Use of ICT in assessing writing for National 3&4 Literacy

Scribes are not permitted as a reasonable adjustment when learners are required to show evidence of their writing skills in SQA National Literacy Units (see http://www.sqa.org.uk/sqa/64698.html) but the use of ICT is allowed:

> *"In order to minimise the disadvantage faced by some disabled learners in attaining the National Units in Literacy, the use of word processors and other assistive technologies such as screen readers, spell checkers or speech-recognition software would be acceptable as reasonable adjustments."*
> (Specification 3 - Literacy Units http://www.sqa.org.uk/sqa/64702.html)

Teachers, parents and learners have asked how ICT can be used to support assessment of writing skills in National 3 and 4 Literacy and in this guide we will look at some methods. You might also read our companion guide on using ICT for assessing reading available from the CALL Digital Assessment web site.

The task - meeting the standard for National 3 Literacy Writing

The *National 3 Literacy Unit Specification* states that:

> *"The purpose of this Unit is to develop the learners' reading, listening, writing and talking skills in a variety of forms relevant for learning, life and work. Learners will develop the ability to understand simple ideas and information presented orally and in writing. Learners will also develop the ability to communicate ideas and information orally and in writing with technical accuracy."*[1]

If we look specifically at the writing assessment standards, the required outcome from the Unit is that:

"The learner will:
3 Write simple technically accurate texts by:
> *3.1 Selecting and using appropriate language*
> *3.2 Organising writing appropriately*
> *3.3 Using appropriate spelling, punctuation and grammar"* [1].

Learners are expected to "*write simple formal continuous prose which:*

- "*contain a few ideas or a set of ideas;*
- *contain familiar vocabulary;*
- *uses simple expression;*
- *is more than 80 words in length.*" [2 p.20]

Note that assessment of literacy at National 3 or 4 is not 'an exam' – it is expected to be carried out in class as part of the learning and teaching programme.

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[1] National 3 Unit Specification: Literacy (National 3): H23W 73 http://www.sqa.org.uk/sqa/47502.html

An example of how a teacher might obtain evidence of writing ability is given in SQA's *Literacy 3 Unit Support Notes* [2 p.13]:

Assessment evidence	Outcome 1	1.1 Selecting and using relevant information	1.2 Identifying audience and purpose	1.3 commenting on effectiveness
Learner writes a section for a class web page	write simple technically accurate texts	Web page is written in simple language which makes sense to the reader	Web page uses an appropriate format/layout, is written in sentences and uses paragraphs/sections	Learner uses appropriate spelling, grammar and punctuation

In most cases, the writing assessment will follow on from previous work in class where learners will have read information about the topic and then undertaken assessment of their reading, talking and listening skills.

On their secure web site, SQA provide three example assessment packages for National 3 and three for National 4. These examplars give sample texts and questions and also guidance on assessment. Although many subject teachers will use assessment materials that they have created themselves, staff should review these exemplars to gain an understanding of the evidence that is required for the assessment.

In this guidance document, to provide a realistic context for how ICT can be used for the writing task, we are thinking of a scenario where the learners have been reading and learning about healthy eating.

In this example, then, a learner might be writing some text for a web page or a class leaflet about what they have learned about healthy eating.

Writing methods

For the assessment of writing skills, learners can write their 80 (National 3) or 300 (National 4) words using for example:

- handwriting;
- handwriting with transcription (i.e. where a member of staff re-writes the pupil's handwritten work);
- an electronic device such as laptop, iPad, tablet, mobile phone etc (with spellchecker);
- speech recognition software or other assistive technology.

The writing assessment is not done under 'exam conditions' – it is expected to be part of teaching and learning in class and it is not time-limited. When writing, learners can use a number of supports including:

- extra time;
- dictionaries;
- a practical assistant;
- a prompter;
- a reader. [3]

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[2] Unit Support Notes — Literacy (National 3), http://www.sqa.org.uk/sqa/47502.html

[3] Guide to supportive practices for National Literacy Units, http://www.sqa.org.uk/sqa/67310.html

Writing with ICT

SQA specify that ICT can be used by **all** learners for assessment of writing – it is not only those learners who have a difficulty or disability:

"Where resources permit, Centres should use technology as much as possible to support learning, teaching and assessment. For the Literacy Unit (National 3), this could include:

- *compiling and maintaining e-portfolios*
- *web-based research*
- *interactive language tasks such as cloze passages in electronic format*
- *word processing/proof-reading*
- *listening and responding to and/or creating webcasts*
- *games-based learning*
- *using chat rooms for discussion*
- *using virtual learning environments*
- *video conferencing*
- *discussing, reading and writing formal blogs*
- *reading and responding to e-mails*
- *submission of assessed work through VLE/e-mail online quizzes/tests*
- *mind mapping software*
- *internet voice calls*
- *web conferencing."* ([2, p. 10])

Can learners use a spellchecker?

Yes: all learners can use a spellchecker: *"Learners should be supported to spell words accurately, using a range of strategies and resources to do so. Commonly available support, such as an electronic spell checker and other technical support, is acceptable for on-screen writing."* ([2, p. 9])

Can learners submit more than one draft of their writing?

No: *"In writing, learners will produce technically accurate word-based texts which communicate meaning at first reading."* ([2, p. 9])

Is sentence structure and grammar assessed?

Yes: *"Learners should develop skills in structuring sentences in different ways, in using appropriate punctuation and in writing grammatically."* ([2, p. 9])

Can text-to-speech software be used?

Yes. Many learners find text-to-speech software very helpful for proof-reading their work. By having the text read back, learners can identify mis-spelled words and improve sentence structure and meaning.

Can mind-mapping [software] be used?

Yes: *"Learners should be encouraged to plan their writing, for example, by creating mind maps, through peer discussion or by considering options about content, layout and format. In planning and preparing for writing, learners will consider the genre, audience and purpose for their writing."* ([2, p. 8])

Writing Tools in Microsoft Word

Microsoft Word is the most commonly used word processor in Scottish secondary schools, and so we will look at tools and options within Word that can help learners with spelling or writing difficulties. The examples below are all done using Word 2010; other versions of Word have similar accessibility features.

Keyboard

Many pupils with visual, physical, learning or reading difficulties can use a keyboard to overcome difficulties with handwriting or spelling. For example:

- Learners who experience pain or fatigue when handwriting may be able to write more, faster and with less effort by using a keyboard.

- Learners can more easily edit and correct errors and so produce higher quality work as a result.

- Learners with very poor handwriting can produce more legible work with a computer (benefitting both markers and the pupil, who is able to read their own work more easily).

- Learners with dyslexia or reading difficulties can use built-in support tools such as spellchecker and AutoCorrect.

Solubility and Saturated Solution

When a solute is added to a solvent a solution is formed. How much solute we can dissolve depends on temperature of the solvent, the solvent yosed and the volume of the solvent. When a solution contains as much solute as it possibly can at that temperature, we say the solution is saturated. No amount of stirring or shaking will allow more solute to dissolve. Only by heating the solution or adding more solvent is it likely that more solute will dissolve.

Figure 1: A comparison of handwritten and typed text from a student with dyslexia

Spellchecker

Microsoft Word's spellchecker underlines words which may be mis-spelled. This draws attention to words which are likely to be mis-spelt, but perhaps more importantly it helps confirm correctly spelled words: many dyslexic candidates waste time going over words which are actually correctly spelt.

To spellcheck:

- Right-click on a word; if you see the correct spelling, click on it to replace it, or
- Click **Review > Spelling and Grammar**, or
- Press **F7**.
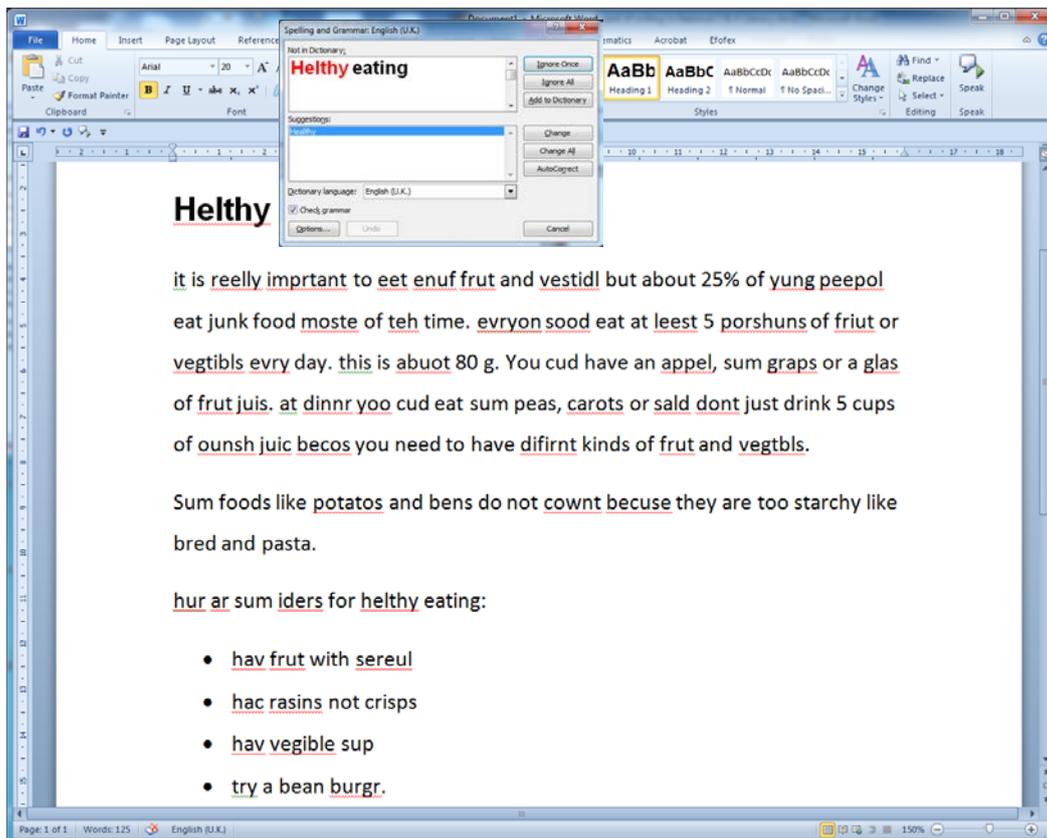
Figure 2: Microsoft Word's Spellchecker

Talking Spellchecker

To use a spellchecker, the writer must be able to identify the correct word in the list of words. Some learners with reading or word recognition difficulties have difficulty choosing the correct word from the list and so they benefit from having the word read out by the computer. A good option here is Rod Macaulay's WordTalk program which is free from www.WordTalk.org.uk.

With WordTalk, the learner can click on the words in the spelling list to hear it read out, and also find and listen to synonyms.

Talking spellcheckers are provided by many literacy support programs such as for example ClaroRead, Co:Writer, Ghotit, Read and Write Gold or Verity Spell.
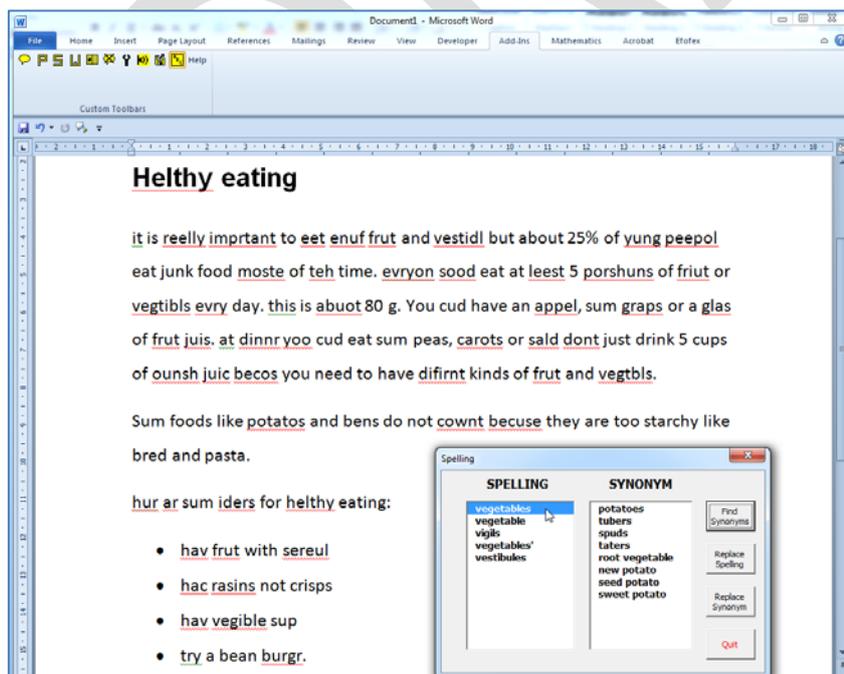
Figure 3: WordTalk Talking Spellchecker

Auto-correct

The Microsoft Word [AutoCorrect](#) tool corrects spelling or typing mistakes automatically. This can be extremely helpful for learners who make common spelling or typing mistakes: for example, it will replace 'teh' with 'the'; 'geting' with 'getting'; 'tecnical' with 'technical', and so on. Most writers use AutoCorrect without thinking or realising they are doing so.

To turn on AutoCorrect:

- Click **File > Options > Proofing > AutoCorrect Options** and tick **Replace Text as you Type**.

However, AutoCorrect can also be adapted or 'taught' to correct a writer's own personal spelling errors. For example, suppose a dyslexic learner cannot spell 'enough', and always types it as 'enuf' or 'anuf'. Both these mis-spellings can be added to the Word AutoCorrect dictionary so that both are automatically corrected.

To add words to the AutoCorrect dictionary:

- Click **File > Options > Proofing > AutoCorrect Options**. Type in the misspelling (enuf) under 'Replace', and the correct spelling (enough) under 'With'. Repeat for any other common mis-spellings of the same word.

Adding words one at a time in this way may seem like hard work, but it can over time develop into an extremely effective tool for helping learners with dyslexia write more accurately.
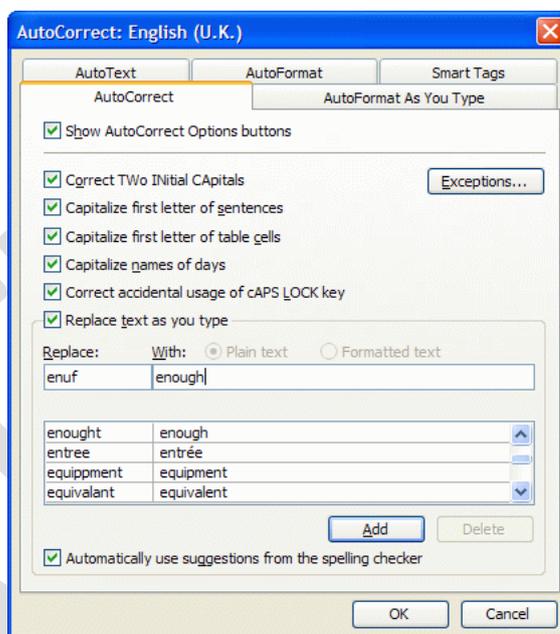
Figure 4: Adding words to the AutoCorrect Dictionary

An example

On the next page there is an example of writing (126 words - National 3 requires 80 words) about healthy eating typed with and without the use of AutoCorrect and the Word spellchecker. By using the spellcheckers the number of errors in this example is reduced from 50 to 9. However, there are also 8 'real word errors' or homonyms such as 'cud' instead of 'could'; 'sum' instead of 'some'; 'bred' instead of 'bread'; and 'sup' instead of 'soup'.

Note that this is given as an example to illustrate the type of spelling mistakes that can be addressed using the readily available Microsoft Word tools. Some learners with spelling difficulties find they can use these tools to greatly improve their spelling accuracy, but others, possibly with more severe literacy difficulties, find that spellchecking tools are not particularly helpful. For example, some learners with very severe literacy difficulties may require other supportive software such as word prediction or speech recognition (see below).

Schools therefore need to conduct an assessment of ability and need to determine the most suitable tool for the individual learner.

Helthy eating (without AutoCorrect or spellchecker)

it is reelly imprtant to eet enuf frut and vestidl but about 25% of yung peepol eat junk food moste of teh time. evryon sood eat at leest 5 porshuns of friut or vegtibls evry day. this is abuot 80 g. You cud have an appel, sum graps or a glas of frut juis. at dinnr yoo cud eat sum peas, carots or sald dont just drink 5 cups of ounsh juic becos you need to have difirnt kinds of frut and vegtbls.

Sum foods like potatos and bens do not cownt becuse they are too starchy like bred and pasta.

hur ar sum iders for helthy eating:

- hav frut with sereul
- hac rasins not crisps
- hav vegible sup
- try a bean burgr.

Healthy eating (with AutoCorrect and spellchecker)

It is really important to eat enough fruit and vestidl but about 25% of young peepol eat junk food most of the time. Everyone sood eat at least 5 portions of fruit or vegetables every day. This is about 80 g. You cud have an apple, sum grapes or a glass of fruit juis. at dinner you cud eat sum peas, carrots or salad don't just drink 5 cups of ounsh juice becos you need to have different kinds of fruit and vegetables.

Sum foods like potatoes and bens do not count because they are too starchy like bred and pasta.

hur are sum ideas for healthy eating:

- have fruit with cereal
- hac raisins not crisps
- have vegible sup
- try a bean burger.

How effective are spellcheckers in practice?

The example illustrates that a spellchecker is unlikely to help a learner correct all spelling mistakes errors - because spellcheckers:

- may ignore homonyms (for example *sum* for *some*, *her* for *hear*, or *who* for *how)*;
- do not always offer the correct spelling for an error;

and because the candidate may not identify the correct word in the list offered by the checker, only a proportion of spelling errors will be corrected.

Research suggests that 26% to 40% of spelling errors made by writers with spelling difficulties are not identified as an error by the spellchecker (MacArthur, 1996[4]), because they are homonyms. Some spellcheckers designed for writers with spellcheckers do check homonyms as well as mis-spelled words (see *Specialist Spellcheckers* later).

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[4] MacArthur, A., Graham, S. Hayes, J. A. & De La Paz, S. (1996) *Spelling checkers and students with learning disabilities, Performance comparisons and impact on spelling.* The Journal of Special Education 30, 1, 35-57.

According to a study by James and Draffan[5], the Microsoft Word spellchecker can identify and correct most (over 94%) of simple errors but is less effective when dealing with more severe errors of the type made by many writers with dyslexia. Specialist programs such as [ClaroRead](#), [Ghotit](#), [Co:Writer](#), [Ginger](#), [Read and Write Gold](#) and [Verity Spell](#) may be more effective in these situations.

MacArthur reported that just 36% of writers' errors were successfully corrected by using a spellchecker. However, 36% is better than 0%, and the Word spellchecker may well be all that is required for a learner to successfully achieve the standard for writing at National 3 or 4.

Make the text larger or smaller

Many learners with visual impairment or a reading difficulty, including dyslexia, benefit from a bigger font size both for reading text and when writing.

- Click **View > Zoom** to zoom in to make the text larger, or use the slider in the bottom right corner, or hold down **CTRL** and scroll the mouse.

- Click **View > Web Layout** and then zoom in to choose a large font size. Web layout will reflow the text so that you don't have the scroll left and right if you have high levels of magnification.

Change the page background and text colour

Learners who have visual stress or dyslexia may find text on a coloured background easier to access. Some learners with visual impairment may need a high contrast colour scheme (e.g. yellow on black) as well as magnification.

- Click **Page Layout > Page Colour** and choose a different page background.

- Select all the text (CTRL-A), click the **Home** ribbon and choose a different text colour.
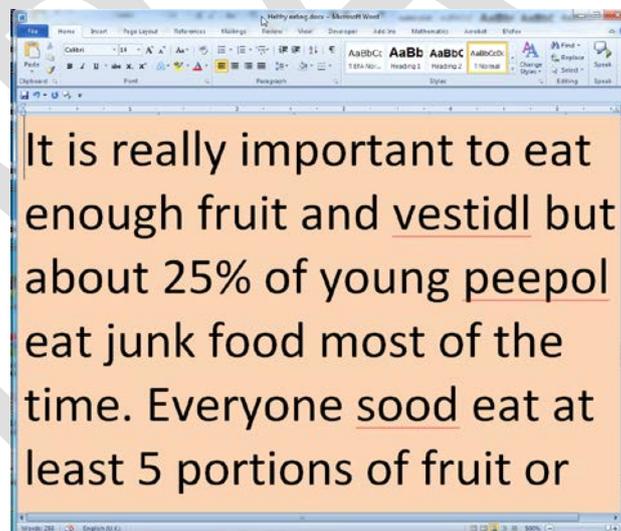
Figure 5: "Web layout" with zoom at 500%, pale orange background and black text

Change the font, font size and line spacing

Some learners find it easier to read text in particular fonts, or to see a larger font size:

- Select all the text (CTRL-A), click **Home** and choose a different font and/or font size.

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[5] The Accuracy of Electronic Spell Checkers for Dyslexic Learners, http://www.dyslexic.com/spell-checker-accuracy

Many learners with a visual impairment, visual stress, visual tracking problems or dyslexia can read and write more comfortably and fluently when each line of text is spaced further apart:

- Select all the text (CTRL-A), click **Home** and then the **Line and Paragraph Spacing** button, and choose the line spacing you want (try 1.5 or 2.0 for line-and-a-half, or double spacing).
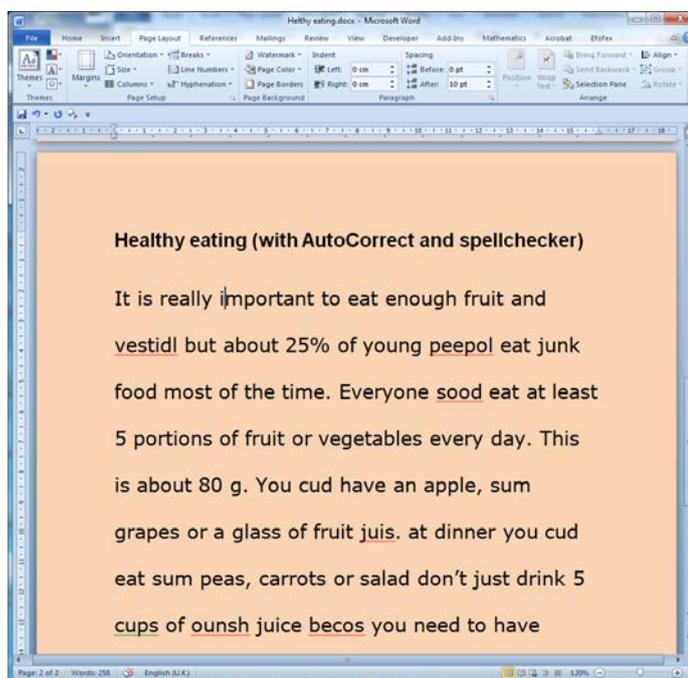
Figure 6: MS Word page with Verdana 18, coloured background, and double line spacing

Reading text with text-to-speech software

Many learners with literacy difficulties find that it is very helpful to use text-to-speech software both when writing and for reading back their text. While writing, some TTS programs can speak each word or sentence as it is typed, which can help the writer identify mis-spellings. Reading back the text with TTS may help the writer to improve punctuation, sentence structure, vocabulary or meaning.

There are many text-to-speech programs you can use to read text from a Word document, and we'll look at just two of them here by way of example. These tools are both free.

Text-to-speech programs need voices installed on your computer. Your PC will probably have one or two voices already installed, but the standard voices have American accents, so we recommend using the free Scottish computer voices from the web site at http://www.thescottishvoice.org.uk/. These are high quality male ('Stuart') and female ('Heather') voices which work with almost all text-to-speech programs on Windows and MacOS computers.

These voices are licenced for school and home use for learners in Scotland. Many local authorities have installed them on all their school computers as a reasonable adjustment under Equality and Accessibility legislation, and also as a tool for all learners. If you don't have them on your computers, ask your technical service to download and install them.

Word Speak button

Word 2010 and 2013 have a free text-to-speech tool called 'Speak'. To add it to the toolbar, follow the instructions in the blog post here: http://www.callscotland.org.uk/Blog/Blog-Post/?reference=333.

Once you have the Speak button in the toolbar, select the text you want to read and click **Speak**, and the text will be read out using the computer's default voice. The Word Speak button cannot read the text as you type.
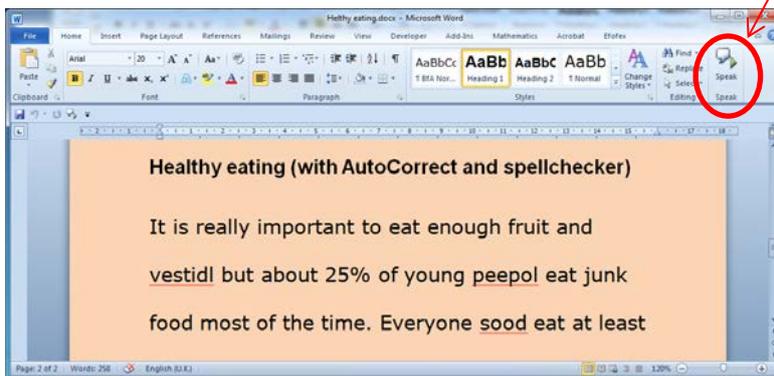
Figure 7: Reading text with Word's Speak button

If you want to change the default voice or the voice speed, open the **Speech Recognition Control Panel**, click **Text-to-Speech**, and choose the voice and settings you want to use. (If you cannot access the Control Panels, contact your technical service or school ICT coordinator.)
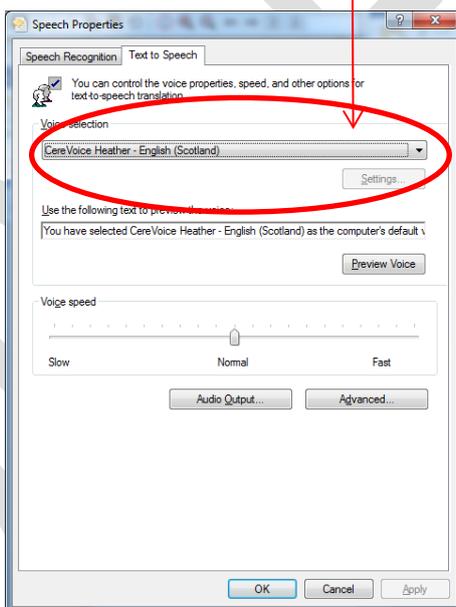
Figure 8: Changing the default computer voice for Word Speak button

WordTalk

WordTalk is a free add-on for Microsoft Word that gives more options and tools than the Word Speak button. For example, WordTalk highlights as it reads so the learner can track the text; it lets you change voices and voice speeds without having to access the Control Panels; it can echo back each word or sentence as you type; and learners who have difficulty with a mouse can use keyboard shortcuts. It also has a talking spellchecker and you can save text as audio files (for playing back on an iPod, for example).

WordTalk works with most combinations of Word and Windows. You can download it free from the web site: http://www.wordtalk.org.uk/.

Once you have WordTalk installed, click on the **Add-Ins** ribbon, place your cursor where you want to read, and click the relevant WordTalk button to read the paragraph, sentence, word, or the whole text.
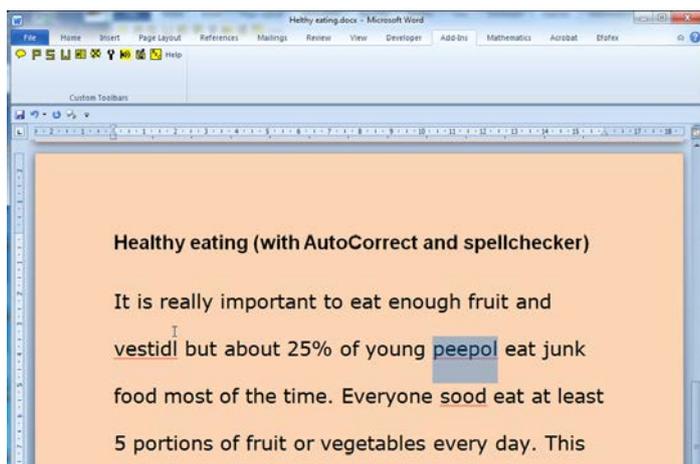
Figure 9: Reading text back with WordTalk
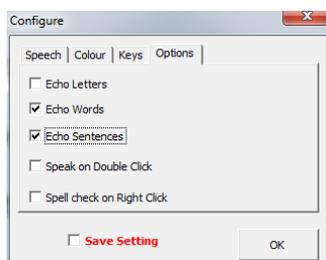
If you want to hear each word or sentence spoken back as you type, click the **'Spanner'** button then **Options** and tick the **Echo Words** and/or **Echo Sentences** button.

Figure 10: WordTalk 'Echo' tools

There are many free and paid-for text to speech programs you can use – too many to cover them all here – but we have listed some of the more popular tools below.

Text Readers

Text readers are mainly designed for designed for people who can see to click on or select text, and have it read out by the computer.

iVona MiniReader	Simple toolbar for reading from anything – Word, PDF, Internet etc.	Free
Natural Reader	Simple toolbar for reading from anything – Word, PDF, Internet etc.	Free
MyStudyBar	A set of accessibility tools including a text reader.	Free
ClaroRead	Comprehensive literacy support software. Text-to-speech; word prediction; talking spellchecker; easy font, spacing and colour adjustment; scanning etc. http://www.clarosoftware.com/	From £49
Read and Write Gold	Comprehensive literacy support software. Text-to-speech; word prediction; talking spellchecker; easy font, spacing and colour adjustment; scanning etc.	From £320
Co:Writer 7	Word predictor with text-to-speech. http://www.educationscotland.gov.uk/about/ordereducationresources/	£39 per licence
Penfriend	Word predictor with text-to-speech. http://www.educationscotland.gov.uk/about/ordereducationresources/	From £45 per licence

Screen Readers

Screen readers are designed for blind people. They operate quite differently from text readers and read out everything on the screen. They can all read Word documents.

NVDA	Free screen reader that can read Word and PDF files, the internet, and allow a blind user to access the computer.	Free
Jaws	Screen reader that can read Word and PDF files, the internet, and allow a blind user to access the computer.	From £659
Supernova	Screen reader that can read Word and PDF files, the internet, and allow a blind user to access the computer.	From £295

Other tools to support writing

The previous section summarised tools that are available or can be made easily available within Microsoft Word. In this section we will discuss other programs and tools that can support writing. Most of these can be used to type into Word.

Specialist Spellcheckers

There are several 'specialist' spellcheckers that are designed specifically for learners with spelling or literacy difficulties, such as ClaroRead, Ghotit, Read and Write Gold and Verity Spell. These may give better results than the Word spellchecker depending on the type of spelling mistakes that the learner typically makes.

A comparison of these programs is available on the CALL web site and the BDA Technology web site also has summaries.

Word prediction

Word predictors analyse text as it is typed on the computer, and try to 'predict' the words that the learner is most likely to want from a dictionary or lexicon of words. The writer types or selects a letter and the program offers a list of the most common words beginning with that letter. If the required word is on the list, the writer selects it with mouse, keyboard or other access tool. If the word is not on the list, the learner types the next letter and a different choice of words is offered.
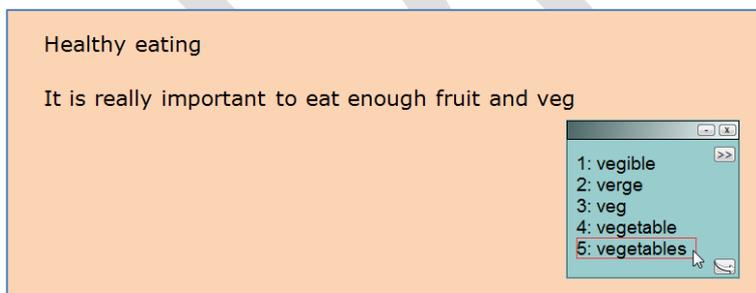
Figure 11: Writing with word prediction

There are many word prediction programs available, including Co:Writer, ClaroRead, LetMeType, Penfriend, Read and Write Gold and Write:Online. Some Scottish local authorities have authority-wide licences for some of these programs. There are prices and sources on the next page.

Word prediction can reduce the number of keystrokes needed to type by up to 50% and so learners with physical disabilities use them to reduce effort and increase endurance and therefore the amount that can be written in one session.

Word prediction can also help learners with even quite severe spelling difficulties because the writer only needs to type the first few letters of the word and then select it from the list of words offered. The learner can usually point at the word to have it read out, to make sure it is the correct word.

Some literacy skills are necessary to be successful with word prediction. The writer must be able to decide what they want to say, type a reasonable approximation to the first few letters of the word and then recognise the word in the list. Some writers cannot get the first letters right; others may miss the word when it is offered in the list or choose a different one by mistake. Some pupils also find that shifting attention between the text, the keyboard and the predicted list interrupts their flow of thought and slows them down.

Word prediction in assessment of literacy

At time of writing we believe that SQA will regard word prediction as a reasonable adjustment but this is not confirmed. Note that the predictor should only offer single words, not phrases or sentences.

Word prediction & specialist spellcheckers

MyStudyBar	A set of accessibility tools including the LetMeType predictor.	Free
ClaroRead	Text-to-speech; word prediction; talking spellchecker; easy font, spacing and colour adjustment; scanning etc. http://www.clarosoftware.com/	From £49 for single user licence
Co:Writer 7	Word predictor with text-to-speech. http://www.educationscotland.gov.uk/about/ordereducationresources/	£39 for single user licence
Ghotit	Context and phonetic spellchecker, grammar checker, word prediction, text-to-speech. Requires internet connection.	Free basic version; single user £128.
Penfriend	Word predictor with text-to-speech. http://www.educationscotland.gov.uk/about/ordereducationresources/	£45/£90 for first licence; £15/£22 for additional licences.
Read and Write Gold	Text-to-speech; word prediction; talking spellchecker; easy font, spacing and colour adjustment; scanning etc.	£320 for single user licence
Verity Spell	Phonetic spellchecker, homonym checker and dictionary.	£70 for single user licence.
Write:Online	Word processor with text-to-speech, word banks and prediction.	£150 for single user licence.

Speech Recognition

Speech recognition software, where the learner speaks and the computer or device recognises the speech and converts it into text, is regarded as a reasonable adjustment for assessment of writing for National 3 or 4 Literacy.

Speech recognition is provided free with Windows 7 and 8, recent versions of MacOS, and is also built in to the iPad (Mini and iPads 3 or 4 with retina display).

The Dragon speech recognition software is also available for Windows, Mac and iOS and the latest Dragon NaturallySpeaking for Windows claims to be 'up to 99% accurate out of the box'.

Finally, [WordQ + SpeakQ](#) is designed specifically for writers with literacy difficulties and integrates speech recognition, word prediction and text-to-speech.

Certainly, speech recognition software is far more accurate, and requires far less training, than was previously the case, but it is still not commonly used in schools.

Learning to use speech recognition does require time, effort and support and good ICT and language skills. The writer must be able to compose satisfactory English and to dictate clearly and accurately. Learners with strong dialects or regional accents, or unclear speech may not be able to use the software. Speech recognition is unlikely to be 100% accurate, and so the writer must be able to read back the dictated text and identify and correct mis-recognised words.

You can find out more about speech recognition from:

- [Speech Recognition Software](#) from http://bdatech.org/what-technology/speech-recognition/
- [Solutions for Learning Challenges](#) from http://www.nuance.com/dragon/accessibility/dragon-dyslexia-learning-challenges/index.htm
- *[Speech Recognition in National Assessments - Update August 2013](#)* and
- *[Speech Recognition Software in SQA Assessments](#)* from

http://www.adapteddigitalexams.org.uk/Downloads/Reports-and-Presentations/

What about learner's who cannot use standard keyboard or mouse?

Learners with physical disabilities who cannot use a standard keyboard or mouse may be able to write by using an alternative method of access, such as speech recognition; mini or large keyboard; or an on-screen keyboard controlled with a mouse, trackball, joystick, head-operated mouse, eye-gaze or switches).

Finding the most efficient and effective method of access usually requires specialist assessment and trial of different options from an organisation such as CALL Scotland.

[The use of Communication and Assistive Technologies for disabled candidates in Assessment,](#) written by CALL staff, provides an overview of access and other technologies for learners with disabilities.

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