Code	Description	Revision History Notes (Include date, mm/dd/yy, for *each* revision history note)
Unique Item Identifier	Number assigned to item	2/27/15-Added Identifying numbers
Middle School Science Discipline Focus	For middle school, should be one of the following 4 options: Physical Science, Life Sciences, Earth and Space Sciences, Engineering Design	
NGSS Performance Expectation Code		
NGSS Disciplinary Core Ideas Code(s)	Should align with Performance Expectation Code	
NGSS Practices		
NGSS Cross-Cutting Concepts		
CCSS - Reading Standards for Literacy in Science		
CCSS - Writing Standards for Literacy in Science		
CCSS - Mathematics Content		
CCSS - Mathematics Practices		
Focus of Item	S-CK=student content knowledge, T-CK=teacher content knowledge, PCK=teacher pedogogical content knowledge	
Item Question		
Response Options 1-6		
Interpretation of Response Options 1-6	Response option shows: CORRECT or INCORRECT. If INCORRECT, and associated with a misconception, then code: SM-R=student misconception as identified by the item reference material, SM-O=student misconception as identified by some other source	
Reference for Item	APA style reference for where item was taken from	
Coded by UConn Team	Yes=NGSS & CCSS coded by UConn Team No=NGSS & CCSS coded by the item reference material	
Flag for Potentially Problematic Item	Yes=Item flagged as potentially problematic by UConn No=Item not flagged as potentially problematic by UConn	
Notes	Include any relevant notes here, including, but not limited to, reference for non-reference item codes, and a note that the item is double coded (more than one PE)	2/25/15-Added Double Coded to notes section

	Unique Item Identifier	Middle School Science Discipline Focus (i.e., Physical Science, Life Sciences, Earth and Space Sciences, Engineering Design)	NGSS Performance Expectation Code	NGSS Disciplinary Core Ideas Code(s)	NGSS Cross-Cutting Concepts	Focus of Item (S-CK, E-CK, PCK)	Item Question	Response Option 1	Interpretation of Response Option 1 (SM-R, SM-O)	Response Option 2	Interpretation of Response Option 2 (SM-R, SM-O)	Response Option 3	Interpretation of Response Option 3 (SM-R, SM-O)	Response Option 4	Interpretation of Response Option 4 (SM-R, SM-O)	Reference for Item	Coded by UConn Team (Yes, No)	Flag for Potentially Problematic Item (Yes, No)	Notes
1		Life Science	MS-LS2-3	MS-LS-2 B	Energy and Matter	S-CK	Which of the following statements is TRUE about food for animals and plants?	A. Animals and plants need food as a source of energy and as a source of material for building body parts such as muscles in animals and leaves in plants.		CORRECT		B. Animals and plants need food as a source of energy, but not as a source of material for building body parts such as muscles in animals and leaves in plants.	INCORRECT SM-R: Student misconception is that food is a source of energy, but not a source of material.	C. Animals and plants need food as a source of material for building body parts such as muscles in animals and leaves in plants, but not as a source of energy.	INCORRECT SM-R: Student misconception is that food is a source of building materials, but not a source of energy.	D. Animals and plants need food to keep them alive, but the food is not a source of energy or a source of material for building body parts such as muscles in animals and leaves in plants.	INCORRECT SM-R: Student misconception is that food is what is needed to keep animals and plants alive or grow without reference to any more specific function of food.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (29)
2		Earth Science	MS-ESS3-4	MS-ESS3.C	Stability and Change	S-CK	Which of the following is TRUE about how environmental conditions have changed since the time life began on earth?	A. Conditions have remained about the same everywhere on earth, with only minor changes from year to year.	INCORRECT SM-R: Student misconception is that except for minor fluctuations from year to year, environmental conditions have stayed the same throughout the history of the earth.	B. Conditions have remained the same in the oceans but have changed on land.	INCORRECT SM-R: Student misconception is that since the time life began, conditions have remained the same in the oceans but have changed on land.	C. Conditions have remained the same except for a few sudden changes in certain locations due to disasters, such as a meteorite striking the earth.	INCORRECT SM-R: Student misconception is that except for a few major changes due to large volcanoes that have erupted or meteorites that have struck the earth, environmental conditions have stayed the same throughout the history of the earth.	D. Conditions have changed in significant ways everywhere on earth, with some of these changes happening suddenly and others more gradually.	CORRECT			Yes	
3		Earth Science	MS-ESS3-4	MS-ESS3.C	Stability and Change	S-CK	What is TRUE about environmental conditions on earth?	A. Environmental conditions on earth have always been the same, except for minor changes from year to year.	INCORRECT SM-R: Student misconception is that except for minor fluctuations from year to year, environmental conditions have stayed the same throughout the history of the earth	B. Environmental conditions on earth changed in the past, but they are not changing now.	INCORRECT SM-R: Student misconception is that environmental conditions have changed in the past, but are no longer changing.	C. Environmental conditions on earth stayed the same in the past, but they are changing now.	INCORRECT SM-R: Student misconception is environmental conditions did not change in the past, but they are changing now	D. Environmental conditions on earth changed in the past, and they are changing now.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
4		Earth Science	MS-ESS3-4	MS-ESS3.C	Stability and Change	S-CK	Which of the following is TRUE about how changes can happen to the physical environment of earth?	A. Changes can happen suddenly or gradually.	CORRECT	B. Changes can happen suddenly but not gradually.	INCORRECT	C. Changes can happen gradually but not suddenly.	INCORRECT	D. Changes can happen neither gradually nor suddenly because the environment does not change.	INCORRECT: SM-R: Student misconception is that there have been no changes to the physical environment of the earth since life began.	AAAS Project 2061 Test Bank, n.d.	Yes		
5		Life Science	MS-LS3-3	MS-LS-2B	Cause and Effect & Patterns	S-CK	#REF!	A. The amount of grass will increase.	CORRECT	B. The amount of grass will stay the same.	INCORRECT SM-R Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web (e.g. if a predator is removed, no effect on prey. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	C. The amount of grass will decrease until it is all gone.	INCORRECT	D. The amount of grass will decrease, but some will remain.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
6		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Horses and cows are living in the same fenced pasture. The grass is the only source of food available to the horses and cows. Which of the following statements is TRUE?	A. The cows compete with other cows, the horses compete with other horses, but the cows and horses do not compete with each other for the grass.	INCORRECT SM-R. Student misconception is that different kinds of organisms (species) do not compete for resources	B. The cows do not compete with other cows, the horses do not compete with other horses, and the cows and horses do not compete with each other for the grass.	INCORRECT SM-R. Student misconception is that animals do not compete for resources	C. The cows compete with other cows, the horses compete with other horses, and the cows and horses compete with each other for the grass.	CORRECT	D. The cows do not compete with other cows, the horses do not compete with other horses, but the cows and horses compete with each other for the grass.	INCORRECT SM-R. Student misconception is that organisms of the same species do not compete with each other for resources	AAAS Project 2061 Test Bank, n.d.	Yes		
7		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Lions and cheetahs are living in the same national park in Africa. They both eat antelope that are in the park. Which of the following statements is TRUE?	A. The lions compete with other lions, the cheetahs compete with other cheetahs, but the lions and cheetahs do not compete with each other for the antelope.	INCORRECT SM-R. Student misconception is that different kinds of organisms (species) do not compete for resources	B. The lions do not compete with other lions, the cheetahs do not compete with other cheetahs, and the lions and cheetahs do not compete with each other for the antelope.	INCORRECT SM-R. Student misconception is that animals do not compete for resources	C. The lions compete with other lions, the cheetahs compete with other cheetahs, and the lions and cheetahs compete with each other for the antelope.	CORRECT	D. The lions do not compete with other lions, the cheetahs do not compete with other cheetahs, but the lions and cheetahs compete with each other for the antelope.	INCORRECT SM-R. Student misconception is that organisms of the same species do not compete with each other for resources	AAAS Project 2061 Test Bank, n.d.	Yes		
8		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Wolves and bears are living in the same national park in Canada. They both eat elk that are in the park. Which of the following statements is TRUE?	A. The wolves compete with other wolves, the bears compete with other bears, but the wolves and bears do not compete with each other for the elk.	INCORRECT SM-R. Student misconception is that different kinds of organisms (species) do not compete for resources	B. The wolves do not compete with other wolves, the bears do not compete with other bears, and the wolves and bears do not compete with each other for the elk.	INCORRECT SM-R. Student misconception is that animals do not compete for resources	C. The wolves compete with other wolves, the bears compete with other bears, and the wolves and bears compete with each other for the elk.	CORRECT	D. The wolves do not compete with other wolves, the bears do not compete with other bears, but the wolves and bears compete with each other for the elk.	INCORRECT SM-R. Student misconception is that organisms of the same species do not compete with each other for resources	AAAS Project 2061 Test Bank, n.d.	Yes		
9		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Owls, snakes, and mice live in the same area. The owls and snakes eat the mice for food. Which of the following statements is TRUE?	A. The owls compete with other owls, the snakes compete with other snakes, but the owls and snakes do not compete with each other for the mice.	INCORRECT SM-R. Student misconception is that different kinds of organisms (species) do not compete for resources	B. The owls do not compete with other owls, the snakes do not compete with other snakes, and the owls and snakes do not compete with each other for the mice.	INCORRECT SM-R. Student misconception is that animals do not compete for resources	C. The owls compete with other owls, the snakes compete with other snakes, and the owls and snakes compete with each other for the mice.	CORRECT	D. The owls do not compete with other owls, the snakes do not compete with other snakes, but the owls and snakes compete with each other for the mice.	INCORRECT SM-R. Student misconception is that organisms of the same species do not compete with each other forresources	AAAS Project 2061 Test Bank, n.d.	Yes		
10		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Sparrows and bluebirds are living in the same park. They both use the same kind of nesting sites. Which of the following statements is TRUE?	A. The sparrows compete with other sparrows, the bluebirds compete with other bluebirds, but the sparrows and bluebirds do not compete with each other for the nesting sites	INCORRECT SM-R. Student misconception is that different kinds of organisms (species) do not compete for resources	B. The sparrows do not compete with other sparrows, the bluebirds do not compete with other bluebirds, and the sparrows and bluebirds do not compete with each other for the nesting sites.	INCORRECT SM-R. Student misconception is that animals do not compete for resources	C. The sparrows compete with other sparrows, the bluebirds compete with other bluebirds, and the sparrows and bluebirds compete with each other for the nesting sites.	CORRECT	D. The sparrows do not compete with other sparrows, the bluebirds do not compete with other bluebirds, but the sparrows and bluebirds compete with each other for the nesting sites.	INCORRECT SM-R. Student misconception is that organisms of the same species do not compete with each other for resources	AAAS Project 2061 Test Bank, n.d.	Yes		
11		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	#REF!	A. The number of deer increased because without predators, the deer lived longer and had more offspring that also lived longer.	CORRECT	B. The number of deer increased because populations are always increasing.	INCORRECT SM-R. Student misconception is that populations exist in states of either constant growth or decline	C. The number of deer increased because with fewer predators, coyotes, and bobcats, the deer had more food to eat.	INCORRECT SM-R Student misconception is organisms higher in a food web eat everything that is lower in the food web	D. There is not enough information to tell why the deer population increased.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded with MCSR 118
12		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Which of the following statements about competition between animals is TRUE?	A. Animals compete for food when it is limited, but they do not compete for water when it is limited.	INCORRECT SM-R. Student misconception is that animals do not compete for water	B. Animals compete for food and water when they are limited, but they do not compete for shelter when it is limited.	INCORRECT SM-R. Student misconception is that animals do not compete for shelter	C. Animals compete for food, water, and shelter when they are limited.	CORRECT	D. Animals do not compete for any resources, even when it is limited.	INCORRECT SM-R. Student misconception is that animals do not compete for resources resources	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded with MCSR 119
13		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Which of the following statements is TRUE about competition between organisms with the same needs when resources are limited?	A. Animals are the only organisms that compete for resources.	INCORRECT SM-R. Student misconception is that plants do not compete for resources resources	B. Plants are the only organisms that compete for resources.	INCORRECT SM-R. Student misconception is that animals do not compete for resources resources	C. Neither plants nor animals compete for resources.	INCORRECT SM-R. Student misconception is that animals do not compete for resources resources. Second student misconception is that plants do not compete for resources.	D. Both plants and animals compete for resources.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Code (14)
14		Life Science	MS-LS2-1	MS-LS2-A	Cause and Effect	S-CK	Which of the following statements is TRUE about competition between organisms with the same needs when resources are limited?	A. Animals are the only organisms that compete for resources.	INCORRECT SM-R. Student misconception is that plants do not compete for resources resources	B. Plants are the only organisms that compete for resources.	INCORRECT SM-R. Student misconception is that animals do not compete for resources resources	C. Neither plants nor animals compete for resources.	INCORRECT SM-R. Student misconception is that animals do not compete for resources resources. Second student misconception is that plants do not compete for resources.	D. Both plants and animals compete for resources.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Code (13)
15		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Which of the following statements about competition between plants is TRUE?	A. Plants compete for water when it is limited, but they do not compete for space when it is limited.	INCORRECT SM-R. Student misconception is that plants do not compete for space	B. Plants compete for water and space when they are limited, but they do not compete for light when it is limited.	INCORRECT SM-R. Student misconception is that plants do not compete for light	C. Plants compete for water, space, and light when they are limited.	CORRECT	D. Plants do not compete for any resource, even when it is limited.	INCORRECT SM-R. Student misconception is that plants do not compete for resources	AAAS Project 2061 Test Bank, n.d.	Yes		
16		Life Science	MS-LS2-2	MS-LS2.A.4	Cause and Effect	S-CK	Which of the following statements about competition between animals is TRUE?	A. Competition may involve two lions fighting over prey but not two cows eating grass in the same field.	INCORRECT SM-R. Student misconception is that competition between organisms always involves direct, aggressive interaction. Exploitative competition (e.g., getting to the resource before other organisms) is not competition	B. Competition may involve two birds fighting over a nesting site but not one bird placing its eggs in the nest of another.	INCORRECT SM-R. Student misconception is that competition between organisms always involves direct, aggressive interaction. Exploitative competition (e.g., getting to the resource before other organisms) is not competition	C. Competition may involve two birds fighting over a nesting site, two lions fighting over prey, or one bird placing its eggs in the nest of another but not two cows eating grass in the same field.	INCORRECT SM-R. Student misconception is that competition between organisms always involves direct, aggressive interaction. Exploitative competition (e.g., getting to the resource before other organisms) is not competition	D. Competition may involve two birds fighting over a nesting site, two lions fighting over prey, one bird placing its eggs in the nest of another, or two cows eating grass in the same field.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
17		Life Science	MS-LS2-1	MS-LS2.A	Cause and Effect	S-CK	When would the size of a population of animals increase?	A. When the number of births is less than the number of deaths.	INCORRECT	B. When the number of births is greater than the number of deaths.	CORRECT	C. When the number of births is the same as the number of deaths.	INCORRECT	D. Populations of animals are always increasing.	INCORRECT SM-R. Student misconception is that populations exist in states of either constant growth or decline	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	This item did not fit squarely into any of the NGSS PE's we are using for this project. This was the best fit.
18		Life Science	MS-LS2-1	MS-LS2.A	Cause and Effect	S-CK	When would the size of a population of animals decrease?	A. When the number of births is less than the number of deaths.	CORRECT	B. When the number of births is greater than the number of deaths.	INCORRECT	C. When the number of births is the same as the number of deaths.	INCORRECT	D. Populations of animals are always increasing.	INCORRECT SM-R. Student misconception is that populations exist in states of either constant growth or decline	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	This item did not fit squarely into any of the NGSS PE's we are using for this project. This was the best fit.
19		Life Science	MS-LS2-1	MS-LS2.A	Cause and Effect	S-CK	Which of the following statements is TRUE about increases in the size of populations of squirrels?	A. The size of populations of squirrels can increase to be infinitely large.	INCORRECT	B. The size of populations of squirrels always increases at about the same rate.	INCORRECT	C. The size of populations of squirrels always stays about the same because the number of deaths is always about the same as the number of births.	INCORRECT	D. The size of populations of squirrels can increase when there is an increase in the food available and a decrease in the number of predators.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
20		Life Science	MS-LS2-1	MS-LS2.A	Cause and Effect	S-CK	Which of the following statements is TRUE about increases in the size of populations of robins?	A. The size of populations of robins can increase to be infinitely large.	INCORRECT	B. The size of populations of robins always increases at about the same rate.	INCORRECT	C. The size of populations of robins always stays about the same because the number of deaths is always about the same as the number of new robins hatched	INCORRECT	D. The size of populations of robins can increase when there is an increase in the food available and a decrease in the number of predators.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
21		Life Science	MS-LS2-1	MS-LS2.A	Cause and Effect & Stability and Change	S-CK	Which of the following can limit the growth of a population of organisms?	A. Both the number of predators and the availability of resources can limit the growth of a population of organisms.	CORRECT	B. The number of predators can limit the growth of a population of organisms, but the availability of resources cannot.	INCORRECT	C. The availability of resources can limit the growth of a population of organisms, but the number of predators cannot.	INCORRECT	D. Neither the number or predators nor the availability of resources can limit the growth of a population of organisms.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Code (22)
22		Life Science	MS-LS2-1	MS-LS2.A.4	Cause and Effect & Stability and Change	S-CK	Which of the following can limit the growth of a population of organisms?	A. Both the number of predators and the availability of resources can limit the growth of a population of organisms.	CORRECT	B. The number of predators can limit the growth of a population of organisms, but the availability of resources cannot.	INCORRECT	C. The availability of resources can limit the growth of a population of organisms, but the number of predators cannot.	INCORRECT	D. Neither the number or predators nor the availability of resources can limit the growth of a population of organisms.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Code (21)
23		Life Science	MS-LS2-1	MS-LS2.A.4	Cause and Effect & Stability and Change	S-CK	Which of the following can limit the growth of a population of organisms?	A. Both the number of predators and diseases can limit the growth of a population of organisms.	CORRECT	B. The number of predators can limit the growth of a population of organisms, but diseases cannot.	INCORRECT	C. Diseases can limit the growth of a population of organisms, but the number of predators cannot.	INCORRECT	D. Neither the number or predators nor diseases can limit the growth of a population of organisms.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Code (24)
24		Life Science	MS-LS1-1	MS-LS2.A & MS-LS2.C	Cause and Effect & Stability and Change	S-CK	Which of the following can limit the growth of a population of organisms?	A. Both the number of predators and diseases can limit the growth of a population of organisms.	CORRECT	B. The number of predators can limit the growth of a population of organisms, but diseases cannot.	INCORRECT	C. Diseases can limit the growth of a population of organisms, but the number of predators cannot.	INCORRECT	D. Neither the number or predators nor diseases can limit the growth of a population of organisms.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Code (23)
25		Life Science	MS-LS2-2	MS-LS2.A & MS-LS2.C	Cause and Effect & Stability and Change	S-CK	Which of the following can limit the growth of a population of organisms?	A. Both diseases and the availability of resources can limit the growth of a population of organisms.	CORRECT	B. Diseases can limit the growth of a population of organisms, but the availability of resources cannot.	INCORRECT	C. The availability of resources can limit the growth of a population of organisms, but diseases cannot.	INCORRECT	D. Neither diseases nor the availability of resources can limit the growth of a population of organisms.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Code (26)
26		Life Science	MS-LS2-1	MS-LS2.A & MS-LS2.C	Cause and Effect & Stability and Change	S-CK	Which of the following can limit the growth of a population of organisms?	A. Both diseases and the availability of resources can limit the growth of a population of organisms.	CORRECT	B. Diseases can limit the growth of a population of organisms, but the availability of resources cannot.	INCORRECT	C. The availability of resources can limit the growth of a population of organisms, but diseases cannot.	INCORRECT	D. Neither diseases nor the availability of resources can limit the growth of a population of organisms.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Code (25)
27		Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	S-CK	Which of the following is food for a plant?	A. Sugars that a plant makes	CORRECT	B. Minerals that a plant takes in from the soil	INCORRECT SM-R. Student misconception is that Minerals are food for plants.	C. Water that a plant takes in through its roots	INCORRECT SM-R. Student misconception is that Water is food for plants.	D. Carbon dioxide that a plant takes in through its leaves	INCORRECT SM-R. Student misconception is that Carbon dioxide is food for plants	AAAS Project 2061 Test Bank, n.d.	Yes		
28		Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	S-CK	Which organisms store some of the molecules from food in their bodies to use later as a source of chemical energy and building materials?	A. Both animals and plants	CORRECT	B. Animals but not plants	INCORRECT SM-R. Student misconception is that Plants cannot store molecules from food in their body structures	C. Plants but not animals	INCORRECT SM-R. Student misconception is that Animals cannot store molecules from food in their bodies	D. Neither animals nor plants	INCORRECT SM-R. Student misconception is that Plants cannot store molecules from food in their body structures and also that Animals cannot store molecules from food in their bodies	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	
29		Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	S-CK	Which of the following statements is TRUE about food for animals and plants?	A. Animals and plants need food as a source of energy and as a source of material for building body parts such as muscles in animals and leaves in plants.	CORRECT	B. Animals and plants need food as a source of energy but not as a source of material for building body parts such as muscles in animals and leaves in plants.	INCORRECT SM-R. Student misconception is that Food is a source of energy but not a source of building materials	C. Animals and plants need food as a source of material for building body parts such as muscles in animals and leaves in plants, but not as a source of energy.	INCORRECT SM-R. Student misconception is that food is a source of building materials, but not a source of energy.	D. Animals and plants need food to keep them alive, but the food is not a source of energy or a source of material for building body parts such as muscles in animals and leaves in plants.	INCORRECT SM-R. Student misconception is that food is what is needed to keep animals and plants alive or grow without reference to any more specific function of food.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (1)
30		Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	S-CK	Which of the following statements is TRUE about the carbon dioxide that is used by plants?	A. It is combined with oxygen to make sugar molecules.	INCORRECT SM-R. Student misconception is that Plants use oxygen during photosynthesis	B. It is absorbed through the roots of plants.	INCORRECT SM-R. Student misconception is that Carbon dioxide is absorbed through the roots of plants	C. It comes from the air.	CORRECT	D. It is food for plants.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
31		Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	S-CK	A student has two different liquids in open jars. She pours the liquid from one jar into the other jar, and she observes bubbles. After the bubbling stops, she finds that the total weight of the liquids is now less than the total weight of the liquids before they were mixed together. How can her observation be explained?	A. Some atoms went into the air.	CORRECT	B. Some atoms were destroyed.	INCORRECT SM-R. Student misconception is that Atoms can be destroyed during a chemical reaction	C. Some atoms became heavier	INCORRECT SM-R. Student misconception is that Atoms can become heavier during a chemical reaction	D. Some atoms became lighter	INCORRECT SM-R. Student misconception is that Atoms can become lighter during a chemical reaction	AAAS Project 2061 Test Bank, n.d.	Yes		
32		Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	S-CK	A thermometer is heated. The volume of the liquid inside of the thermometer increases, and the level of the liquid rises. What happens to the mass of the liquid in the thermometer as the level of liquid rises?	A. The mass increases.	INCORRECT SM-R. Student misconception is that When a liquid in a closed container is heated, the mass of the liquid increases as the liquid expands	B. The mass decreases.	INCORRECT	C. The mass stays the same.	CORRECT	D. It depends on the type of liquid.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		

Unique Item Identifier	Middle School Science Discipline Focus (i.e., Physical Science, Life Sciences, Earth and Space Sciences, Engineering Design)	NGSS Performance Expectation Code	NGSS Disciplinary Core Ideas Code(s)	NGSS Cross-Cutting Concepts	Focus of Item (S-CK, F-CK, PCK)	Item Question	Response Option 1	Interpretation of Response Option 1 (SM-R, SM-O)	Response Option 2	Interpretation of Response Option 2 (SM-R, SM-O)	Response Option 3	Interpretation of Response Option 3 (SM-R, SM-O)	Response Option 4	Interpretation of Response Option 4 (SM-R, SM-O)	Reference for Item	Coded by UConn Team (Yes, No)	Flag for Potentially Problematic Item (Yes, No)	Notes
33	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	Like all materials, the wood of a large oak tree is made of atoms. There were some atoms in the original acorn that the oak tree grew from. Where do you think the additional atoms came from?	A. ALL of the additional atoms were originally outside the tree		B. SOME of the additional atoms were made by the tree made as it grew.						Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-42 are subquestions of 33/34 Open-ended 1/2 is also a subquestion of 33-42 Double Coded (34i)
34	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	Like all materials, the wood of a large oak tree is made of atoms. There were some atoms in the original acorn that the oak tree grew from. Where do you think the additional atoms came from?	A. ALL of the additional atoms were originally outside the tree		B. SOME of the additional atoms were made by the tree made as it grew.						Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-42 are subquestions of 33/34 Open-ended 1/2 is also a subquestion of 33-42 Double Coded (33)
35	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	How much of the dry mass from the acorn that grew into the oak tree comes from the AIR?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-42 are subquestions of 33/34 Open-ended 1/2 is also a subquestion of 33-42 Double Coded (36)
36	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	How much of the dry mass from the acorn that grew into the oak tree comes from the AIR?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-38 are subquestions of 34 Open-ended 1/2 is also a subquestion of 34-38 Double Coded (35)
37	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	How much of the dry mass from the acorn that grew into the oak tree comes from SUNLIGHT?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-38 are subquestions of 34 Open-ended 1/2 is also a subquestion of 34-38 Double Coded (38)
38	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	How much of the dry mass from the acorn that grew into the oak tree comes from SUNLIGHT?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-42 are subquestions of 33/34 Open-ended 1/2 is also a subquestion of 33-42 Double Coded (37)
39	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	How much of the dry mass from the acorn that grew into the oak tree comes from WATER?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-42 are subquestions of 33/34 Open-ended 1/2 is also a subquestion of 33-42 Double Coded (40)
40	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	How much of the dry mass from the acorn that grew into the oak tree comes from WATER?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-42 are subquestions of 33/34 Open-ended 1/2 is also a subquestion of 33-42 Double Coded (39)
41	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	How much of the dry mass from the acorn that grew into the oak tree comes from SOIL NUTRIENTS?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-42 are subquestions of 33/34 Open-ended 1/2 is also a subquestion of 33-42 Double Coded (42)
42	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	How much of the dry mass from the acorn that grew into the oak tree comes from SOIL NUTRIENTS?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 35-42 are subquestions of 33/34 Open-ended 1/2 is also a subquestion of 33-42 Double Coded (41)
44	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	A tomato plant needs energy to live and grow. There was some energy in the original seed that the tomato plant grew from. Which of the following statements is true?	a. ALL of the tomato plant's additional energy came originally from sources outside the plant		b. SOME of the tomato plant's additional energy was made by the tomato plant as it grew.						Anderson, A. (2013). Carbon Time Assessment.	Yes		Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (43)
45	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	How much of the tomato plant's energy come from the AIR?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (46)
46	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	How much of the tomato plant's energy come from the AIR?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (45)
47	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	How much of the tomato plant's energy come from the SUNLIGHT?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (48)
48	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	How much of the tomato plant's energy come from the SUNLIGHT?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (47)
49	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	How much of the tomato plant's energy come from the WATER?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (50)
50	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	How much of the tomato plant's energy come from the WATER?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4is also a subquestion of 43-52 Double Coded (49)
51	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	How much of the tomato plant's energy come from the SOIL NUTRIENTS?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (52)
52	Earth Science	MS-ESS2-1	MS-ESS2.A	Energy and Matter	T-CK & S-CK	How much of the tomato plant's energy come from the SOIL NUTRIENTS?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (51)
53	Life Science	MS-LS2-3	MS-LS2.B	Energy and Matter	T-CK & S-CK	Here is a simple food chain with one plant, one animal, and some decomposers: Grass (is eaten by) --> Rabbit (Dies and is decomposed by) --> Decomposing bacteria The molecules in the rabbit came from the grass without changing.	TRUE		FALSE						Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key This is more specific (molecular and atom level) than the content of the LHS Curriculum Open-ended 5 is a subquestion of 53-58
54	Life Science	MS-LS2-3	MS-LS2.B	Energy and Matter	T-CK & S-CK	Here is a simple food chain with one plant, one animal, and some decomposers: Grass (is eaten by) --> Rabbit (Dies and is decomposed by) --> Decomposing bacteria The atoms in the rabbit came from the grass without changing.	TRUE		FALSE						Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key This is more specific (molecular and atom level) than the content of the LHS Curriculum Open-ended 5 is a subquestion of 53-58
55	Life Science	MS-LS2-3	MS-LS2.B	Energy and Matter	T-CK & S-CK	Here is a simple food chain with one plant, one animal, and some decomposers: Grass (is eaten by) --> Rabbit (Dies and is decomposed by) --> Decomposing bacteria The energy in the rabbit came from the grass without changing.	TRUE		FALSE						Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Open-ended 5 is a subquestion of 53-58

Unique Item Identifier	Middle School Science Discipline Focus (i.e., Physical Science, Life Sciences, Earth and Space Sciences, Engineering Design)	NGSS Performance Expectation Code	NGSS Disciplinary Core Ideas Code(s)	NGSS Cross-Cutting Concepts	Focus of Item (S-CK, I-CK, PCK)	Item Question	Response Option 1	Interpretation of Response Option 1 (SM-R, SM-O)	Response Option 2	Interpretation of Response Option 2 (SM-R, SM-O)	Response Option 3	Interpretation of Response Option 3 (SM-R, SM-O)	Response Option 4	Interpretation of Response Option 4 (SM-R, SM-O)	Reference for Item	Coded by UConn Team (Yes, No)	Flag for Potentially Problematic Item (Yes, No)	Notes
56	Life Science	MS-LS2-3	MS-LS2.B	Energy and Matter	T-CK & S-CK	Here is a simple food chain with one plant, one animal, and some decomposers: Grass (is eaten by) --> Rabbit (Dies and is decomposed by) --> Decomposing bacteria The bacteria recycle molecules from the dead rabbit back to the grass.	TRUE		FALSE						Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key This is more specific (molecular and atom level) than the content of the LHS Curriculum Opun-ended 5 in a subquestion of 53-58
57	Life Science	MS-LS2-3	MS-LS2.B	Energy and Matter	T-CK & S-CK	Here is a simple food chain with one plant, one animal, and some decomposers: Grass (is eaten by) --> Rabbit (Dies and is decomposed by) --> Decomposing bacteria The bacteria recycle atoms from the dead rabbit back to the grass.	TRUE		FALSE						Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key This is more specific (molecular and atom level) than the content of the LHS Curriculum Opun-ended 5 in a subquestion of 53-58
58	Life Science	MS-LS2-3	MS-LS2.B	Energy and Matter	T-CK & S-CK	Here is a simple food chain with one plant, one animal, and some decomposers: Grass (is eaten by) --> Rabbit (Dies and is decomposed by) --> Decomposing bacteria The bacteria recycle energy from the dead rabbit back to the grass.	TRUE		FALSE						Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Opun-ended 5 in a subquestion of 53-58
59																		
60	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. Mice	INCORRECT	B. Owls	INCORRECT	C. Trees	INCORRECT	D. Caterpillars	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
61	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of caterpillars would increase.	CORRECT	B. The number of caterpillars would decrease.	INCORRECT	C. The number of caterpillars would stay the same.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations that are not within the linear sequence in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. There is not enough information to tell what would happen to the number of caterpillars.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded MCSR 86
62	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The amount of grass and the number of mice, robins, caterpillars, and trees could increase.	INCORRECT	B. The amount of grass and the number of mice, robins, caterpillars, and trees could decrease.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	C. The number of robins could increase and the number of caterpillars could decrease.	CORRECT	D. The number of robins could decrease, and the number of caterpillars could increase.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded MCSR 87
63	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of robins would decrease.	CORRECT	B. The amount of grass would decrease.	INCORRECT	C. The number of caterpillars would decrease.	INCORRECT	D. Only the number of mice would decrease.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
64	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of insects is likely to decrease because with fewer large fish to eat the tadpoles, there would be more tadpoles eating more water plants and fewer water plants available for the insects.	CORRECT	B. The number of small fish is likely to decrease because with fewer large fish for the large birds to eat, the large birds would have to eat more small fish.	INCORRECT	C. The number of large birds is likely to stay the same because large fish and large birds are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of large fish is all that is likely to change because only large fish were taken out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
65	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of insects is likely to decrease because with fewer large fish to eat the tadpoles, there would be more tadpoles eating more water plants and fewer water plants available for the insects.	CORRECT	B. The number of insects is likely to decrease because with fewer large fish for the large birds to eat, the large birds would have to eat more insects.	INCORRECT	C. The number of insects is not likely to change because large fish are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of insects is not likely to change because people took only large fish out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
66	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of tadpoles is likely to increase because there are fewer large fish to eat the tadpoles.	CORRECT	B. The number of large birds is likely to stay the same because large fish and large birds are not connected by an arrow in the diagram.	INCORRECT	C. The number of small fish is likely to decrease because with fewer large fish fo the large birds to eat, the large birds would have to eat more small fish.	INCORRECT	D. Only the number of large fish is likely to change because only large fish were taken out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
67	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of large birds is likely to increase because there will be more small fish for the large birds to eat.	CORRECT	B. The number of large birds is likely to decrease because there will be fewer large fish for the large birds to eat.	INCORRECT	C. The number of large birds is likely to stay the same because large birds and large fish are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of large birds is not likely to change because they are higher in the diagram than the large fish, which means that the large birds will not be affected by changes below them in the diagram.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		

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68	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. Only the frog population could be affected.	INCORRECT SM-R. Student misconceptions is that changes in a population in a food web do not affect the populations of any other organism in the food web.	B. Only the populations of plants, beetles, and bears could be affected.	INCORRECT	C. Only the populations of beetles, hawks, bears, and owls could be affected.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms shown in the diagram could be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
69	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. Only the population of Ps could be affected.	INCORRECT SM-R. Student misconceptions is that changes in a population in a food web do not affect the populations of any other organism in the food web.	B. Only the population of Ls, Ns, and Ss could be affected.	INCORRECT	C. Only the population of Ps, Qs, Ss and Rs could be affected.	INCORRECT	D. The populations of all of the organisms shown in the diagram could be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
70	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. Only the populations of large fish, seals and killer whales would be affected.	INCORRECT	B. The populations of all of the organisms except the killer whales would be affected.	INCORRECT SM-R. Student misconception is that the top predator in a food web will never be significantly affected by changes in the populations of organisms below it in the food web.	C. Only the populations of shrimp, large fish, and small fish would be affected.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms would be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
71	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. Only the populations of Ls, Qs and Ss would be affected.	INCORRECT	B. The populations of all of the organisms except the Ss would be affected.	INCORRECT SM-R. Student misconception is that the top predator in a food web will never be significantly affected by changes in the populations of organisms below it in the food web.	C. Only the populations of Ms, Os, and Ns would be affected.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms would be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
72	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of Ls will increase and the number of Ns will decrease.	CORRECT	B. The number of Ls will decrease and the number of Ns will increase.	INCORRECT	C. The number of Ls will increase, and the number of Ns will stay the same.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of Ls will stay the same and the number of Ns will decrease.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
73	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The amount of grass will increase, and the number of frogs will decrease.	CORRECT	B. The amount of grass will decrease, and the number of frogs will increase.	INCORRECT	C. The amount of grass will increase and the number of frogs will stay the same.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The amount of grass will stay the same and the number of frogs will decrease.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
74	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because the number of individuals in all of the populations of organisms in this diagram will decrease when the number of Os decreases.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of Ns will decrease because there will be more Ms to eat the Ls, so fewer Ls will be available for the Ns to eat.	CORRECT	C. The number of Ns will stay the same because there will be no effect on the number of individuals in the populations of organisms below the Os in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	D. The number of Ns will stay the same because the Os and Ns are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		
75	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of mice will decrease because the number of individuals in all of the populations of organisms in this diagram will decrease.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of mice will decrease because there will be more grasshoppers to eat the grass, so there will be less grass available for the mice to eat.	CORRECT	C. The number of mice will stay the same because there will be no effect on the number of individuals in the populations of organisms below the frogs in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	D. The number of mice will stay the same because frogs and mice are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		
76	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of Ms will increase because there are fewer Ls to eat them.	INCORRECT	B. The number of Ms will decrease because there are not enough Ls for them to eat.	CORRECT	C. The number of Ms will stay the same because the Ls are killed not the Ms.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of Ms will stay the same because a change in the population of Ls will not affect any other population of organisms.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
77	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of robins will increase because there are fewer worms to eat them.	INCORRECT	B. The number of robins will decrease because there are not enough worms for them to eat.	CORRECT	C. The number of robins will stay the same because the worms are killed, not the robins.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of robins will stay the same because a change in the population of worms will not affect any other population of organisms.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organisms in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
78	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because there will be fewer Ls to eat the Ms, so there will be more Ms to eat the Ns.	INCORRECT	B. The number of Ns will decrease because there will be fewer Ls for the Ms to eat, so there will be fewer Ms available for the Ns to eat.	CORRECT	C. The number of Ns will not change because the Ls are killed, not the Ns.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	D. The number of Ns will not change because Ns are not connected to Ls in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		
79	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of foxes will decrease because there will be fewer worms to eat the robins and so more robins to eat the foxes.	INCORRECT	B. The number of foxes will decrease because there will be fewer worms for the robins to eat and so fewer robins will be available for the foxes to eat.	CORRECT	C. The number of foxes will not change because the worms are killed, not the foxes.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	D. The number of foxes will not change because it is not connected to worms in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		
80	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because there are more Ms to eat them.	INCORRECT	B. The number of Ns will decrease because there will be fewer Ms for them to eat.	CORRECT	C. The number of Ns will not change because Ns are not connected to Ls in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. More information is needed to tell what will happen to the number of Ns.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
81	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of foxes will decrease because there are more robins to eat them.	INCORRECT	B. The number of foxes will decrease because there will be fewer robins for them to eat.	CORRECT	C. The number of foxes will not change because they are not connected to worms in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. More information is needed to tell what will happen to the number of foxes.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
82	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of crickets would decrease because fewer rabbits could result in a decrease in the number of individuals in all of the populations of organisms in this diagram.	INCORRECT SM-R. The student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of crickets could decrease because with fewer rabbits for the hawks to eat, the hawks would eat crickets instead.	INCORRECT SM-R. Student misconception is that organisms higher in a food web eat everything that is lower in the food web.	C. The number of crickets could increase because with fewer rabbits for the hawks to eat, the hawks would eat more frogs, so there would be fewer frogs to eat the crickets.	CORRECT	D. The number of crickets would not be affected by the number of rabbits because crickets are not connected by an arrow to rabbits in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		

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83	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of deer increased because without predators, the deer lived longer and had more offspring that also lived longer.		CORRECT	B. The number of deer increased because populations are always increasing.	INCORRECT SM-R. Student misconception is that populations exist in states of either constant growth or decline.	C. The number of deer increased because with fewer mountain lions and wolves, the deer had more food to eat.	INCORRECT SM-R. Student misconception is that organisms higher in a food web eat everything that is lower in the food web.	D. There is not enough information in the question and diagram to tell why the deer population increased.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
84	Life Science	MS-LS2-3	MS-LS2.B	Cause and effect	S-CK	#REF!	A. The number of Ms will increase because there will be fewer Ns to eat them.		CORRECT	B. The number of Ms will decrease because there will be fewer Ns for the Ms to eat.	INCORRECT	C. The number of Ms will stay the same because changes in the number of Ns will not affect them.		D. More information is needed to determine what will happen to the number of Ms.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
85	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. Mice	INCORRECT	B. Owls	INCORRECT	C. Trees	INCORRECT	D. Caterpillars	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	yes	Double Coded (60) Could be LS2-1 also
43	Physical Science	MS-PS1-5	MS-PS1.B	Energy and Matter	T-CK & S-CK	A tomato plant needs energy to live and grow. There was some energy in the original seed that the tomato plant grew from. Which of the following statements is true?	a. ALL of the tomato plant's additional energy came originally from sources outside the plant		b. SOME of the tomato plant's additional energy was made by the tomato plant as it grew.						Anderson, A. (2013). Carbon Time Assessment.	Yes		Awaiting answer key Questions 45-52 are subquestions of 43/44 Open-ended 3/4 is also a subquestion of 43-52 Double Coded (44)
86	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of caterpillars would increase		CORRECT	B. The number of caterpillars would decrease.	INCORRECT	C. The number of caterpillars would stay the same.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations that are not within the linear sequence in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. There is not enough information to tell what would happen to the number of caterpillars.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (61) Could be LS2-1 also
87	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The amount of grass and the number of mice, robins, caterpillars, and trees could increase.	INCORRECT	B. The amount of grass and the number of mice, robins, caterpillars, and trees could decrease.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	C. The number of robins could increase and the number of caterpillars could decrease.	CORRECT	D. The number of robins could decrease, and the number of caterpillars could increase.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	yes	Double Coded (62) Could be LS2-1 also
88	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of robins would decrease.	CORRECT	B. The amount of grass would decrease.	INCORRECT	C. The number of caterpillars would decrease.	INCORRECT	D. Only the number of mice would decrease.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (63) Could be LS2-1 also
89	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of insects is likely to decrease because with fewer large fish to eat the tadpoles, there would be more tadpoles eating more water plants and fewer water plants available for the insects.	CORRECT	B. The number of small fish is likely to decrease because with fewer large fish for the large birds to eat, the large birds would have to eat more small fish.	INCORRECT	C. The number of large birds is likely to stay the same because large fish and large birds are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of large fish is all that is likely to change because only large fish were taken out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (64) Could be LS2-1 also
90	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of insects is likely to decrease because with fewer large fish to eat the tadpoles, there would be more tadpoles eating more water plants and fewer water plants available for the insects.	CORRECT	B. The number of insects is likely to decrease because with fewer large fish for the large birds to eat, the large birds would have to eat more insects.	INCORRECT	C. The number of insects is not likely to change because large fish are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of insects is not likely to change because people took only large fish out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (65) Could be LS2-1 also
91	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of tadpoles is likely to increase because there are fewer large fish to eat the tadpoles.	CORRECT	B. The number of large birds is likely to stay the same because large fish and large birds are not connected by an arrow in the diagram.	INCORRECT	C. The number of small fish is likely to decrease because with fewer large fish fo the large birds to eat, the large birds would have to eat more small fish.	INCORRECT	D. Only the number of large fish is likely to change because only large fish were taken out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (66) Could be LS2-1 also
92	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of large birds is likely to increase because there will be more small fish for the large birds to eat.	CORRECT	B. The number of large birds is likely to decrease because there will be fewer large fish for the large birds to eat	INCORRECT	C. The number of large birds is likely to stay the same because large birds and large fish are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of large birds is not likely to change because they are higher in the diagram than the large fish, which means that the large birds will not be affected by changes below them in the diagram.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (67) Could be LS2-1 also
93	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. Only the frog population could be affected.	INCORRECT SM-R. Student misconceptions is that changes in a population in a food web do not affect the populations of any other organism in the food web.	B. Only the populations of plants, beetles, and bears could be affected.	INCORRECT	C. Only the populations of beetles, hawks, bears, and owls could be affected.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms shown in the diagram could be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (68) Could be LS2-1 also

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94	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. Only the population of Ps could be affected.	INCORRECT SM-R. Student misconceptions is that changes in a population in a food web do not affect the populations of any other organism in the food web.	B. Only the population of Ls, No. and Ss could be affected.	INCORRECT	C. Only the population of Ps, Qs, Ss and Rs could be affected.	INCORRECT	D. The populations of all of the organisms shown in the diagram could be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (69) Could be LS2-1 also
95	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. Only the populations of large fish, seals and killer whales would be affected.	INCORRECT	B. The populations of all of the organisms except the killer whales would be affected.	INCORRECT SM-R. Student misconception is that the top predator in a food web will never be significantly affected by changes in the populations of organisms below it in the food web.	C. Only the populations of shrimp, large fish, and small fish would be affected.	INCORRECT SM-R. Student misconception is that vary ing the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms would be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (70) Could be LS2-1 also
96	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. Only the populations of Os, Qs and Ss would be affected.	INCORRECT	B. The populations of all of the organisms except the Ss would be affected.	INCORRECT SM-R. Student misconception is that the top predator in a food web will never be significantly affected by changes in the populations of organisms below it in the food web.	C. Only the popeultions of Ms, Os, and Ns would be affected.	INCORRECT SM-R. Student misconception is that vary ing the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms would be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (71) Could be LS2-1 also
97	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of Ls will increase and the number of Ns will decrease.	CORRECT	B. The number of Ls will decrease and the number of Ns will increase.	INCORRECT	C. The number of Ls will increase, and the number of Ns will stay the same.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of Ls will stay the same and the number of Ns will decrease.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (72) Could be LS2-1 also
98	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The amount of grass will increase, and the number of frogs will decrease.	CORRECT	B. The amount of grass will decrease, and the number of frogs will increase.	INCORRECT	C. The amount of grass will increase and the number of frogs will stay the same.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The amount of grass will stay the same and the number of frogs will decrease.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (73) Could be LS2-1 also
99	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because the number of individuals in all of the populations of organisms in this diagram will decrease when the number of Os decreases.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of Ns will decrease because there will be more Ms to eat the Ls, so fewer Ls will be available for the Ns to eat.	CORRECT	C. The number of Ns will stay the same because there will be no effect on the number of individuals in the populations of organisms below the Os in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	D. The number of Ns will stay the same because the Os and Ns are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (74) Could be LS2-1 also
100	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of mice will decrease because the number of individuals in all of the populations of organisms in this diagram will decrease.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of mice will decrease because there will be more grasshoppers to eat the grass, so there will be less grass available for the mice to eat.	CORRECT	C. The number of mice will stay the same because there will be no effect on the number of individuals in the populations of organisms below the frogs in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	D. The number of mice will stay the same because frogs and mice are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (75) Could be LS2-1 also
101	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of Ms will increase because there are fewer Ls to eat them.	INCORRECT	B. The number of Ms will decrease because there are not enough Ls for them to eat.	CORRECT	C. The number of Ms will stay the same because the Ls are killed not the Ms.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of Ms will stay the same because a change in the population of Ls will not affect any other population of organisms.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (76) Could be LS2-1 also
102	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of robins will increase because there are fewer worms to eat them.	INCORRECT	B. The number of robins will decrease because there are not enough worms for them to eat.	CORRECT	C. The number of robins will stay the same because the worms are killed, not the robins.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of robins will stay the same because a change in the population of worms will not affect any other population of organisms.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (77) Could be LS2-1 also
103	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because there will be fewer Ls to eat the Ms, so there will be more Ms to eat the Ns.	INCORRECT	B. The number of Ns will decrease because there will be fewer Ls for the Ms to eat, so there will be fewer Ms available for the Ns to eat.	CORRECT	C. The number of Ns will not change because the Ls are killed, not the Ns.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	D. The number of Ns will not change because Ns are not connected to Ls in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (78) Could be LS2-1 also
104	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of foxes will decrease because there will be fewer worms to eat the robins and so more robins to eat the foxes.	INCORRECT	B. The number of foxes will decrease because there will be fewer worms for the robins to eat and so fewer robins will be available for the foxes to eat.	CORRECT	C. The number of foxes will not change because the worms are killed, not the foxes.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	D. The number of foxes will not change because it is not connected to worms in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (79) Could be LS2-1 also
105	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because there are more Ms to eat them.	INCORRECT	B. The number of Ns will decrease because there will be fewer Ms for them to eat.	CORRECT	C. The number of Ns will not change because Ns are not connected to Ls in the diagram.	INCORRECT SM-R. Student misconception is that vary ing the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. More information is needed to tell what will happen to the number of Ns.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (80) Could be LS2-1 also
106	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of foxes will decrease because there are more robins to eat them.	INCORRECT	B. The number of foxes will decrease because there will be fewer robins for them to eat.	CORRECT	C. The number of foxes will not change because they are not connected to worms in the diagram.	INCORRECT SM-R. Student misconception is that vary ing the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. More information is needed to tell what will happen to the number of foxes.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (81) Could be LS2-1 also
107	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of crickets would decrease because fewer rabbits could result in a decrease in the number of individuals in all of the populations of organisms in this diagram.	INCORRECT SM-R. The student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of crickets could decrease because with fewer rabbits for the hawks to eat, the hawks would eat crickets instead.	INCORRECT SM-R. Student misconception is that organisms higher in a food web eat everything that is lower in the food web.	C. The number of crickets could increase because with fewer rabbits for the hawks to eat, the hawks would eat more frogs, so there would be fewer frogs to eat the crickets.	CORRECT	D. The number of crickets would not be affected by the number of rabbits because crickets are not connected by an arrow to rabbits in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (82) Could be LS2-1 also
108	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of deer increased because without predators, the deer lived longer and had more offspring that also lived longer.	CORRECT	B. The number of deer increased because populations are always increasing.	INCORRECT SM-R. Student misconception is that populations exist in states of either constant growth or decline.	C. The number of deer increased because with fewer mountain lions and wolves, the deer had more food to eat.	INCORRECT SM-R. Student misconception is that organisms higher in a food web eat everything that is lower in the food web.	D. There is not enough information in the question and diagram to tell why the deer population increased.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (83) Could be LS2-1 also
109	Life Science	MS-LS2-2	MS-LS2.A.4	Cause and effect	S-CK	#REF!	A. The number of Ms will increase because there will be fewer Ns to eat them.	CORRECT	B. The number of Ms will decrease because there will be fewer Ns for the Ms to eat.	INCORRECT	C. The number of Ms will stay the same because changes in the number of Ns will not affect them.	D. More information is needed to determine what will happen to the number of Ms.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes	Yes	Double Coded (84) Could be LS2-1 also

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110	Earth Science	MS-ESS3-4	MS-ESS3.C	Cause and effect	T-CK & S-CK	#REF!	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes		OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
111	Earth Science	MS-ESS3-4	MS-ESS3.C	Cause and effect	T-CK & S-CK	How much of the annual cycle is caused by plant growth?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes		OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
112	Earth Science	MS-ESS3-4	MS-ESS3.C	Cause and effect	T-CK & S-CK	How much of the annual cycle is caused by nuclear power plants?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes		OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
113	Earth Science	MS-ESS3-4	MS-ESS3.C	Cause and effect	T-CK & S-CK	How much of the annual cycle is caused by changes in wind and weather?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes		OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
114	Earth Science	MS-ESS3-4	MS-ESS3.C	Cause and effect	T-CK & S-CK	Why do you think carbon dioxide concentration in the atmosphere is higher than it was 47 years ago? Circle the best choice to answer each question. How much of the continual rise is caused by humans burning coal and gasoline?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes		OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
115	Earth Science	MS-ESS3-4	MS-ESS3.C	Cause and effect	T-CK & S-CK	How much of the continual rise is caused by plant growth?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes		OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
116	Earth Science	MS-ESS3-4	MS-ESS3.C	Cause and effect	T-CK & S-CK	How much of the continual rise is caused by nuclear power plants?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes		OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
117	Earth Science	MS-ESS3-4	MS-ESS3.C	Cause and effect	T-CK & S-CK	How much of the continual rise is caused by changes in wind and weather?	A. All or most		B. Some		C. None				Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes		OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
118	Life Science	MS-LS2-3	MS-LS2.B	Cause and Effect	S-CK	#REF!	A. The number of deer increased because without predators, the deer lived longer and had more offspring that also lived longer.	CORRECT	B. The number of deer increased because populations are always increasing.	INCORRECT SM-R. Student misconception is that populations exist in states of either constant growth or decline.	C. The number of deer increased because with fewer mountain lions, coyotes, and bobcats, the deer had more food to eat.	INCORRECT SM-R Student misconception is organisms higher in a food web eat everything that is lower in the food web	D. There is not enough information to tell why the deer population increased.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes		Double Coded with MCSR 11
119	Life Science	MS-LS2-1	MS-LS2.A	Cause and Effect	S-CK	Which of the following statements about competition between animals is TRUE?	A. Animals compete for food when it is limited, but they do not compete for water when it is limited.	INCORRECT SM-R. Student misconception is that animals do not compete for water	B. Animals compete for food and water when they are limited, but they do not compete for shelter when it is limited.	INCORRECT SM-R. Student misconception is that animals do not compete for shelter	C. Animals compete for food, water, and shelter when they are limited.	CORRECT	D. Animals do not compete for any resources, even when it is limited.	INCORRECT SM-R. Student misconception is that animals do not compete for resources	AAAS Project 2061 Test Bank, n.d.	Yes	Yes		Double Coded with MCSR 12
120	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of caterpillars would increase	CORRECT	B. The number of caterpillars would decrease.	INCORRECT	C. The number of caterpillars would stay the same.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations that are not within the linear sequence in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. There is not enough information to tell what would happen to the number of caterpillars.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes		Double Coded MCSR 86 and 61
121	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The amount of grass and the number of mice, robins, caterpillars, and trees could increase.	INCORRECT	B. The amount of grass and the number of mice, robins, caterpillars, and trees could decrease.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	C. The number of robins could increase and the number of caterpillars could decrease.	CORRECT	D. The number of robins could decrease, and the number of caterpillars could increase.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes	Yes		Double Coded MCSR 87 and 62
122	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of robins would decrease.	CORRECT	B. The amount of grass would decrease.	INCORRECT	C. The number of caterpillars would decrease.	INCORRECT	D. Only the number of mice would decrease.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes			
123	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of insects is likely to decrease because with fewer large fish to eat the tadpoles, there would be more tadpoles eating more water plants and fewer water plants available for the insects.	CORRECT	B. The number of small fish is likely to decrease because with fewer large fish for the large birds to eat, the large birds would have to eat more small fish.	INCORRECT	C. The number of large birds in likely to stay the same because large fish and large birds are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of large fish in all that is likely to change because only large fish were taken out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes			
124	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of insects is likely to decrease because with fewer large fish to eat the tadpoles, there would be more tadpoles eating more water plants and fewer water plants available for the insects.	CORRECT	B. The number of insects is likely to decrease because with fewer large fish for the large birds to eat, the large birds would have to eat more insects.	INCORRECT	C. The number of insects is not likely to change because large fish are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of insects is not likely to change because people took only large fish out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes			
125	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of tadpoles is likely to increase because there are fewer large fish to eat the tadpoles.	CORRECT	B. The number of large birds is likely to stay the same because large fish and large birds are not connected by an arrow in the diagram.	INCORRECT	C. The number of small fish is likely to decrease because with fewer large fish fo the large birds would have to eat more small fish.	INCORRECT	D. Only the number of large fish is likely to change because only large fish were taken out of the pond.	INCORRECT SM-R Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes			
126	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of large birds is likely to increase because there will be more small fish for the large birds to eat.	CORRECT	B. The number of large birds is likely to decrease because there will be fewer large fish for the large birds to eat	INCORRECT	C. The number of large birds in likely to stay the same because large birds and large fish are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The number of large birds is not likely to change because they are higher in the diagram than the large fish, which means that the large birds will not be affected by changes below them in the diagram.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes			

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127	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. Only the frog population could be affected.	INCORRECT SM-R. Student misconceptions is that changes in a population in a food web do not affect the populations of any other organism in the food web.	B. Only the populations of plants, beetles, and bears could be affected.	INCORRECT	C. Only the populations of beetles, hawks, bears, and owls could be affected.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms shown in the diagram could be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
128	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. Only the population of Ps could be affected.	INCORRECT SM-R. Student misconceptions is that changes in a population in a food web do not affect the populations of any other organism in the food web.	B. Only the population of Ls, Ns, and Ss could be affected.	INCORRECT	C. Only the population of Ps, Qs, Ss and Rs could be affected.	INCORRECT	D. The populations of all of the organisms shown in the diagram could be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
129	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. Only the populations of large fish, seals and killer whales would be affected.	INCORRECT	B. The populations of all of the organisms except the killer whales would be affected.	INCORRECT SM-R. Student misconception is that the top predator in a food web will never be significantly affected by changes in the populations of organisms below it in the food web.	C. Only the populations of shrimp, large fish, and small fish would be affected.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms would be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
130	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. Only the populations of Ls, Qs and Ss would be affected.	INCORRECT	B. The populations of all of the organisms except the Ss would be affected.	INCORRECT SM-R. Student misconception is that the top predator in a food web will never be significantly affected by changes in the populations of organisms below it in the food web.	C. Only the populations of Ms, Os, and Ns would be affected.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. The populations of all of the organisms would be affected.	CORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
131	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of Ls will increase and the number of Ns will decrease.	CORRECT	B. The number of Ls will decrease and the number of Ns will increase.	INCORRECT	C. The number of Ls will increase, and the number of Ns will stay the same.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of Ls will stay the same and the number of Ns will decrease.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
132	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The amount of grass will increase, and the number of frogs will decrease.	CORRECT	B. The amount of grass will decrease, and the number of frogs will increase.	INCORRECT	C. The amount of grass will increase and the number of frogs will stay the same.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The amount of grass will stay the same and the number of frogs will decrease.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
133	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because the number of individuals in all of the populations of organisms in this diagram will decrease when the number of Os decreases.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of Ns will decrease because there will be more Ms to eat the Ls, so fewer Ls will be available for the Ns to eat.	CORRECT	C. The number of Ns will stay the same because there will be no effect on the number of individuals in the populations of organisms below the Os in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	D. The number of Ns will stay the same because the Os and Ns are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		
134	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of mice will decrease because the number of individuals in all of the populations of organisms in this diagram will decrease.	INCORRECT SM-R. Student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of mice will decrease because there will be more grasshoppers to eat the grass, so there will be less grass available for the mice to eat.	CORRECT	C. The number of mice will stay the same because there will be no effect on the number of individuals in the populations of organisms below the frogs in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	D. The number of mice will stay the same because frogs and mice are not connected by an arrow in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		
135	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of Ms will increase because there are fewer Ls to eat them.	INCORRECT	B. The number of Ms will decrease because there are not enough Ls for them to eat.	CORRECT	C. The number of Ms will stay the same because the Ls are killed not the Ms.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of Ms will stay the same because a change in the population of Ls will not affect any other population of organisms.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
136	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of robins will increase because there are fewer worms to eat them.	INCORRECT	B. The number of robins will decrease because there are not enough worms for them to eat.	CORRECT	C. The number of robins will stay the same because the worms are killed, not the robins.	INCORRECT SM-R. Student misconception is that a change in the size of a prey population has no effect on its predator population.	D. The number of robins will stay the same because a change in the population of worms will not affect any other population of organisms.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		
137	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because there will be fewer Ls to eat the Ms, so there will be more Ms to eat the Ns.	INCORRECT	B. The number of Ns will decrease because there will be fewer Ls for the Ms to eat, so there will be fewer Ms available for the Ns to eat.	CORRECT	C. The number of Ns will not change because the Ls are killed, not the Ns.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	D. The number of Ns will not change because Ns are not connected to Ls in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		
138	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of foxes will decrease because there will be fewer worms to eat the robins and so more robins to eat the foxes.	INCORRECT	B. The number of foxes will decrease because there will be fewer worms for the robins to eat and so fewer robins will be available for the foxes to eat.	CORRECT	C. The number of foxes will not change because the worms are killed, not the foxes.	INCORRECT SM-R. Student misconception is that changes in a population in a food web do not affect the populations of any other organism in the food web.	D. The number of foxes will not change because it is not connected to worms in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		
139	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of Ns will decrease because there are more Ms to eat them.	INCORRECT	B. The number of Ns will decrease because there will be fewer Ms for them to eat.	CORRECT	C. The number of Ns will not change because Ns are not connected to Ls in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. More information is needed to tell what will happen to the number of Ns.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
140	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of foxes will decrease because there are more robins to eat them.	INCORRECT	B. The number of foxes will decrease because there will be fewer robins for them to eat.	CORRECT	C. The number of foxes will not change because they are not connected to worms in the diagram.	INCORRECT SM-R. Student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	D. More information is needed to tell what will happen to the number of foxes.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
141	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of crickets would decrease because fewer rabbits could result in a decrease in the number of individuals in all of the populations of organisms in this diagram.	INCORRECT SM-R. The student misconception is that if the size of one population in a food web is altered, all other populations in the web will be altered in the same way.	B. The number of crickets could decrease because with fewer rabbits for the hawks to eat, the hawks would eat crickets instead.	INCORRECT SM-R. Student misconception is that organisms higher in a food web eat everything that is lower in the food web.	C. The number of crickets could increase because with fewer rabbits for the hawks to eat, the hawks would eat more frogs, so there would be fewer frogs to eat the crickets.	CORRECT	D. The number of crickets would not be affected by the number of rabbits because crickets are not connected by an arrow to rabbits in the diagram.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. Another student misconception is that varying the size of a population of organisms will affect only those populations of organisms that are directly connected to it in a feeding relationship, not organisms that are one or more steps removed/away from it.	AAAS Project 2061 Test Bank, n.d.	Yes		

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142	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of deer increased because without predators, the deer lived longer and had more offspring that also lived longer.	CORRECT	B. The number of deer increased because populations are always increasing.	INCORRECT SM-R. Student misconception is that populations exist in states of either constant growth or decline.	C. The number of deer increased because with fewer mountain lions and wolves, the deer had more food to eat.	INCORRECT SM-R. Student misconception is that organisms higher in a food web eat everything that is lower in the food web.	D. There is not enough information in the question and diagram to tell why the deer population increased.	INCORRECT	AAAS Project 2061 Test Bank, n.d.	Yes		
143	Life Science	MS-LS2-1	MS-LS2.A	Cause and effect	S-CK	#REF!	A. The number of Ms will increase because there will be fewer Ns to eat them.	CORRECT	B. The number of Ms will decrease because there will be fewer Ns for the Ms to eat.	INCORRECT	C. The number of Ms will stay the same because changes in the number of Ns will not affect them.		D. More information is needed to determine what will happen to the number of Ms.	INCORRECT SM-R. Student misconception is that if a population in a food web is disturbed, there will be little or no effect on populations below it in the food web.	AAAS Project 2061 Test Bank, n.d.	Yes		

Middle School Science Discipline Focus (i.e., Physical Science, Life Sciences, Earth and Space Sciences, Engineering Design)	NGSS Performance Expectation Code	NGSS Disciplinary Core Ideas Code(s)	NGSS Practices	NGSS Cross-Cutting Concepts	CCSS - Reading Standards for Literacy in Science	CCSS - Writing Standards for Literacy in Science	CCSS - Mathematics Content	CCSS - Mathematics Practices	Focus of Item (S-C K, T-CK, PCK)	Item Question	Response Option 1	Interpretation of Response Option 1 (SM-R, SM-O)	Response Option 2	Interpretation of Response Option 2 (SM-R, SM-O)	Response Option 3	Interpretation of Response Option 3 (SM-R, SM-O)	Response Option 4	Interpretation of Response Option 4 (SM-R, SM-O)	Response Option 5	Interpretation of Response Option 5 (SM-R, SM-O)	Response Option 6	Interpretation of Response Option 6 (SM-R, SM-O)	Reference for Item	Coded by UConn Team (Yes, No)	Flag for Potentially Problematic Item (Yes, No)	Notes

Unique Item Identifier	Middle School Science Discipline Focus (i.e., Physical Science, Life Sciences, Earth and Space Sciences, Engineering Design)	NGSS Performance Expectation Code	NGSS Disciplinary Core Ideas Code(s)	NGSS Practices	NGSS Cross-Cutting Concepts	CCSS - Reading Standards for Literacy in Science	CCSS - Writing Standards for Literacy in Science	CCSS - Mathematics Content	CCSS - Mathematics Practices	Focus of Item (S-CK, T-CK, PCK)	Item Question	Response Option 1	Interpretation of Response Option 1 (SM-R, SM-O)	Response Option 2	Interpretation of Response Option 2 (SM-R, SM-O)	Response Option 3	Interpretation of Response Option 3 (SM-R, SM-O)	Response Option 4	Interpretation of Response Option 4 (SM-R, SM-O)	Response Option 5	Interpretation of Response Option 5 (SM-R, SM-O)	Response Option 6	Interpretation of Response Option 6 (SM-R, SM-O)	Reference for Item	Coded by UConn Team (Yes, No)	Flag for Potentially Problematic Item (Yes, No)	Notes
1	Physical Science	MS-PS1-5	MS-PS1.B		Energy and Matter					S-CK & T-CK	How does the oak tree gain mass as it grows?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Subquestion for MCSR 33-42 Double Coded OR-2
2	Earth Science	MS-ESS2-1	MS-ESS2.A		Energy and Matter					T-CK & S-CK	How does the oak tree gain mass as it grows?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Subquestion for MCSR 33-42 Double Coded OR-1
3	Physical Science	MS-PS1-5	MS-PS1.B		Energy and Matter					S-CK & T-CK	How does the tomato plant get its energy?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Subquestion for MCSR 43-52 Double Coded OR-4
4	Earth Science	MS-ESS2-1	MS-ESS2.A		Energy and Matter					T-CK & S-CK	How does the tomato plant get its energy?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Subquestion for MCSR 43-52 Double Coded OR-3
5	Life Science	MS-LS2-3	MS-LS2.B		Energy and Matter					T-CK & S-CK	How do molecules, atoms and energy move through the food chain?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key Subquestion for MCSR 53-58 This is more specific (molecular and atom level) than the content of the LHS Curriculum
6	Life Science	MS-LS2-3	MS-LS2.B		Energy and Matter					T-CK & T-PCK	How do you think the explanations of growth of an oak tree that your students will give at the beginning of class this fall will compare to the students whose reposnes you saw in a previous section? For example, which group of reposnes would you expect to be most common in your class at the beginning of the school year? Why?													Anderson, A. (2013). Carbon Time Assessment.	Yes		
7	Physical Science	MS-PS1-5	MS-PS1.B		Energy and Matter					T-CK & T-PCK	A student was studying how mice grow. He collected these data: Mass of mouse at the beginning of the experiment: 50 g Mass of mouse one week later: 60 g Mass of water that the mouse drank: 30 g Mass of food that the mouse ate: 30 g The student said, "The food and the water weighed the same amount, so growing mice get half of their weight from food and half from water." Do you think the student is correct? Explain your reasoning.													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key OR 8 is a subquestion of OR 7 This is more specific (molecular and atom level) than the content of the LHS Curriculum
8	Physical Science	MS-PS1-5	MS-PS1.B		Energy and Matter					T-CK & T-PCK	What questions about the mouse growing remain unanswered after collecting this set of evidence? Explain your reasoning.													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key OR 8 is a subquestion of OR 7 This is more specific (molecular and atom level) than the content of the LHS Curriculum
9	Life Science	MS-LS2-3	MS-LS2.B		Energy and Matter					T-CK & T-PCK	What classroom activities would you use to improve students' explanations of tree growth?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key OR 9 and OR 10 are subquestions of OR 6
10	Life Science	MS-LS2-3	MS-LS2.B		Energy and Matter					T-CK & T-PCK	Briefly describe an investigation that could help students improve their explanations of how trees and other plants grow. What would students observe or measure? What results or patterns of evidence would you like them to see? What conclusions would you like them to draw?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key OR 9 and OR 10 are subquestions of OR 6
11	Earth Science	MS-ESS3-4	MS-ESS3.C		Cause & Effect					T-CK & S-CK	Explain your choices. Why does atmospheric carbon dioxide concentration go down every summer and go up every winter?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
11B	Earth Science	MS-ESS3-4	MS-ESS3.C		Cause & Effect					T-CK & S-CK	Explain your choices. How do the processes that you chose cause more carbon dioxide to go into the atmosphere each year?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	Awaiting answer key OR 11 and 12 are subquestions of MCSR 110, 111, 112, 113, 114, 115, 116, 117
12	Life Science	MS-ESS2-1	MS-ESS2.A		Energy and Matter					T-CK & T-PCK	#REF!													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	OR 13, 14, 15, 16 are subquestions of OR 12
13	Life Science	MS-ESS2-1	MS-ESS2.A		Energy and Matter					T-CK & T-PCK	What characteristics in reasoning and language do Group 2 student responses have in common? Is Group 2 the highest, middle, or lowest group? Please explain your ranking for Group 2.													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	OR 13, 14, 15, 16 are subquestions of OR 12
14	Life Science	MS-ESS2-1	MS-ESS2.A		Energy and Matter					T-CK & T-PCK	What characteristics in reasoning and language do Group 3 student responses have in common? Is Group 3 the highest, middle, or lowest group? Please explain your ranking for Group 3.													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	OR 13, 14, 15, 16 are subquestions of OR 12
15	Life Science	MS-ESS2-1	MS-ESS2.A		Energy and Matter					T-CK & T-PCK	If you disagree with the teacher's grouping, please explain how you would change the grouping and why.													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	OR 13, 14, 15, 16 are subquestions of OR 12
16	Life Science	MS-ESS2-1	MS-ESS2.A		Energy and Matter					T-CK & T-PCK	Which group of responses would you expect to be most common in your class at the end of the school year? Why?													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	OR 13, 14, 15, 16 are subquestions of OR 12
17	Physical Science	MS-PS1-5	MS-PS1.B		Energy and Matter					T-CK & T-PCK	#REF!													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	THIS IS JUST A GRAPHIC TO BE ABLE TO ANSWER OR 18 AND 19 NOT AN ACTUAL QUESTION

18	Physical Science	MS-PS1-5	MS-PS1.B		Energy and Matter					T-CK & T-PCK	#REF!													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	OR 18 and 19 are subquestions of OR 17
19	Physical Science	MS-PS1-5	MS-PS1.B		Energy and Matter					T-CK & T-PCK	#REF!													Anderson, A. (2013). Carbon Time Assessment.	Yes	Yes	OR 18 and 19 are subquestions of OR 17

APA Style Reference for Source	Source Notes
AAAS Project 2061 Test Bank, n.d.	This source also contains: -References for each individual misconception -Percentages of students who chose the misconception or correct answer for Grades 6-8, Grades 9-12, Males, Females, English as a primary language, English not as a primary language, and the overall percentage.