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National Association for Language Development in the Curriculum

the national subject association for EAL

Teaching EAL in the mainstream secondary curriculum –

Secondary Classroom Vignette 4

Subject and topic	**Science: Acids and Alkalis** **NC: Materials and their Properties; Patterns of Behaviour; Acids & bases**
Key Stage	KS 3
Focus pupils and school	A multi-ethnic 16-19 comprehensive school for girls, with approximately 50% of pupils coming from homes where English is not the first language. Some of the pupils with family connections to the Indian sub-continent quite often return there for extended periods of time. A Year 8 class, which includes one pupil who arrived from Angola three months ago. She speaks Portuguese, and when she first arrived spoke no English.
Context	The pupils are learning about pH as a measure of acidity of a solution, and how to use indicators to classify solutions as acidic, neutral or alkaline.

The example

The science teacher is working alone without a support teacher. However, she liaises with the staff in the EAL department on planning and materials development. The science teacher is keen that pupils, especially those who may initially have a limited proficiency in English, be guided at first into producing the written discourse appropriate to the subject area. She plans to include the EAL learner in the lesson via small group work when, in groups of three, the pupils test a range of substances: the EAL learner has been assigned to a friendly and supportive group. The teacher, however, is more concerned about how the pupil will write up her initial observations. These will then form part of a more formal Method – Results – Conclusion write-up. She seeks advice from an EAL teacher who offers a suggestion which will help the pupil write some appropriate statements. The pressure of time, however, does not allow for a more detailed discussion regarding how best to support the longer, more formal write-up.

As the pupils test a range of substances, they record their results in a table similar to the one below:

Substance	Colour	pH value	Acid / Alkali / Neutral
Vinegar	pink	5	acid
Sodium hydroxide		12	alkali
Hydrochloric acid	red	1	acid

The suggested strategy here is, on completion of the table, to give the EAL learner a model sentence (e.g. 'Vinegar has a pH value of 5'), and then ask her to produce further written statements, based on the information the group have in their table. Once the learner has produced her set of statements, the teacher then provides a list of further sentences similar to the ones below,

- It is a strong acid
- It is a weak alkali
- It is a stronger alkali than …
- It is a weaker acid than …

and invites the pupil to match up their sentences to ones which might logically follow.

Thus at the initial writing stage, the pupil has been guided into producing patterns such as the following-

Vinegar has a pH value of 5.
It is a weak acid.

The benefits of this strategy for the pupil are:

- Consolidation of the lesson content (via alternative written access).
- Practising sentences typical of the subject (e.g. simple, active, declarative sentences).
- Production of units of discourse appropriate to science (e.g. a generalised statement, followed by one which either elaborates, clarifies or exemplifies).

Unfortunately, the lack of time allocation and staffing in this particular case precludes the further assistance which will help the learner with the more formal write-up, although both teachers concerned are fully aware of the need to do so. The teachers agree that they should bear this language development aspect in mind.

Developing Writing

At a later point in the science course, and following further consultation with the EAL department, the following support sheets are provided which are designed in order to further develop two key areas in the writing up of practical work:

- **Use of the past tense** form of the verb in reporting (Example 1 - "Putting Two Compounds Together")

- **Explicit knowledge of the genre** associated with an 'investigations' write-up (Example 2. – "Reaction when adding Calcium carbonate to Hydrochloric acid")

The examples below, showing the support materials, were used in both cases following the practical experiments carried out. Example 2, in particular, is an illustration of when the science writing is reflecting the *actual* learning experience in the classroom, helping the pupil to remember what she did by including aspects of both formal and ordinary classroom language (e.g. 'Method' / 'what we did').

Assisting the learner involved here to capture and revisit what they did in the classroom via the text provided by the teacher, helped to make both the learning experience and the associated language all the more meaningful.

Example 1

Putting Two Compounds Together

Copper oxide and Sulphuric acid (hydrogen sulphate)

Words

copper oxide - looks like black powder

dilute - with water added

Method

(what we did)

We began with two test tubes, one had copper oxide in it, and the other _____

dilute sulphuric acid. We slowly _____ the copper oxide into the sulphuric

acid. The sulphuric acid started to turn a blue colour. We kept on pouring until some

black powder (the copper oxide) _____ on the bottom. We then

_____ filter paper and a funnel to filter the mixture into a flask. We poured

this into an evaporating dish and _____ it for the water to evaporate.

Missing verbs

used poured left had had collected

Example 2

Experiment to see the Reaction when adding Calcium Carbonate to Hydrochloric Acid

This experiment is described below, but the headings have been left out. Fill in the correct headings from this list into the boxes below. Write a heading in each box:

Conclusion **what we did** **what we think will happen** **Method**

Results **Prediction** **what we saw** **what we learned**

We think a gas will be produced and that this gas will be carbon dioxide (CO2). The test for this gas is to light a splint, put it into the gas and see if the flame goes out.

We put some calcium carbonate (a white powder) into some hydrochloric acid. We did this slowly so that it wouldn't fizz up too quickly. We put our thumb over the top to trap the gas and keep the pressure there. We lit a splint and put it inside the test tube.

The lighted splint went out.

The gas produced was carbon dioxide. Our prediction was correct.