
- obl_gation
Useful resources

• engagemenow.wikispaces.com
Useful reading

- LDA of Minnesota – Net News
- Ldonline
- Reading Rockets.org
- Adlit.org
References

• *How Spelling supports reading: and why it is more regular and predictable than you think*
  
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