Definition

Please read the following proposed definition of 'natural history'.

'Natural History focuses on understanding the rich and diverse natural world. Through observational study (generating systematic records of direct and indirect observations, often made over long periods of time) and investigation, natural history seeks to understand the diversity, complexities, and interconnectedness of life on Earth in contrasting habitats. Natural history explores how our natural world has been shaped, and how it continues to change, both by natural processes and through human intervention'

4. To what extent do you agree or disagree with the definition we have provided above?

Strongly Disagree | Disagree | Neither Agree or Disagree | Agree

5. Is there anything that you would add or remove from the definition given above?

We suggest expanding the definition to bring out the cultural and aesthetic aspects of natural history, so emphasising the multidisciplinary perspectives of natural history. This would also help to distinguish this proposed GCSE from Biology, Combined Science (and Geography) GCSEs.

We suggest revising the definition to 'interconnectedness of life on Earth in contrasting habitats and environments' to emphasise a range of habitats both today and in the past, and interconnectedness through a broader Earth systems approach.

Purpose

Please read the following statement about the purpose of studying a GCSE in Natural History:

'Natural history offers a unique opportunity to observe and engage with the natural world to develop a deeper understanding of the flora and fauna (life on Earth) within it. It is a study of how the natural world has been shaped and has evolved as well as how humans (as part of that natural world) influence, conserve and protect it. It is vital that we continue to develop our understanding of the natural world in order to safeguard the future.

To fully appreciate the complexities of the natural world it is important to study it closely and interact with it through field research and measurement. Natural history provides opportunities to develop skills out in the field as well as in a classroom and/or laboratory. Studying natural history makes an important contribution to understanding the relationship between the natural world and culture, policy decisions, scientific research and technology.

Study of science, geography, history and the arts at key stages 3 and 4 provides a variety of complementary skills and knowledge which support the study of Natural history. This subject supports the development of unique skills and knowledge which give a sharper focus and depth to the complexities of the natural world. The progression pathway for this subject at key stage 5 and beyond could be scientific, geographical, environmental, ecological or natural history itself.'

6. To what extent do you agree with the purpose described above?

Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree

7. What other purpose/s might a GCSE in Natural History serve?

Whilst we welcome OCR's initiative that 'aims to offer young people the opportunity to engage with nature, as well as give environmental issues more prominence in the curriculum', it is difficult to see how the broad purpose matches up with definition and with the proposed content areas. The content areas appear to have a strong focus on environmental management and sustainability (the expansive Theme 4 in particular) and less on 'an important contribution to understanding the relationship between the natural world and culture, policy decisions…..'.

It would be helpful to understand the starting points underpinning the purpose of this proposed GCSE from OCR's perspective, and how these thread through the proposed content and skills. We anticipate these starting points include responding to young people's concerns about the climate crisis, biodiversity loss, health and wellbeing; and we recognise the urgency in equipping young people to respond to these.

We suggest expanding the purpose to 'it is important to study it closely and interact with it through field-based research questions that involve observation, measurement and hypothesis testing'.

We suggest revising to 'This subject supports the development of pertinent skills and knowledge…..'.

We agree intrinsically that the 'study of science, geography, history and the arts at key stages 3 and 4 provides a variety of complementary skills and knowledge which support the study of Natural history' but we note the realities of curriculum and timetable pressures, likely lack of teacher confidence, experience and expertise, diversity and equality issues, and school locations would make this proposed GCSE available as an option to only a limited and privileged few. We suggest that engaging the full and diverse range of schools and their students will be the major challenge and that supporting disadvantaged schools, both primary and secondary, to provide curriculum and curriculum enrichment experiences in the lead up to GCSE option choices will be important. Targeted teacher professional development alongside partnerships with local field study providers, museums etc. to make the most of the numerous learning and engagement possibilities in local urban as well as rural settings, will be key to the success of this proposed GCSE within the wider curriculum and qualifications ecosystem.

We emphasise the importance of securing a progression route both into the proposed GCSE and leading from it. It would be interesting to consider making links with children's learning in primary education by offering a curriculum in Natural History at KS3 where the cultural aspects of poetry, art and music complement the science aspects.

It would be helpful to have further information on the post 16 progression pathway for this proposed GCSE. We can appreciate the diverse options available for students with Combined Science, Biology (and Geography) alongside Natural History but would welcome further information on existing or planned pathways for Natural History in its own right. *(note: T levels in Agriculture, Land Management and Production in 2023, and in Cultural Heritage and Visitor Attractions also in 2023)*

When considering the post 16 progression pathway, we are now suggesting that this course may well be better suited as a one year post 16 course as part of a broader curriculum offering. There are logistical advantages of working with smaller groups, and supporting individual students with their own extended investigations which should be a feature of such a course. We believe post 16 students will be a stronger position to bring together their learning synoptically from the different strands which studying natural history presents.

Scope

8. We are referring to all life on Earth where we say flora and fauna. To what extent do you agree with the following statement?

It is important that a GCSE Natural History qualification covers:

Local flora/fauna Strongly agree

National flora/fauna Agree

International flora/fauna Agree

Strongly disagree Disagree Neither agree nor disagr

9. If you have further comments on question 8 please add them below.

We suggest broadening to include a time dimension from fossil and fossil environment evidence.

In this section we'd like to understand what content you would expect to see in a Natural History GCSE to make it an interesting and purposeful qualification for students.

(Please note, the Department for Education is responsible for creating the subject content should this new GCSE be approved.)

To help explore what content you would expect, we have identified below **five possible content themes**. Alongside each theme we have added some exemplification for potential content that could be covered.

Theme 1: The natural shaping of the world

Potential content areas for this theme (non-exhaustive):

- Why are landscapes as they are?
- Pangea
- Plate tectonics (vertical as well as lateral movement, e.g. giving rise to marine fossils at high altitude)
- Island formation by volcanic activity
- Ice ages/glaciation
- Distinctive landscapes (e.g. limestone pavements, glacial valleys)
- Natural changes over time and the impact on flora and fauna.

10. To what extent do you agree this theme should be included in a GCSE Natural History qualification?

Strongly Disagree Disagree Neither Agree nor Disagree Agree

11. Is there any other content you would expect to see covered in this theme at GCSE level? Please add below.

We suggest renaming this theme, and the other themes, to reflect a key idea, so it is easier to understand where and how the content contributes to the key idea.

We suggest rephrasing the first bullet point to 'Why are modern landscapes and environments as they are?' - since natural history habitats embrace much more than landscape; they include underlying rock type, soils, slopes, aspect, variability and interconnectedness.

A study of Pangea should be included in a study of plate tectonics.

Volcanic island formation is also related to plate tectonics - as is mountain-building giving high altitude habitats.

Plate tectonics controls oceanic circulations and characteristics of continental shelves, as well as lowland and upland areas - all crucially affecting habitats.

12. Is there any content you do not think would be appropriate to cover for this theme at this level?

Theme 2: Life in the early world

Potential content areas for this theme (non-exhaustive):

- Evidence of the early world in modern landscapes
- Dinosaurs
- The rise of mammals
- Fossil records (the Jurassic coast)
- Fossil plants and piecing ecologies together
- Evolution

13. Do you agree this theme should be included in a GCSE Natural History qualification?

Strongly Disagree Disagree Neither Agree nor Disagree Agree

14. Is there any other content you would expect to see covered in this theme at GCSE level? Please add below.

We suggest renaming this theme, and the other themes, to reflect a key idea, so it is easier to understand where and how the content contributes to the key idea.

Suggested content for this theme could include:
Evidence for the early world in the geological record, preservation of fossil records, analysis of fossil records including examples from the list above, the impact of plate tectonic change and climate change on the fossil record (including the Palaeocene/Eocene thermal maximum and the ice ages).

15. Is there any content you do not think would be appropriate to cover for this theme at this level? Please add below.

Theme 3: Flora and fauna

Potential content areas for this theme (non-exhaustive)

- Inter-relationships; understanding of biodiversity
- Humans being part of the natural world and reliant upon it
- Habitats (world versus local, urban versus rural)
- Basic knowledge of terrestrial/aquatic organisms (animals, plants, fungi etc.)
- Taxonomies/classification
- Organisms of the British Isles
- Practical uses of flora/fauna - past and present (e.g. medicine, manufacturing)
- Ecology

16. Do you agree this theme should be included in a GCSE Natural History qualification?

Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree

17. Is there any other content you would expect to see covered in this theme at GCSE level? Please add below.

We suggest renaming this theme, and the other themes, to reflect a key idea, so it is easier to understand where and how the content contributes to the key idea.

We suggest adding 'environment' to 'habitats' in the third bullet point, as outlined in our response to question 5.

We suggest that organisms of the British Isles would include both past and present.

18. Is there any content you do not think would be appropriate to cover for this theme at this level? Please add below.

Theme 4: Human impact on the world

Potential content areas for this theme (non-exhaustive):

- Impact of humans on ecosystems/habitats
- Climate change (e.g. impact on flora/fauna)
- Land management practices (impact on flora and fauna)
- Effects of introducing non-native species (e.g. harlequin ladybirds, Rhododendron)
- How different communities around the world (especially indigenous peoples) have developed sustainable ways to live
- Farming methods
- Impact of diet choices for land usage and environmental impact
- Conservation methods/measures
- Methods of tracking/monitoring organisms
- Controlling invasive species
- Nature reserves/marine reserves
- Introduction of grazing to encourage biodiversity (e.g. in woodland)
- Species reintroduction (e.g. wolves, beavers, red kites)
- Impacts of losing our natural history (past and present)

19. Do you agree this theme should be included in a GCSE Natural History qualification?

Strongly Disagree Disagree Neither Agree nor Disagree Agree

20. Is there any other content you would expect to see covered in this theme at GCSE level? Please add below.

This appears to be a large and content heavy theme and with some overlap with Theme 3. It would be helpful to identify the key ideas coming through these themes and to review which content fits most appropriately where and how.

We suggest including phenology.

21. Is there any content you do not think would be appropriate to cover for this theme at this level? Please add below.

Theme 5: Our changing view of the world

Potential content areas for this theme (non-exhaustive):

- Description, interpretation and classification of the natural world over time (from cave paintings to natural history documentaries)
- Land usage conflict
- How the natural world is depicted
- Changing cultural views on the natural world over time (e.g. whale hunting versus whale watching holidays)
- Natural history and culture (influence and aspiration drawn from the environment)
- Representation in art and literature (e.g. poetry).

22. Do you agree this theme should be included in a GCSE Natural History qualification?

Strongly Disagree Disagree Neither Agree nor Disagree Agree

23. Is there any other content you would expect to see covered in this theme at GCSE level? Please add below.

This theme appears to be the least developed. We suggest the inclusion of colonisation, environmental politics, cultural (spiritual and recreational) ecosystem services, the changing role of museums and public outdoor spaces. This theme, more than the others, has the potential to make this proposed GCSE distinctive.

24. Is there any content you do not think would be appropriate to cover for this theme at this level? Please add below.

25. In this section we have shared some ideas for possible content themes. Is there a theme that you would expect to be included in GCSE Natural History that we didn't list?

☐ Yes

☐ No

26. If you answered yes, please describe what this theme should be and why you think it should be included.

Please see previous comments about the importance of identifying themes as key ideas which are explored through their content areas and enable students to develop and apply the appropriate skills for any particular theme.

In response to Question 27, we believe all the themes are important and we would not wish to rank them.

27. On a scale of 1–5, please rank the themes below in terms of importance for inclusion in a GCSE Natural History qualification.

1 = most important, 5 = least important

1 2 3

In this section we would like to explore what key skills you think would be important for a GCSE in Natural History.

28. To what extent do you agree that an element of outdoor study should be an important part of a GCSE in Natural History?

Strongly Disagree Disagree Neither Agree nor Disagree Agree

If you wish to add further comments for this question please add below.

The investigative fieldwork potential of this proposed GCSE should not be underplayed. This will be one of the distinguishing features. We stress, however, that whole organism biology and fieldwork should not be diluted in Biology and Combined Science GCSEs as a consequence in a future curriculum reform. Indeed, we expect that key aspects of this proposed GCSE, and particularly on environmental education and sustainability, are introduced and embedded into KS2 and KS3 science and geography so that all young people can benefit from these learning opportunities. This would also ensure a more natural progression into GCSE Natural History for those students considering this option if offered. We expect that this proposed GCSE would not form part of the E Bacc performance measure but would welcome clarification at these early stages of the proposals.

29. How important are <u>observation and recording skills</u> as part of a GCSE in Natural History?

Examples include:

- Use and understand classification systems
- Identify and describe diversity at different levels of scale to understand complexity and change
- Document and record evidence collected in the field, e.g. through use of illustration, photographic/film portfolios, field notebooks

- Preservation/recording/cataloguing/curation of specimens

Very Important | Important | Not sure | Not important

30. How important are <u>monitoring skills</u> as part of a GCSE in Natural History?

Examples include:

- Safe use of techniques for monitoring/detecting organisms. For example: Longworth traps, moth traps, camera traps, satellite tags, methods for monitoring reptiles, using photographs, bat detectors, bird ringing, etc.
- Use of indirect evidence (e.g. signs, tracks, landscape analysis)
- Use of Identification charts

Very important | Important | Not sure | Not important

31. How important are <u>cartographic skills and use of digital methods</u> as part of a GCSE in Natural History?

Examples include:

- Use and understand Geographical Information Systems (GIS)
- Use and understand digital data collection methods
- Interpretation and analysis of mapped data/information

Very important | Important | Not sure | Not important

32. How important are <u>data skills</u> as part of a GCSE in Natural History?

Examples include:

- Methods of tabulating and manipulating data
- Methods of representing data graphically
- Interpreting and analysing data
- Validity and reliability of results
- Understand appropriate sample sizes
- Use of approximation
- Interpretation and analysis of visual imagery (art, photographs, diagrams)
- Understanding of bias in written and visual representations of the natural world
- Critical thinking, ability to be critical about data/statistics on the natural world

Very important | Important | Not sure | Not important

33. How important are <u>research skills</u> as part of a GCSE in Natural History?

Examples include:

- Understand the selection and justification of a research topic
- Explore and understand the process of research
- Use of primary and secondary sources of information
- Presentation methods of research findings
- Recording sources used e.g. bibliography

- Ethical consideration of the approaches for capturing/recording impact on the environments being studied

Very important | Important | Not sure | Not important

34. How important are <u>qualitative skills</u> as part of a GCSE in Natural History?

- Interpretation and analysis of visual imagery (art, photographs, diagrams)
- Understanding of bias in written and visual representations of the natural world

Very important | Important | Not sure | Not important

35. Are there additional skills you consider important to develop as part of a GCSE in Natural History? Please tell us below.

Whilst all these skills are crucial to good research, understanding and experiencing the role of a natural historian, they should not be taught in isolation, but in the context of skills needed to address examples of research questions, which are in turn related to the key ideas presented through the themes. If inquiry and investigation do not underpin this proposed GCSE, it risks becoming a fragmented list of interesting topics which lack coherence between and across them.

From a skills perspective, we believe that supporting young people to develop their conceptual and epistemological knowledge and skills, transformative future-scaffolding skills, plus action competence and agency capabilities (as exemplified in the OECD's Learning Compass 2030, recent I SEE Erasmus + programme, and further developed in the current Horizon 2020 SEAS programme) will be vital in equipping young people to take on new challenges in their immediate and longer term futures. At present these skills appear to be under developed in these proposals, if not absent.

We note that the equipment under Monitoring Skills is specialist and unlikely to be covered by many school budgets. Working in partnerships with local field studies centres and museums would enable students, and teachers, to develop these skills without the financial outlay, although of course some budget to develop these partnerships will be required.