

# Teaching learners with special educational needs and additional support needs

Susie Nyman with Rob Butler

## Susie's Science Literacy toolbox for SEND students

Susie Nyman teaches at the Sixth Form College, Farnborough. She has put together a toolbox of strategies and resources to help teachers of learners with special educational needs, and is well known for her multi-sensory strategies. Susie shared some of her ideas with the Inclusive Science Education Group.



Susie opened with pen portraits of her learners. She told us of one learner who needed a giant A1 graph of the menstrual cycle, using strawberry laces, to help visualise it in his head. Another learner needed to break down words into components and then relate the learning of them to their prior experiences. A favourite whole-class activity is playing the 'weakest link', using mini-whiteboards, as a show-and-share activity to test if students have learned concepts. Susie made the point that there are many ways to teach science; it isn't just about textbooks and classic experiments.



## Vocabulary

Glossaries of terms are useful to learners, Susie puts them at the start of each student's book, but we should remember that they need to be actively used to be effective. You can use Post-it notes with these glossaries to group ideas and self-test words, for example.

Science terminology can be quite challenging for learners. To help with this, we can break down challenging words into prefixes, roots and suffixes, which help learners to make sense of complicated words. For example, 'chloro' means green, 'photo' means light, 'poly' means many, and so on. This can help students to understand words, and understanding can also help them to select the correct terminology to use, particularly for tricky terms such as hypo/hyperglycaemic. There are many words that can be made easier to understand through the etymology, for example 'arthro', meaning related to joints (arthropods, arthritis) or 'osis' meaning process (as in osmosis, mitosis).



When teaching new terminology, Susie suggests the following strategies:

- Speak and use the words out loud;
- Write words on interactive and mini-whiteboards;
- Break down words into parts, e.g. 'o-eso-pha-gus' and write them down on coloured Post-It notes using different coloured pens;
- Repeat the words a few times;
- Discuss the etymology of the word, for example, the Greek 'stoma', which means mouth;
- Give an example in a sentence; and
- Regularly revisit the terminology using games, e.g. Bingo, or the 'weakest link'.

## Strategies

A typical sequence of activities might look like this (Figure 1):

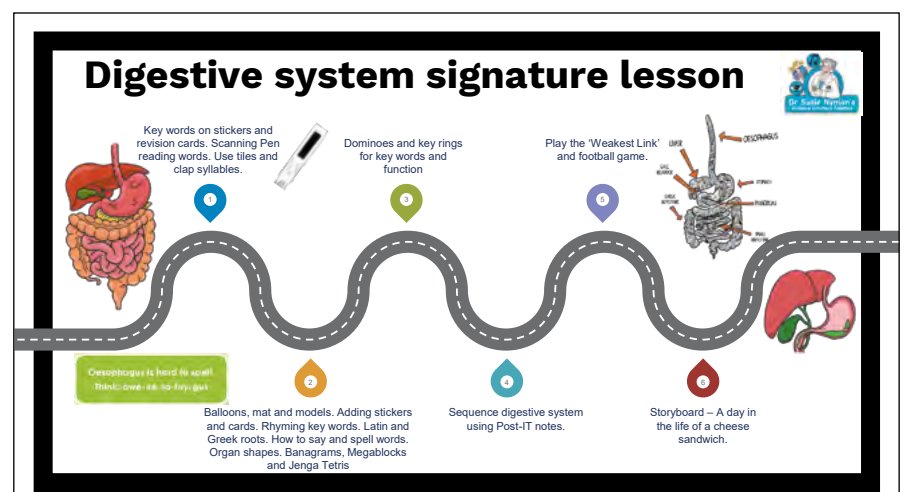
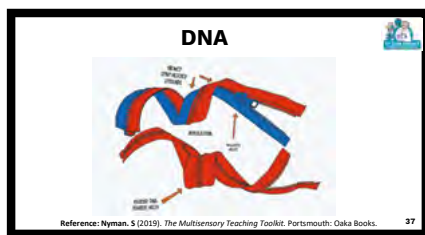


Figure 1.

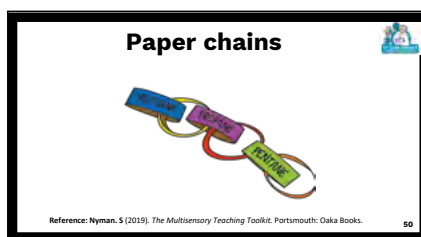
Susie has a giant mat of the heart, which can be used in different ways: labelling parts, modelling flow of blood and explaining the vocabulary. Using little aids to memory can help students remember sequences; for example, reminding learners 'to try before you buy' can help them to remember 'tricuspid before bicuspid'.

There are tactile/multi-sensory strategies, included modelling DNA by using double-ended zips (available from John Lewis) to help students understand what is happening during replication. Susie also uses card sorts to match circuit symbols to their names so that students remember them, and strawberry laces to plot distance-time graphs on pre-created axes. Playdoh is a really good material with which to model the digestive system, because it stimulates all of the senses.



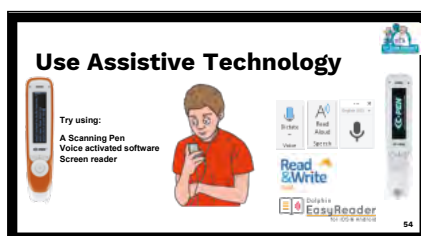
The Periodic Table of elements can be made tactile by using a large shower curtain or physical pottery models with which the students can interact. You can extend this by physically modelling electron configuration using marbles, and model organic compounds using lollipop sticks (these are useful to show

the double bonds). Paperchains can be used to link a sequence of alkanes together to help learners to remember their names.



All these activities include a multi-sensory component.

Susie reminded us that assistive technology is incredibly powerful, whether using reading/scanning pens or software such as *Read & Write Gold* or *Dolphin Easyreader*.



Susie emphasised that learners need to believe in themselves; she always tells her learners 'If you can believe, you can achieve'.

## Take-away messages

- Some students learn best with a multi-sensory experience. How can we build those into our teaching?
- How can we relate learning to real life?

- What strategies can we use to help learners understand and remember?

## Useful links from the workshop

<https://www.oakabooks.co.uk>

<https://edu.rsc.org/feature/how-to-help-students-decode-science-vocabulary/3010205.article>

<https://www.bbc.co.uk/bitesize/articles/z8fdr2p>

From the British Dyslexia Association:

<https://www.youtube.com/watch?v=blzZzbrlK9c>

Multi-sensory teaching:

<https://www.youtube.com/watch?v=0r5i4c7OLDk&t=29s>

**Susie Nyman** teaches at the Sixth Form College, Farnborough. She came to the Inclusive Science Group to share some of the ideas that she presented at ASE's International Day.

@DrSusieNyman on Twitter

E-mail:

[snyman@farnborough.ac.uk](mailto:snyman@farnborough.ac.uk)

## Summary

The student

Decoding Science vocabulary  
Structure of Science words  
Tried and tested ways to remember Science

Signature lesson  
Susie's resources

58

The Inclusive Science Group is made up of interested educators from all phases and sectors who have an interest in teaching students who have additional support needs or special educational needs. It is organised by Rob Butler from ASE and Jane Essex (ASE and RSC member), who both have an interest in this area of science education. Membership of this group is open to anyone, and attendance at the meetings is optional. Notes taken during the discussion will be shared with the whole group.

You can join by filling in the form at:

<https://www.ase.org.uk/ise>