

Common alternative ideas about inter-relationships

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In recent years, science education research has stressed the importance of finding out what students already know before teaching a new topic. It is important to uncover alternative ideas that students may hold in order to provide suitable activities to challenge their current ideas and move them towards a more scientific view of the topic. Fortunately for teachers it appears that the vast majority of students hold a fairly limited range of alternative ideas about any one concept. Being aware of likely alternative ideas can help teachers plan effective science education programmes.

Common alternative ideas	Science ideas
Animals rely on people to obtain resources such as food and shelter.	Within any given ecosystem, organisms are reliant on both the living and non-living components to meet their needs for food and shelter.
Organisms can change what they eat, depending on what is available.	Each species has unique needs.
Carnivores are big and ferocious. Herbivores are passive or smaller.	Feeding relationships are complex and link the organisms within an ecosystem. There are small carnivores (e.g., some insects) and big herbivores (e.g., elephants).
Some living things do not have a role in nature especially those that don't seem to do much (e.g., starfish) or those that are unpleasant (e.g., flies).	Each species interacts with the rest of the ecosystem in unique ways. Everything has a role.
Varying the population of one organism only affects others that are directly connected through a food chain. Varying the population of some organisms has no effect because some organisms are unimportant.	Varying the population of one organism affects an entire ecosystem to some degree.
Organisms higher in the food chain eat everything below them.	Organisms higher in a food web feed on <i>some</i> organisms lower in the food web.

Matter and energy can be created or destroyed	<ul style="list-style-type: none">• Matter and energy cannot be created or destroyed• When something gets eaten or
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Matter and energy can be created or destroyed.	<ul style="list-style-type: none"> • when something gets eaten or when photosynthesis occurs there is a chemical change that results in atoms being rearranged and energy being transformed.
Food chains involve predators and prey, no producers.	<ul style="list-style-type: none"> • A food chain is a representation of a flow of energy from one organism to another. • Food chains always start with producers (plants, algae)
Plants get their food from outside (e.g., from the soil via their roots) rather than manufacturing it.	Plants (producers) use energy from the sun to make food (photosynthesis). They get water and some nutrients via their roots.
Things just rot away – no recognition of either the role of decomposers or energy and matter being transformed into something else.	Decomposers (e.g., moulds, bacteria, worms) convert dead organisms into other materials in the environment such as soil minerals that are then used by plants.

- *CASES Unit Alternative Ideas – How do things live in my neighbourhood?*
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