

Standards and Glossary

US Standards:

Using Genetic Information for Conservation Decisions

Next Generation Science Standards

- SEP 4 - Analyzing and Interpreting Data
- SEP 6 - Constructing Explanations and Designing Solutions
- SEP 7 - Engaging in Argument from Evidence
- DCI ESS3 - Earth and Human Activity
- DCI LS3 - Heredity: Inheritance and Variation of Traits

Common Core

- CCSS.ELA-Literacy.WHST.9-12.1 - Write arguments focused on discipline-specific content
- MP.2 - Reason abstractly and quantitatively

National Council for Social Studies

- Standard III - People, Places, and Environments
 - III.a - The study of people, places, and environments enables us to understand the relationship between human populations and the physical world.

Wildcat Identification: Phenotypes and Genotypes

Next Generation Science Standards

- SEP 4 - Analyzing and Interpreting Data
- SEP 5 - Using Mathematics and Computational Thinking
- SEP 6 - Constructing Explanations and Designing Solutions
- SEP 7 - Engaging in Argument from Evidence
- DCI ESS3 - Earth and Human Activity
- DCI LS3 - Heredity: Inheritance and Variation of Traits
- DCI LS4 - Biological Evolution: Unity and Diversity

Common Core

- CCSS.ELA-Literacy.WHST.9-12.1 - Write arguments focused on discipline-specific content
- CCSS.ELA-Literacy.RST.11-12.7 - Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- CCSS.ELA-Literacy.RST.11-12.9 - Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
- CCSS.MP.2 - Reason abstractly and quantitatively

Conservation Management: Protection and Reintroduction

Next Generation Science Standards

- SEP 4 - Analyzing and Interpreting Data
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- SEP 7 - Engaging in Argument from Evidence
- DCI ESS3 - Earth and Human Activity
- DCI LS3 - Heredity: Inheritance and Variation of Traits
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Scottish Standards:

Experiences and Outcomes (Third Level):

Sciences (Planet Earth)

- I can sample and identify living things from different habitats to compare their biodiversity and can suggest reasons for their distribution. *SCN3-01a*

Sciences (Biological systems and cells)

- I have explored the role of technology in monitoring health and improving the quality of life. *SCN3-12b*
- I can express an informed view of the risks and benefits of DNA profiling. *SCN3-14b*

Sciences (Topical science)

- I have collaborated with others to find and present information on how scientists from Scotland and beyond have contributed to innovative research and development. *SCN3-20a*
- Through research and discussion, I have contributed to evaluations of media items with regard to scientific content and ethical implications. *SCN3-20b*

Social Studies (People, place and environment)

- I can identify the possible consequences of an environmental issue and make informed suggestions about ways to manage the impact. *SOC3-08a*

Technologies (Digital Literacy)

- Having used digital technologies to search, access and retrieve information I can justify my selection in terms of validity, reliability and have an awareness of plagiarism. *TCH3-02a*

Literacy (Listening and Talking)

- When I engage with others, I can make a relevant contribution, encourage others to contribute and acknowledge that they have the right to a different opinion. I can respond in ways appropriate to my role and use contributions to reflect on, clarify or adapt thinking. *LIT3-02a*
- As I listen or watch, I can make notes and organise these to develop thinking, help retain and recall information, explore issues and create new texts, using my own words as appropriate. *LIT3-05a*
- I can independently select ideas and relevant information for different purposes, organise essential information or ideas and any supporting detail in a logical order, and use suitable vocabulary to communicate effectively with my audience. *LIT3-06a*
- I can show my understanding of what I listen to or watch by commenting, with evidence, on the content and form of short and extended texts. *LIT3-07a*

Literacy (Reading)

- I can make notes and organise them to develop my thinking, help retain and recall information, explore issues and create new texts, using my own words as appropriate. *LIT3-15a*

Literacy (Writing)

- I can use a range of strategies and resources and spell most of the words I need to use, including specialist vocabulary, and ensure that my spelling is accurate. *LIT3-21a*
- I can use notes and other types of writing to generate and develop ideas, retain and recall information, explore problems, make decisions, generate and develop ideas or create original text. *LIT3-25a*

Numeracy (Information Handling)

- I can work collaboratively, making appropriate use of technology, to source information presented in a range of ways, interpret what it conveys and discuss whether I believe the information to be robust, vague or misleading. *MNU3-20a*

Experiences and Outcomes (Fourth Level):

Sciences (Planet Earth)

- I understand how animal and plant species depend on each other and how living things are adapted for survival. I can predict the impact of population growth and natural hazards on biodiversity. *SCN4-01a*

Sciences (Biological systems and cells)

- I can debate the moral and ethical issues associated with some controversial biological procedures. *SCN4-13c*
- I can use my understanding of how characteristics are inherited to solve simple genetic problems and relate this to my understanding of DNA, genes and chromosomes. *SCN4-14c*

Sciences (Topical science)

- I have researched new developments in science and can explain how their current or future applications might impact on modern life. *SCN4-20a*
- Having selected scientific themes of topical interest, I can critically analyse the issues, and use relevant information to develop an informed argument. *SCN4-20b*

Social Studies (People, place and environment)

- I can develop my understanding of the interaction between humans and the environment by describing and assessing the impact of human activity on an area. *SOC4-10a*

Technologies (Digital Literacy)

- I can select and use digital technologies to access, select relevant information and solve real world problems. *TCH4-01a*

Literacy (Listening and Talking)

- When I engage with others, I can make a relevant contribution, ensure that everyone has an opportunity to contribute and encourage them to take account of others' points of view or alternative solutions. I can respond in ways appropriate to my role, exploring and expanding on contributions to reflect on, clarify or adapt thinking. *LIT4-02a*
- As I listen or watch, I can make notes and organise these to develop thinking, help retain and recall information, explore issues and create new texts, using my own words as appropriate. *LIT4-05a*
- I can independently select ideas and relevant information for different purposes, organise essential information or ideas and any supporting detail in a logical order, and use suitable vocabulary to communicate effectively with my audience. *LIT4-06a*
- I can show my understanding of what I listen to or watch by giving detailed, evaluative comments, with evidence, about the content and form of short and extended texts. *LIT4-07a*

Literacy (Reading)

- I can make notes and organise them to develop my thinking, help retain and recall information, explore issues and create new texts, using my own words as appropriate. *LIT4-15a*

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Literacy (Writing)

- I can use a range of strategies and resources independently and ensure that my spelling, including specialist vocabulary, is accurate. *LIT4-21a*
- I can use notes and other types of writing to generate and develop ideas, retain and recall information, explore problems, make decisions or create original text. *LIT4-25a*

Numeracy (Information Handling)

- I can evaluate and interpret raw and geographical data using. *MNU4-20a*

Key Areas:

National 3 Biology (Cell Biology)

- 2. Function of DNA
- 3. Risks and benefits of DNA profiling

National 3 Biology (Life on Earth)

- 1. Sampling and identifying living things from different habitats to compare their biodiversity and suggest reasons for their distribution

National 3 Environmental Science (Living Environment)

- 2. Factors influencing the distribution of living things

National 4 Biology (Cell Biology)

- 2. DNA, genes and chromosomes

National 4 Biology (Multicellular Organisms)

- 1. Sexual and asexual reproduction and their importance for survival of species
- 4. Genetic information

National 4 Biology (Life on Earth)

- 1. Animal and plant species depend on each other
- 2. Impact of population growth and natural hazards on biodiversity

National 4 Environmental Science (Living Environment)

- 1. Interdependence
- 2. Adaptation for survival
- 3. Impact of population growth and natural hazards on biodiversity

National 5 Biology (Cell Biology)

- 3. DNA and the production of proteins

National 5 Biology (Multicellular Organisms)

- 4. Variation and Inheritance

National 5 Biology (Life on Earth)

- 1. Ecosystems
- 2. Distribution of organisms

National 5 Environmental Science (Living Environment)

- 1. Investigating ecosystems and biodiversity
- 2. Interdependence
- 3. Human influences on biodiversity

Higher Biology (DNA and the Genome)

- 1. The Structure of DNA
- 2. Replication of DNA
- 5. The structure of the genome
- 8. Genomic sequencing

Higher Biology (Sustainability and Interdependence)

- 2. Plant and animal breeding
- 7. Components of biodiversity
- 8. Threats to biodiversity

Higher Environmental Science (Living Environment)

- 1. Investigating ecosystems and biodiversity
- 3. Human influences on biodiversity

Advanced Higher Biology (Cells and Protein)

- 1. Laboratory techniques for biologists

Advanced Higher Biology (Organisms and Evolution)

- 1. Field techniques for biologists

Advanced Higher Biology (Investigative Biology)

- 1. Scientific principles and process
- 3. Reporting and critical evaluation of biological research

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Glossary:

Allele	One of two, or more, forms of a given gene.
Argali	The argali (<i>Ovis ammon</i>), also known as the mountain sheep, is a wild sheep that roams the highlands of western East Asia, the Himalayas, Tibet, and the Altai Mountains.
Captive Breeding	The process of maintaining plants or animals in controlled environments, such as wildlife reserves, zoos, botanic gardens, and other conservation facilities. It is sometimes employed to help species that are being threatened.
Ex-Situ Conservation	The process of protecting an endangered species, variety or breed, of plant or animal outside its natural habitat; for example, by removing part of the population from a threatened habitat and placing it in a new location, which may be a wild area or within the care of humans.
Feral	A feral animal or plant is one that lives in the wild but is descended from domesticated specimens.
Genetic Diversity	The total number of genetic characteristics in the genetic makeup of a species, it ranges widely from the number of species to differences within species.
Genotype	An organism's complete set of heritable genes, or genes that can be passed down from parents to offspring.
Haplotype	A group of alleles in an organism that are inherited together from a single parent.
Hybridization	The process of an animal or plant breeding with an individual of another species or variety. For example a wildcat breeding with a domestic cat results in a hybrid cat.
In-situ Conservation	The on-site conservation or the conservation of genetic resources in natural populations of plant or animal species. This conservation is done in the population's natural habitat range.

Nucleotide	The basic building block of nucleic acids. RNA and DNA are polymers made of long chains of nucleotides. A nucleotide consists of a sugar molecule (either ribose in RNA or deoxyribose in DNA) attached to a phosphate group and a nitrogen-containing base. The bases in DNA are adenine (A), cytosine (C), guanine (G), and thymine (T). In RNA, uracil (U) takes the place of thymine.
Nucleotide Base Sequence	A succession of bases signified by a series of a set of five different letters that indicate the order of nucleotides forming alleles within a DNA or RNA molecule. In DNA the bases are A, T, C, and G. In RNA the bases are A, U, C, and G.
Pelage Score	This helps us to tell the difference between a wildcat in Scotland, a tabby domestic cat and a hybrid of the two. Each characteristic is given a score: 1 (domestic cat), 2 (hybrid) and 3 (wildcat in Scotland).
Phenotype	The term used in genetics for the observable characteristics or traits of an organism. The term covers the organism's morphology or physical form and structure, its developmental processes, its biochemical and physiological properties, its behavior, and the products of behavior.
Polymerase Chain Reaction	A method widely used to rapidly make millions to billions of copies of a specific DNA sample, allowing scientists to take a very small sample of DNA and amplify it to a large enough amount to study in detail.
Population	All the organisms of the same group or species who live in a particular geographical area and are capable of interbreeding.
Range	An area where a particular species can be found during its lifetime. Species ranges include areas where individuals or communities may migrate or hibernate.
TNVR	Stands for 'Trap, Neuter, Vaccinate, and Return,' which is a strategy used to monitor feral cat populations.