

CFE TOPIC	LEVEL	FUTURE SKILLS	DESCRIPTION	RESEARCH TOPICS	INFORMATION LITERACY FRAMEWORK LEVEL (S) (Note – levels where skills sought appear to be above age/stage are in bold)
Energy sources and sustainability [Learners] “consider the relevance of these concepts to everyday life”	3	Adapting communication, ICT E-Lit, note taking, objective reporting, presentational skills, self projection, setting information out, sharing ideas, analytical skills, big picture connections, current affairs awareness, future orientation, gathering facts, image modelling, networking connections, objective rational thinking, perceptive interpretation, processing information, participation, efficiency, focus on task, reaching conclusions, discovering, assimilation, open to discussion, weighing up different points of view	Through investigation, I can explain the formation and use of fossil fuels and contribute to discussions on the responsible use and conservation of finite resources. SCN 4-04b	Fossils fuels	Up to and including P31-32
	4	Adapting communication, ICT E-Lit, note taking, objective reporting, presentational skills, self projection, setting information out, sharing ideas, analytical skills, big picture connections, current affairs awareness, future orientation, gathering facts, image modelling, networking connections, objective rational thinking, perceptive interpretation, processing information, participation, efficiency, focus on task, reaching	By contributing to an investigation on different ways of meeting society's energy needs, I can express an informed view on the risks and benefits of different energy sources, including those produced from plants. SCN 4-04a	Fuel & Energy sources including plants	Up to and including P31-32

		conclusions, discovering, assimilation, open to discussion, weighing up different points of view			
Processes of the planet	3	Adapting communication, ICT E-Lit, objective reporting, sharing ideas, setting information out, analytical skills, big picture connections, current affairs awareness, future orientation, gathering facts, image modelling, objective rational thinking, perceptive interpretation, processing information, participation, focus on task, reaching conclusions, discovering, independent working, assimilation, weighing up different points of view.	I can explain some of the processes which contribute to climate change and discuss the possible impact of atmospheric change on the survival of living things. SCN 3-05b	Climate change, living things, global warming	Up to and including P31-32
Space	3	Adapting communication, ICT E-lit, objective reporting, setting information out, analytical skills, current affairs awareness, gathering facts, image modelling, networking connections, objective rational thinking, perceptive interpretation, synthesising skills, participation, focus on task, reaching conclusions, discovering, independent expression, independent working, assimilation	By using my knowledge of our solar system and the basic needs of living things, I can produce a reasoned argument on the likelihood of life existing elsewhere in the universe. SCN 3-06a	Solar system, living things; life on other worlds	Up to and including P31-32
Space [Learners] “develop their understanding of how our knowledge of the universe has changed over time and explore ideas of future space exploration and the	4	Adapting communication, ICT E-Lit, objective reporting, presentational skills, setting information out, analytical skills, gathering facts, processing information, efficiency, discovering, independent working	By researching developments used to observe or explore space, I can illustrate how our knowledge of the universe has evolved over time. SCN 4-06a	Space observation. Space exploration Space telescopes (Hubble)	Up to and including P31-32

likelihood of life beyond planet Earth. “					
Body systems and cells	3	ICT E-lit, Analytical skills, current affairs awareness, gathering facts, objective rational thinking, processing information, discovering, independent working	I have explored the role of technology in monitoring health and improving the quality of life. SCN 3-12b	Technology in health, - - e g pacemakers, etc	Up to and including P31-32
Body systems and cells {Learners} “develop informed views on the moral and ethical implications of controversial biological procedures.”	4	Adapting communication, empathetic skills, ICT E-lit, note taking, objective reporting, self-projection, setting information out, sharing ideas, summarising skills, vocabulary, analytical skills, current affairs awareness, gathering facts, image modelling, big picture connections, objective rational thinking, perceptive interpretation, processing information, reaching conclusions, discovering, independent expression, assimilation, open to discussion, weighing up different POV	I can debate the moral and ethical issues associated with some controversial biological procedures. SCN 4-13c	Sustainability of human life. Morals and ethics. Euthanasia	Up to and including P31-32
Inheritance [Learners] “begin to develop their knowledge of genetics and of the role of DNA and examine moral and ethical questions which arise from technological developments.”	3	<i>Skills relate only to the 2ns sentence of the SCN</i> Adapting communication, ICT E-lit, objective reporting, setting information out, analytical skills, big picture connections, current affairs awareness, gathering facts, objective rational thinking, efficiency, reaching conclusions, discovering, weighing up different points of view.	I have extracted DNA and understand its function. I can express an informed view of the risks and benefits of DNA profiling. SCN 3-14b	DNA storage and use. DNA and crime. Morals and ethics of DNA. Human embryo research & associated issues. “Frankenstein science”	Up to and including P31
Properties and uses of substances	4	Adapting communication, ICT E-lit, note taking, objective reporting,	I have carried out research into novel	New materials., commerce, industry	Up to and including P31

		presentational skills, setting information out, sharing ideas, summarising skills, vocabulary, analytical skills, big picture connections, current affairs awareness, future orientation, gathering facts, image modelling, objective rational thinking, perceptive interpretation, processing information, reaching conclusions, discovering,, independent working, neurological connections, flexibility, problem solving	materials and can begin to explain the scientific basis of their properties and discuss the possible impacts they may have on society. SCN 4-16a		Possibly also 33-36
Earth's materials "Opportunities exist to discuss the importance of carbon compounds derived from crude oil to our lives."	4	Adapting communication, ICT E-Lit, objective reporting, setting information out, analytical skills, big picture connections, current affairs awareness, gathering facts, reaching conclusions, discovering, independent working	I have explored how different materials can be derived from crude oil and their uses. I can explain the importance of carbon compounds in our lives. SCN 4-17a	Plastics, carbon & oil based materials	
Topical science "By considering current issues of science, learners increasingly develop their understanding of scientific concepts and their capacity to form informed social, moral and ethical views. They reflect upon and critically evaluate media portrayal of scientific findings."	3	Adapting communication, ICT E-Lit, objective reporting, presentational skills, self projection, setting information out, sharing ideas, analytical skills, big picture connections, current affairs awareness, gathering facts, processing information, co-operation, participation, team skills, focus on task, reaching conclusions, discovering	I have collaborated with others to find and present information on how scientists from Scotland and beyond have contributed to innovative research and development. SCN 3-20a	Scottish scientists. World scientists. Research & Inventions	Up to and including P31-32 Possibly also 33-36

<i>In my view. This applies to all 4 topics shown here</i>					
Topical science	3	Adapting communication, objective reporting, presentational skills, setting information out, analytical skills, current affairs awareness, gathering facts, objective rational thinking, processing information, participation, efficiency, discovering, independent working, assimilation.	I can report and comment on current scientific news items to develop my knowledge and understanding of topical science. SCN 2-20b	Science in the news.	Up to and including P31-32
Topical science	4	Adapting communication, ICT E-Lit, objective reporting, setting information out, analytical skills, current affairs awareness, future orientation, gathering facts, image modelling, networking connections, objective rational thinking, synthesising skills, focus on task, reaching conclusions, discovering, independent expression, independent working	I have researched new developments in science and can explain how their current or future applications might impact on modern life. SCN 4-20a	Scientific applications & potential applications.	Up to and including P31-32 33-36
Topical science	4	Adapting communication, ICT E-Lit, objective reporting, setting information out, sharing ideas, summarising skills, analytical skills, current affairs awareness, gathering facts, image modelling, networking connections, objective rational thinking, processing information,	Having selected scientific themes of topical interest, I can critically analyse the issues, and use relevant information to develop an informed argument. SCN 4-20b	<i>No specific topic, but significant information availability & research skills implications</i>	Up to and including P31-32 Possibly also 33-36

		synthesising skills, efficiency, organising, reaching conclusions, self evaluation and correction, discovering, independent working, assimilation, weighing up different points of view			
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Notes: -

- 1) All the information in the first 2 & 4th columns above is taken from the final sciences experiences and outcomes document available on the Curriculum for Excellence website http://www.ltscotland.org.uk/Images/sciences_experiences_outcomes_tcm4-539927.doc
- 2) 3rd Level, according to the same website, is “in S1-S3”, and 4th level “broadly equates to SCQF Level 4”. I have not attempted to consider earlier levels, as only 3rd and 4th apply to secondary schools.
- 3) The page numbers refer to the information literacy framework <http://www.gcal.ac.uk/ils/documents/DraftFramework1g.pdf> (This document was consulted extensively before any page reference was determined to be the correct one.)

Comments:-

- 1) In the Literacy across learning document http://www.ltscotland.org.uk/Images/literacy_across_learning_principles_practice_tcm4-540093.doc, three “organisers” are highlighted, these being “listening and talking”, “reading” and “writing”. A search of the Sciences Experiences & outcomes document shows that none of these terms appears in it.; indeed the term “literacy” itself is missing. The word “talk” does appear, but only at the Early stage..
- 2) There have been significant changes in the Sciences document since the draft. Most notable are the extensive comments that now appear in the first column (what I call the “Topic” column although the Sciences document itself does not give any name to this column. The impact of this change is considerable, since it means that anyone using the Outcomes in many cases has to make the link themselves between these notes and the relevant SCN – in the draft version, these were made explicit – for example, readers now have to infer which Outcomes moral or ethical issues are linked to rather than these being clearly stated. Where I think these are relevant to the current analysis, I have quoted them. In some cases, it has proved very difficult to determine which specific SCNs such comments relate to.
- 3) According to the Sciences principles and practices document http://www.ltscotland.org.uk/Images/sciences_principles_practice_tcm4-540395.doc “Teachers can plan to focus on the development of specific skills through investigations, inquiries or challenges, with occasional opportunities for more detailed and comprehensive activities, recognising that any one investigation does not always require children and young people to develop the full range of skills.. A broad indication of expectations for the development of these skills at second level and at third/fourth level may be helpful.” Given the lack of a definitive list of skills in either of the sciences documents, it is difficult to see how this can be achieved
- 4) A further shift in emphasis is that much more focus has been placed on practical activities.

CURRICULUM FOR EXCELLENCE
SCIENCES EXPERIENCES AND OUTCOMES

Skills Analysis

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