

Life Science 1 Progression

This progression is about the growth and development of individuals (at the elementary and middle school levels), leading to growth of populations at the high school level.

At elementary grades, students learn that plants and animals have unique and diverse life cycles that include being born (plant sprouting), growing, developing into adults, reproducing and eventually dying. There is a misconception of the difference in growth and development. Growth refers to things growing bigger (spiders, humans) and development refers to becoming different (egg to chicken). Students should be provided numerous learning opportunities with various plants and animals in order to understand the predictable characteristic at different stages of development of these organisms. Reproduction is essential to the continued existence of every kind of organism.

In middle school, students will construct explanations based on evidence for how the environment and genetic factors influence the growth of organisms as well as the overall size of the adult organism. Genetic factors can include large breed cattle and the species of grass affecting the growth of organisms. Local environmental conditions can include the availability of water, food, space, and light. Both factors affect the growth of adult plants. Students should recognize that there is more than one cause, and the cause and effect relationships in systems can only be described using probability.

At the high school level, **students evaluate evidence that claim the environment affects *population* growth and change (increase, decrease/extinction, or emergence of new species over time.** They learn that species become extinct because they can no longer survive and reproduce in their altered environment. If a member cannot adjust to

change that is too fast or drastic, the opportunity for the species' evolution is lost. The emphasis of this content is on determining the cause and effect relationships for how changes in the environment such as deforestation, fishing, application of fertilizers, drought, flood and the rate of change of the environment affect distribution.

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Grade 4:

Alternate K-PREP Aligned to KCAS for Science:

Use models to identify patterns of change and describe how organisms (plants and animals) have different life cycles but all have in common: birth, growth, reproduction (needed for continued existence of every kind of organism) and death.

3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. [Clarification Statement: Changes organisms go through during their life form a pattern.]

SEP (Science and Engineering Practices)	DCI (Disciplinary Core Ideas)	CC (Crosscutting Concepts)
Develop models to describe phenomena.	Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.	Patterns of change can be used to make predictions.

Grade 7:

Alternate K-PREP Aligned to KCAS for Science:

Support a scientific explanation using evidence to describe how environmental factors (availability of food, light, space, water, or drought) influence the growth of organisms (plants and animals).

07-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. [Clarification Statement: Examples of local environmental conditions could include availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting the growth of organisms. Examples of evidence could include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than in small ponds.]

SEP (Science and Engineering Practices)	DCI (Disciplinary Core Ideas)	CC (Crosscutting Concepts)
Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	Genetic factors as well as local conditions affect the growth of the adult plant. (<i>adult plants and animals</i>)	Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.

Grade 11:

Alternate K-PREP Aligned to KCAS for Science:

Evaluate evidence that supports the claim that changes to the environment (e.g., deforestation, fishing, drought and flood) affect the distribution or disappearance of traits in species which may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) extinction of other species.

HS-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals and some species, (2) the emergence of new species over time, and (3) extinction of other species. [Clarification Statement: Emphasis is on determining cause and effect relationships for how changes to the environment such as deforestation, fishing, application of fertilizers, drought, flood, and the rate of change of the environment affect the distribution or disappearance of traits in species.]

SEP (Science and Engineering Practices)	DCI (Disciplinary Core Ideas)	CC (Crosscutting Concepts)
Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments.	Species become extinct because they can no longer survive and reproduce in their altered environment. If members cannot adjust to change that is too fast or drastic, the opportunity for the species' evolution is lost.	Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

