

The challenges of providing practical science for ASN pupils

When our local ASN school approached me for help and advice in enhancing their science lessons I realised just how isolated these teachers can be. Not being sure where to turn for advice I realised this is where the strength and advantages of the STAC group could come in to play. It occurred to me that every local authority would likely have at least one ASN school facing the same challenges, and that this would be an ideal opportunity to pool ideas and solutions.



An email to STAC brought immediate responses from Glasgow, Edinburgh, Inverclyde and Dumfries & Galloway with technicians willing to share their own experiences. It seemed that the range of challenges was vast and covered the specific needs of pupils and the particular staffing in the schools.

Challenges of practical science for ASN pupils

Engagement

- Possible limited attention span – break lesson up into manageable sections
- Understanding – simplify language in science lessons to be easily followed
- Following instructions – uncluttered, clear instruction, preferably pictorial
- A role for everyone – if unable to participate fully can each pupil have a role?
 - Can they physically participate?
 - Can they read out instructions?
 - Can they make observations?
 - Can they write or narrate results?

Physical ability

- Visual impairment – can they be paired with someone to talk through process?
- Enlarge scales on beakers etc.
- Large text, simplified work cards
- Mobility – are there tasks that can be undertaken sitting down ie taking results, giving instructions?

Confidence

ASN pupils may **lack confidence** and need to be given tasks they are comfortable taking part in.

Safety

- **Unpredictable behaviour** – materials must be such that they cannot cause harm if used inappropriately
- Provide plastic versions of glassware where possible
- Enhanced risk assessments for ASN practical work with all above observations taken into account.
- **Limited dexterity** – equipment chosen to be easy to handle, chemicals selected to be safe if spilled
- Some schools had pupils with **attendance issues**, little or no self-esteem and emotional problems.
- Other schools had many and varied **physical problems**, but a full range of mental capacity and capability
- Whilst some schools had a **specific science teacher**, others did not.
- Most of the schools had **no science technician** support or science storage facilities.

The following points were shared:

From a science teacher:

- The use Makaton signing and boardmaker symbols is useful.
- The biggest help and support is having a learning assistant in class with you.
- Base groupings on mixed ability so that everyone can get involved. I will ask questions to gauge understanding, sometimes with boardmaker symbols to help understanding and provide choices of answers.

From a science technician supporting an attached unit:

As a technician the 'Safety' section is the most relevant and the section which I have most input.

Try to adapt the BGE courses followed by the main stream pupils as much as possible so that the practical's still feel "experimental, scientific and purposeful" rather than 'arts and crafty'. Some of the practical's for the main stream pupils involve plasticine and straws – making greenhouses etc which the ASN pupils also do.

- Use plastic labware where possible.*
- Large/easy read scales are also important. Budgets can be a limiting factor in apparatus procured.
- The science lab used has been adapted with a sink which lowers for wheelchair users for example. Bunsen burners with longer leads were a consideration to allow wheelchair users but this has been unsuccessful as tubing longer than SSERCs recommendation would be required. A

specific risk assessment may make this safe where the benefits to the learner would outweigh the risks.

- A lot of contamination of chemicals occur with special needs pupils so I have tried to colour coordinate lids to try to minimise this. Minimising the amount of chemicals given in bottles also seems sensible but with dexterity challenges etc, more chemicals are required than perhaps for main stream pupils, so this is a bit of a trade-off and difficult to predict.
- Whilst exact measured quantities might help, that needs to be weighed up against the additional preparation time, which may be in a school with no technician support.

At this early stage of collaboration it seems that some level of technician support is essential for their knowledge, loan of kits where there are no storage facilities and their experience of main stream lesson adaptations.

We now have teams working on adapting main stream practical activities for a variety of ranges of additional needs as well as producing a simple course of science tester practical lessons for interrupted learners which cover a range of topics and can be taught by a non-science specialist. Specific risk assessments for the special circumstances will also be written to accompany these, as well as a clear protocol and pupil worksheets incorporating pictorial instructions.

We are at an early stage with this work, but if there are any others out there who feel they would benefit from this collaboration, or who have more to contribute, please contact your STAC representative who will put you in touch with us.

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* A bit of google research found that Fisher Scientific sell a range of good quality plastic lab-ware that has so much more than the usual plastic beakers and measuring cylinders. Their range includes standard flasks, centrifuge tubes, guaranteed leak-proof bottles and even desiccators. Some of the equipment is even autoclavable. Whilst an expensive set up cost, this equipment is near indestructible.