Identifying High Potential Learners in Science

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ADVICE SHEET

Summary
This advice sheet contains a checklist, originally compiled by the QCDA (Qualifications and Curriculum Development Agency), of criteria to help with identifying students who are demonstrating high learning potential in Science. It is aimed at secondary school subject teachers, as well as high learning potential lead teachers.

Below is a list of the characteristics commonly shown by learners who demonstrate high learning potential in science. A learner need not be showing all of these to be considered high potential learners, but would most likely be demonstrating a majority of them.

Learners who have high learning potential in science:

- Are imaginative
- Read widely, particularly Science or Science Fiction
- Have scientific hobbies and/or be members of scientific clubs and societies
- Are extremely interested in finding out more about themselves and things around them
- Enjoy researching obscure facts and applying scientific theories, ideas and models when explaining a range of phenomena
- Are able to sustain their interest and go beyond an obvious answer to underlying mechanisms and greater depth
- Are inquisitive about how things work and why things happen (they may be dissatisfied with simplified explanations and insufficient detail)
- Ask many questions, suggesting that they are willing to hypothesise and speculate
- Use different strategies for finding things out (practical and intellectual) – they may be able to miss out steps when reasoning the answers to problems
- Think logically, providing plausible explanations for phenomena (they may be methodical in their thinking, but not in their recording)
- Put forward objective arguments, using combinations of evidence and creative ideas, and question other people's conclusions (including their teacher's!)
- Decide quickly how to investigate fairly manipulative variables
- Consider alternative suggestions and strategies for investigations

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• Analyse data or observations and spot patterns easily
• Strive for maximum accuracy as possible (sometimes beyond the accuracy of the instrument)
• Make connections quickly between facts and concepts they have learned, using more extensive vocabulary than their peers
• Think abstractly at an earlier age than usual and understand models and use modelling to explain ideas and observations
• Understand the concepts of reliability and validity when drawing conclusions from evidence are easily bored by over-repetition of basic ideas
• Enjoy challenges and problem solving, often while being self-critical
• Enjoy talking to the teacher about new information or ideas
• Are self-motivated, willingly putting in extra time – (but they may approach undemanding work casually and carelessly)
• Show intense interest in one particular area of Science (such as astrophysics), to the exclusion of other topics.

Further Information

www.le.ac.uk/slcem/topics/gifted-and-talented.html	Article from Science Learning Centres about teaching pupils who are gifted and talented in Science
http://webarchive.nationalarchives.gov.uk/20110809101133/http:/nsonline.org.uk/node/175277	Archived National Strategies Module 17: Supporting gifted and talented provision in secondary science
Meeting the Needs of Your Most Able Pupils in Science by Tim Alderman	Book published by David Fulton with guidance on identification, planning, differentiation and support. Also has CD with lesson plans.
Science Education for Gifted Learners by Keith S Taber	This book asks what classroom teachers can do to make sure that their science teaching is stimulating and challenging for their students

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