Plants and animals meet needs in different ways.

1) Different external features of living things (LT) help them thrive in different environments
2) Needs of living things (water for plant & animal, food for animals, light for plants)
3) How animals meet needs (using other LT for food, shelter)
4) Food and teeth shape: You can tell what many animals eat from the shape of their teeth (sharp eats meat, flat eats plants)
5) How plants meet needs (roots, leaves, leaf shape)
1st Grade Activities:
- Zoo or in-class animal programs.
- Comparing pictures of plants and animals from different kinds of habitats.
- Connecting LT with specific habitats and comparing how they meet their common needs in different ways.
- Examining root water intake, dependence on sun for plants.
- Comparing tooth shapes of different animals.

2nd Grade
Reproduction and Responses – (Why do living things (LT) look the way they do?) How plants and animals inherit characteristics and respond within that set of characteristics to their environment. Compare different life cycles and means of reproduction for plants (flowers, fruits, seeds, growth) and animals (birth vs. eggs, different cycles, growth). Notice that all LT pass on their characteristics to new generations with small variations. Investigate individual response to different environmental conditions with focus on plants, altering light, gravity, water. noting that these responses Specific responses to environmental conditions like heat, light, gravity, stress, focused on plants.

<table>
<thead>
<tr>
<th>Plants and animals have predictable life cycles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) LT reproduce their own kind, offspring resembles parents</td>
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<tr>
<td>2) Different animals have different life cycles</td>
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<tr>
<td>3) LT inherit characteristics and respond to environment</td>
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<td>4) Individuals of one kind can vary within any population</td>
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<tr>
<td>5) Plants are affected by environment (germination, growth, affected by light, gravity, stress)</td>
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<tr>
<td>6) Flowers and fruits are associated with plant reproduction</td>
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</tbody>
</table>

2nd Grade Activities:
- Looking at pictures of animal parents and babies.
- Read “An EGG is Quiet”
- Planting seeds, dissecting flowers and seed pods.
- Observing insect or amphibian metamorphosis and other life cycles.
- Looking at natural variation within a species using beetle or butterfly collections.
- Experiments comparing similar plants in different environmental conditions.
- Pets
- Gardens.

3rd Grade
Adaptation and Diversity – (What causes diversity?) Once you know that different structures help different LT thrive in different environments (1st) and how LT pass on their characteristics with variations (2nd), you can learn how species adaptation and diversity occurs. The idea is that individual LTs with certain variations in characteristics in a particular environment are more likely to reproduce many times. After many generations birds that survive on insects deep in the mud will have longer beaks because any longer-beaked birds in the population will find it easier to catch food and pass on their characteristics. Second big idea is that adaptation happens over long periods of time and is closely tied to long-term conditions in
Adaptations in physical structure or behavior can improve an organism's chance for survival.

1) Structures of LT help them grow, survive, and reproduce.
2) There are diverse life forms in different environments.
3) LT change the environment they live in, some changes have bad effect on organism, some have good effects.
4) When environment changes, LT respond (may be able to survive and reproduce or may die or move to new environment).
5) LT can disappear from the Earth, some modern species resemble historic species (dinosaurs and lizards, ferns, some trees).

3rd Grade Activities:
- Review specific species adaptations that help LT survive and reproduce: comparing bird beaks between populations relying on different food sources.
- Looking at examples of changing populations linked to observable changes in environment (changing moth color associated with soot pollution).
- Look at ways that LT can change environment they live in (population booms, pollution).
- Investigate threatened and endangered species.

4th Grade
Relationships of LT – (Why is diversity important?) All LT are connected and depend on each other and the overall health of their environment for survival. Look at interconnected and competitive roles of LT for energy (producers as primary source of energy, consumers eating plants and/or animals, or recycling matter from dead organic material (decomposers: microorganisms, fungi, insects), and the special status of microorganisms providing beneficial support in all roles. Study ecosystems – a set of specific non-living characteristics like climate, soil, the LT that fill the food web roles in that ecosystem, and other dependence or competition relationships around reproduction, shelter, or energy.

All organisms need energy and matter to live and grow.

1) Plants are the primary source of matter and energy entering most food chains.
2) Producers and consumers make up food chains and food webs, competing for resources in ecosystem (herbivores, carnivores, omnivores, and decomposers).
3) Decomposers recycle matter from dead plants and animals (includes many microorganisms, fungi, insects).

Living organisms depend on one another and their environment for survival.

1) Ecosystems include both living and non-living components (organisms, soils, climate, etc).
2) In each environment some organisms thrive, some do less well, and some cannot survive at all.
3) Relationships between plants and animals (pollination, seed dispersal, animals rely on plants for food and shelter).
4) Role of microorganisms (beneficial, most are not "germs").

4th Grade Activities:
- Building/breaking food chains and webs to show interconnection.
• Observing variety of relationships for plants and animals with picture sorting.
• Transects outside to look at components of ecosystem.
• Studying terrariums or transects outdoors to record climate/soil/biota.
• Growing microorganisms (yeast, bread mold, Petri dish zoo, soil columns).
• Study compost pile- role of rot.

5th Grade
Internal Systems of LT – *(How do LT internal systems help them meet their needs?)*
Complex systems inside plants and animals help meet the organisms’ cellular needs for energy, gases, minerals, waste removal. Look inside and compare specialized structures and systems inside plants and animals that help them:

- get needed gases from the air *(lungs vs. leaf stomata)*
- get energy from *(digestion vs. photosynthesis)* to store as sugar and fat
- move needed elements and waste around *(blood circulatory system vs. plant vascular system)*
- use sugar in cells to obtain energy
- remove wastes *(kidneys/bladder vs. leaf cells and stomata releasing oxygen)*

<table>
<thead>
<tr>
<th>Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials.</th>
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<tbody>
<tr>
<td>1) Multicellular organisms have specialized structures</td>
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<tr>
<td>2) Blood circulatory system (heart, lungs), lungs and tissues exchange oxygen and carbon dioxide</td>
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<tr>
<td>3) Steps and organs of digestive system</td>
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<td>4) Role of kidneys, bladder in cellular waste removal</td>
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<td>5) Plant processes and structures moving sugar, water, minerals</td>
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<td>6) Plants use carbon dioxide and energy to make molecules of sugar and release oxygen</td>
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<tr>
<td>7) Plant and animal cells break down sugar to obtain energy, releasing carbon dioxide and water</td>
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5th Grade Activities:
- Models of organs
- Acting out organ system functions
- Experiments with gases emitted from plants and animals to show oxygen/carbon dioxide relationship
- Extracting plant pigments
- Baggie on leaf
- Dye celery to see plant vascular system
- Acting out digestion
- Dissection
- Use microscopes for cell observation