Sciences Curriculum Improvement Cycle (CIC)

Development Group Workshop 2

27 February 2026

Summary report

Education Scotland
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Introduction

This summary report captures the output from the second in a series of in-person workshops for the Sciences Curriculum Improvement Cycle (CIC) Development Group. This workshop was held on 27 February in Glasgow. Detailed output and analysis from this workshop can be accessed via the event Padlet.

The Development Group event was attended by 22 participants, representing 12 local authorities alongside key national partner organisations. The Development Group is a smaller, representative subset of the Sciences CIC Collaboration Group and the wider Critical Friends network. Membership of the group was open to all Collaboration Group members, with expressions of interest invited following the group's last in-person meeting in December 2025. Careful consideration was given to achieving balanced representation across sectors and local authorities. Of the 22 participants at this workshop, representation included one practitioner from ASN, five from ELC, five from primary, eight from secondary, and three from national partner organisations.

This event formed part of a wider, ongoing programme of work, building on outcomes from the fourth Sciences CIC Core Group Workshop in January 2026.

The objectives of the workshop were to:

- Develop a structure for the sciences curriculum upon which the progression framework can be based
- Gain broad agreement on the overall content of the sciences curriculum
- Explore knowledge pathways for aspects of the sciences curriculum not currently covered in the BGE.

The work undertaken during this workshop represents an early stage of development. Emerging thinking will inform further discussion, testing, and refinement through subsequent CIC activity. Outputs from this workshop provide an initial foundation and a clear direction of travel for developing coherent approaches to knowledge progression. When they reconvene in March 2026, the Core Group will refine and consolidate the outputs from the two February CIC Development Group workshops.

Summary of activities and outputs

The two-day workshop was built around several sessions as outlined below.

Friday 27 February 2026			
Session	**Focus**	**Table groupings**	**Key outputs**
1	***Structure of the curriculum*** Using suggested knowledge cards as a stimulus, participants grouped cards into appropriate content bundles, and gave each grouping a title. Sectoral perspectives were explored initially, before a full group discussion to merge outputs.	Sector groupings Mixed sector discussions	Initial headings and sub-headings for the sciences curriculum
2	***Defining curriculum content*** Using the Experiences and Outcomes and Benchmarks for the current sciences curriculum as stimulus, participants reflected upon which content should remain, what should be removed, and what is currently missing.	Mixed sector groupings	Annotated feedback on what should be kept, removed and added to current curriculum content
3	***Future-oriented brainstorm*** Participants brainstormed ideas for knowledge not currently covered in the sciences curriculum using graffiti boards. Individual groups then used the ideas generated in the brainstorm activity to begin to consider progression pathways for these areas.	Mixed sector groupings	Graffiti board ideas for content Emerging progression pathways

Task 1 – Structure of the curriculum

The Development Group was asked to use a set of suggested knowledge cards to begin to develop an emerging structure for the sciences curriculum. These knowledge cards had been developed and refined through an iterative process involving the Collaboration Group, Core Group and Education Scotland Associates and were designed to be give an overall picture of the emerging consensus on content for the sciences curriculum. In sector groupings, participants were tasked with bundling the cards into groups of similar knowledge, being careful **not** to consider pedagogy or contexts for learning when doing so. Upon grouping the cards, they were then asked to consider an appropriate heading for each group. As group of secondary practitioners contained a large number of participants, the knowledge cards were split in three and discipline-specific knowledge was considered by subject specialists.

After allowing time for each sector to consider this task individually, groups were asked to share their output with the rest of the room, explaining their rationale and adding their headings to a wall display. Upon hearing each group's presentation, other groups were then encouraged to go back and reflect on their own output, identifying areas of similarity and considering whether their headings or card placement could be adapted to help develop an overall consensus. The headings suggested by each individual group output is shown below, while an analysis of the knowledge cards sitting beneath each heading can be viewed on the event Padlet.

Table 1: ELC and primary sector heading output

Group 1 **Primary and ELC**	**Group 2** **Primary and ELC**
Energy and movement	Energy
World around us	Taking care of our world/global issues (threats)
Our place in our universe	Me and my universe (starting with child)
Body and health	Living things
Matter/ properties/ changes	Materials
Scientist in me / science in society	Engineering (how to solve)

Table 2: secondary sector heading output

Group 3 **Secondary Biology**	**Group 4** **Secondary Chemistry**	**Group 5** **Secondary Physics**
How living things work part 1 + part 2	Periodic table and matter	Particles and waves
Evolution and diversity	Chemical reactions and acids and bases	Electromagnetism and energy
Genetics	Chemistry in action / application of chemistry	Dynamics and space
Science of health	Environmental chemistry	
Interconnections - Environmental biology		

Reviewing the output from different sectors, it was clear that primary and ELC colleagues had created much larger groupings of cards, with much synergy between their suggested titles for these. Secondary subject specialists had created what was generally agreed to be sub-headings for these larger areas, with similarities in some of their title outputs and clear links to the headings suggested by primary and ELC. As such, an emerging structure for the disciplinary knowledge for the sciences curriculum based on the merged output is outlined in the table below.

Table 3: cross-sector merged headings output

Overall heading	**Energy (and movement)**	**Materials/ Matter properties and changes**	**Living things/ Body and health**	**World around us/ Taking care of our world**
Sub-headings	Electromagnetism and energy Dynamics and space Particles and waves	Periodic table and matter Chemical reactions Acids and bases	How living things work (part 1 and 2) Science of health Evolution and diversity Genetics	Chemistry in action/application of chemistry Environmental chemistry Environmental biology

As part of the discussion on reaching this draft structure, some groups broke these headings down even further to provide a clear progression framework. Time did not allow all groups to complete this aspect of the task. Photographic records of all output for this task are available on the event Padlet. The output given will be used as a starting point for the Core Group as they continue to explore the structure of the sciences curriculum during their workshop in March 2026.

Task 2 – Defining curriculum content

Participants were introduced to the notion of a future-oriented sciences curriculum before beginning this task. Using the knowledge cards as a guide as to the broad content of the curriculum, the ES team had created stimulus materials consisting of the current sciences Experiences and Outcomes (Es and Os) and Benchmarks. These focussed specifically on those areas of the sciences curriculum that had not already been explored in detail by the Core Group or Development Group at previous workshops. These stimulus materials were divided up and participants explored them in mixed groups. In creating the groupings, ES team ensured that those Es and Os which developed across early to fourth level had representatives from ELC, primary and secondary sectors. Some of the Es and Os included in this task only featured at specific levels of CfE e.g. they did not appear at all curriculum levels. In such cases, these Es and Os were considered by practitioners from the relevant sector.

When reflecting on these stimulus materials, participants were asked to consider what should remain in the curriculum, what should be removed, and to identify any gaps. To aid discussions, they were provided with a decision-making checklist as follows.

Curriculum content should be:

1. Relevant for children and young people *(i.e. future-oriented; what a child needs by S3 for the world/life)*
2. Developmentally appropriate
3. Of interest to children and young people*
4. Not reliant on other more complex knowledge *(i.e. knowledge that might appear at senior phase only)*
5. Based on science, and not better suited to delivery by another curriculum area

*To aid discussions around checklist point 3, participants were also provided with output from a Critical Friends network who undertook work engaging with children and young peoples' views about the sciences curriculum. This can be viewed on the event Padlet.

All benchmarks were annotated by highlighting content that should remain, scoring through anything that should be removed (using the numbers above to give justification) and adding any comments to illustrate gaps that need to be addressed.

A wealth of information was gathered from this activity, all of which cannot be included in this summary report. The full raw output can be accessed via the Padlet.

Participants made a series of recommendations in terms of aspects of the current curriculum their learners find highly engaging, how to provide clarity on some aspects which are open to interpretation, and where specific content should be moved to another level based on cognitive development. In terms of removal of content and ensuring a decluttering of the curriculum, the following recommendations were made.

Table 4: suggestions for removal of E and O content (either in full or in part) including justifications		
Experience & Outcome	**Specific Benchmark(s)**	**Justification**
I have experienced, used and described a wide range of toys and common appliances. I can say what makes it go and say what they do when they work. **SCN 0-04a**	All	Not developmentally appropriate. Relies on more complex knowledge.
I am aware of different types of energy around me and can show their importance to everyday life and my survival. **SCN 1-04a**	Identifies and talks about types of energy that we get from different energy sources, for example, light, sound, heat and electrical.	Not developmentally appropriate. Relies on more complex knowledge.
I can describe an electrical circuit as a continuous loop of conducting materials. I can combine simple components in a series circuit to make a game or model. **SCN 1-09a**	All	Not always possible due to equipment limitations – could be a suggested experience but not compulsory.
I have collaborated in the design of an investigation into the effects of fertilisers on the growth of plants. I can express an informed view of the risks and benefits of their use. **SCN 2-03a**	All	Relevance. Not developmentally appropriate.
By considering examples where energy is conserved, I can identify the energy source, how it is transferred	Demonstrates understanding of the law of conservation of energy (energy can be converted from one form to another but cannot be created or destroyed).	Not developmentally appropriate. Relies on more complex knowledge.

and ways of reducing wasted energy. **SCN 2-04a**		
I can apply my knowledge of how water changes state to help me understand the processes involved in the water cycle in nature over time. **SCN 2-05a**	All	More appropriately covered in geography.
By exploring the characteristics offspring inherit when living things reproduce, I can distinguish between inherited and non-inherited characteristics. **SCN 2-14b**	Knows that genetics is the study of inherited characteristics and that inherited characteristics are carried on genes and **<u>can sometime skip a generation.</u>** Describes how every living thing has its own DNA fingerprint.	Not developmentally appropriate. Relies on more complex knowledge.
Having explored the substances that make up Earth's surface, I can compare some of their characteristics and uses. **SCN 2-17a**	All	More appropriately covered in geography.
I have investigated different water samples from the environment and explored methods that can be used to clean and conserve water and I am aware of the properties and uses of water. **SCN 2-18a**	Uses knowledge of the water cycle to explain how the quantity of water on the Earth has remained approximately the same.	More appropriately covered in geography.
I can help to design simple chemical cells and use them to investigate the factors which affect the voltage produced.	All	Not developmentally appropriate .

SCN 3-10a		
Using a microscope, I have developed my understanding of the structure and variety of cells and of their functions. **SCN 3-13a**	Identifies the structures found in plant and animal cells and describes their function Describes the main similarities and differences between plant and animal cells	Relevance. Developmental appropriateness.
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**	Describes DNA profiling as a way of using technology to analyse DNA to see a unique pattern for an individual and gives examples of practical applications (paternity tests and forensics). Presents reasoned arguments on the ethical implications of collection, processing, storage and ownership of genetic information or DNA profiles.	Relevance. Relies on more complex knowledge (move to fourth level).
Through experimentation, I can identify indicators of chemical reactions having occurred. I can describe ways of controlling the rate of reactions and can relate my findings to the world around me. **SCN 3-19a**	Explains how catalysts, including enzymes, can be used to speed up chemical reactions, and provides at least two everyday examples of reactions involving a catalyst	Not given.
I can contribute to the design of an investigation to show the effects of different factors on the rate of aerobic respiration and explain my findings. **SCN 4-02b**	Explains, using experimental findings, the effect of different factors on the rate of aerobic respiration.	Relies on more complex knowledge (understanding what it is, and not factors affecting its rate, would be enough at this level).
Through investigating the nitrogen cycle and evaluating results from practical experiments, I can suggest a design for a fertiliser, taking account of its environmental impact. **SCN 4-03a**	All	Relevance. Not developmentally appropriate. Relies on more complex knowledge.

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**	(Remove focus on formation)	Relevance.
I have developed my understanding of the kinetic model of a gas. I can describe the qualitative relationships between pressure, volume and temperature of gases. **SCN 4-05a**	Describes, from experimental observation, the relationships between pressure, volume and temperature for a fixed mass of gas.	Relies on more complex knowledge.
Through exploring the carbon cycle, I can describe the processes involved in maintaining the balance of gases in the air, considering causes and implications of changes in the balance. **SCN 4-05b**	All	Relevance.
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**	Researches and describes advances in techniques for viewing the universe, for example, using radio telescopes, emission spectra or through gravitational wave detection.	Relies on more complex knowledge.
Using experimental evidence, I can place metals in an electrochemical series and can use this information to make predictions about their use in chemical cells. **SCN 4-10a**	All	Not developmentally appropriate.

I have taken part in practical activities which involve the use of enzymes and microorganisms to develop my understanding of their properties and their use in industries. **SCN 4-13b**	Describes the properties of at least one enzyme used in industry, for example, enzymes within biological detergents and stain removers or pectinase in the breakdown of plant material to release juice.	Relevance.
I can debate the moral and ethical issues associated with some controversial biological procedures. **SCN 4-13c**	All	Relies on more complex knowledge. Ethics could be explored in more accessible contexts.
Through investigation, I can compare and contrast how different organisms grow and develop. **SCN 4-14a**	All	Relevance. Lack of progression.
Through evaluation of experimental results, I can demonstrate my understanding of conservation of mass. **SCN 4-16b**	Demonstrates understanding of conservation of mass by evaluating experimental results relating to the mass of reactants and products of at least two chemical reactions, for example, burning iron wool, making magnesium oxide or precipitation of ionic salts.	Reliant on more complex knowledge.
I have explored how different materials can be derived from crude oil and their uses. I can explain the importance of carbon compounds on our lives. **SCN 4-17a**	All	Relevance
Having carried out a range of experiments using different chemicals, I can place metals in an order of reactivity,	Draws on findings from investigations to explain how metals above iron in the reactivity series can be used to sacrificially protect iron from corrosion.	Not given.

and relate my findings to their everyday uses. **SCN 4-19b**		

The recommendations above, alongside other suggestions for additions, clarifications and movement between levels will be carefully considered by the ES team as they prepare draft progression frameworks for further feedback from Core and Collaboration Group members at future sessions.

Task 3

Using the knowledge cards from Task 1 (which indicated knowledge not currently covered in the sciences curriculum as a stimulus), participants were invited to take part in a brainstorm activity. The purpose of this activity was to share initial ideas about what knowledge might be explored by learners under the less familiar headings of ‘Global citizenship’, Climate systems’ ‘Natural hazards’, ‘Sustainability’, and ‘Waste and pollution’. In mixed sector groupings, participants rotated around each graffiti board, jotting down any ideas and ticking those left by other participants that they agreed with.

After each group had visited each graffiti board twice, groups was assigned one board each to look at in more detail. They were asked to consider all ideas shared, assign levels to when it might be most appropriate to introduce these ideas, and thus begin to develop initial progression frameworks for these areas. Time did not allow for all areas to be explored in full but emerging thinking is shown in the output below.

Table 5: suggestions for curriculum content not currently defined by Experiences and Outcomes

Early	First	Second	Third	Fourth
Global citizenship				
Links to the UNCRC. Agency – having a say over their nursery. Rights. Exposure to vocabulary like fairness and respect.	Promotion of rights. How my actions can impact others (local and close to the child that they can see) Litter. Looking after things and not taking them for granted.	How my actions can impact others (more globally – impacts you can't see). Disposability of things – water bottles, new clothes, tech.	What are the consequences of our disposability attitudes? Where do old mobile phones go?	History of where doing things has made a big difference – for example the ozone layer – everyone stopping using CFCs.
Climate systems				
Weather	Weather patterns and long-term trends (leading to understanding of climate).	Deforestation. Definitions – weather and climate. Albedo effect. Greenhouse effect. Global warming. Impact of climate - Invasive species and changing migration patterns. Heating of oceans (introduce).	Ocean acidification. Interpreting climate data. AMOC – changing ocean currents. Climate projects – where to go on holiday, impact on our community. Heating of oceans.	Adaptations – pandemics. Air pollution and impact on climate. Circular economy – reducing energy use. Evaluating data. Rise in airline turbulence. Contrails.
Natural hazards				
Seasons. Temperature. Simple data. Staying safe - suncream and clothes.	What natural and human - made disasters are. UK weather. Weather and rainfall measurement.	Extreme weather UK and global.	Understanding science of extreme weather. Adaptations – floating houses and gardens. Impact on ecosystems.	Natural. Hazards (wrong title – not just natural hazards (human-made too). Other hazards – Chernobyl.

Evaluation overview

Summary

The evaluation outcomes indicate strong confidence in both the process and the emerging curriculum structure. Responses suggest that participants feel informed, valued and well-positioned to progress into the next stage of consultation and drafting knowledge and skills statements.

Evaluation output

Of the 22 participants (practitioners and partner representatives) that attended the event across the two days, there were 19 completed evaluation forms (86% response rate). Some participants could only attend the first day and therefore have not completed the evaluation.

- **Overall how would you rate the quality of the workshops?**
  Of the 19 people who completed the evaluation, **19 (100%)** rated the event as **very good**.
- **I feel that my opinions and suggestions are being heard and included in the Sciences Curriculum Improvement Cycle**
  19 out of the 19 respondents **(100%)** stated they felt their opinions and suggestions are being heard in the CIC process – with strongly agree (84%) and agree (16%).
- **I trust the Sciences Curriculum Improvement Cycle process to deliver better outcomes for learners in Scotland?**
  19 out of the 19 respondents **(100%)** stated they trust the sciences CIC process – with strongly agree (63%) and agree (37%).
- **Do you believe that the Sciences Core group is making progress with a new sciences curriculum?**
  19 out of the 19 respondents **(100%)** stated that they believe that the Sciences Core group are making progress with a new sciences curriculum – with strongly agree (79%) and agree (21%)

Comments from respondents at the workshop:

“Feel my opinions are being taken on board and that good progress is being made.”

“It feels like we're moving forward with every interaction”

“There is a clear progression in place. Structure, knowledge experiences are becoming clearer.”

Next steps

The Core Group will reconvene on 05 and 06 March 2026 to further explore the themes discussed by this group. The Sciences CIC Collaboration Group reconvene for their fourth meeting on 26 March 2026. This will be a key date in presenting the work of the Core Group, Development Group and Critical Friends Focus Groups which have taken place since their last meeting.

Across March and April, the ES team will be working to refine and develop the draft technical framework for the sciences curriculum in line with the Scottish Government's timeline for the CIC process, which sets a timeline for sharing emerging thinking for the technical framework by summer 2026. Further meetings of the Core Group, Development Group, Collaboration Group or Critical Friends may take place during this time, subject to budgets and specific needs as the Sciences CIC technical framework is evolved.

If you have any questions about the sciences CIC process, then please contact Education Scotland's Sciences Team on email: science@educationscotland.gov.scot