Kentucky Summative Assessments

Grade 11 Science
Released Items
2024

As they were driving home from soccer practice one evening, Taylor and her mother had to swerve to avoid a deer that ran across the road in front of them.

"Gosh, there sure are a lot of deer in our neighborhood," Taylor said.

"Yes, there sure are," her mother replied. "There weren't nearly as many deer around here when I was a kid. If the population keeps growing, we may be in deer up to our eyeballs soon."

Taylor became interested in how the deer population had increased in her neighborhood and what effect it might have on the ecosystem. She found this information on statewide deer population growth over time.

Figure 1:
Kentucky Deer Population

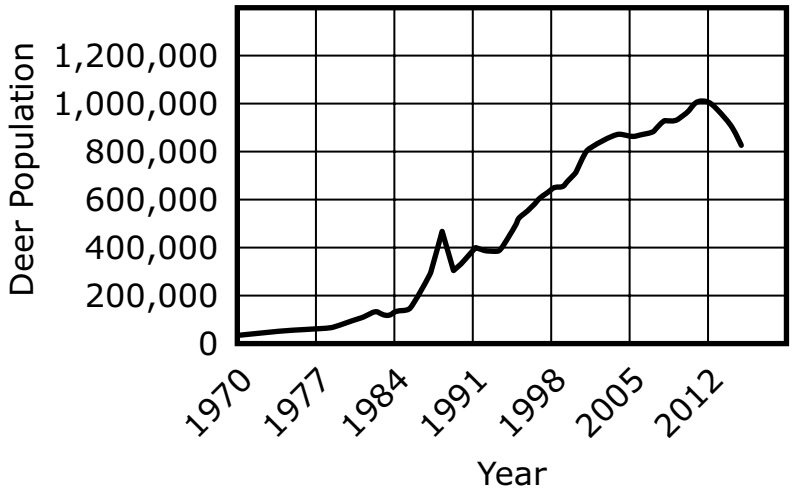


Figure 2:
Ohio Deer Population

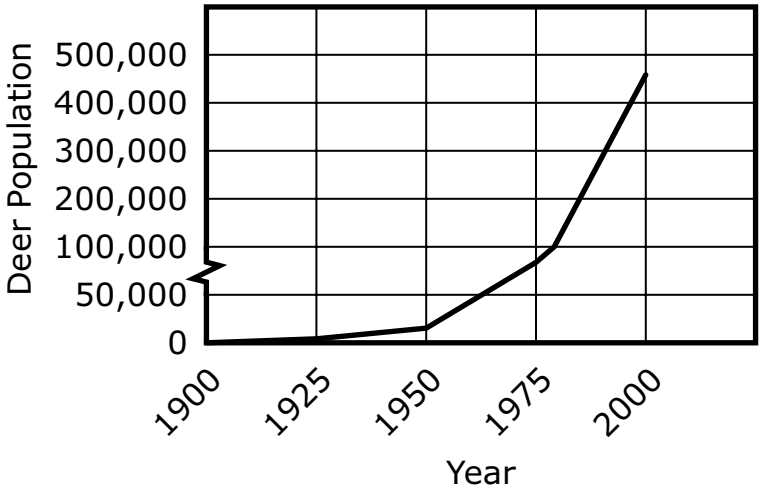
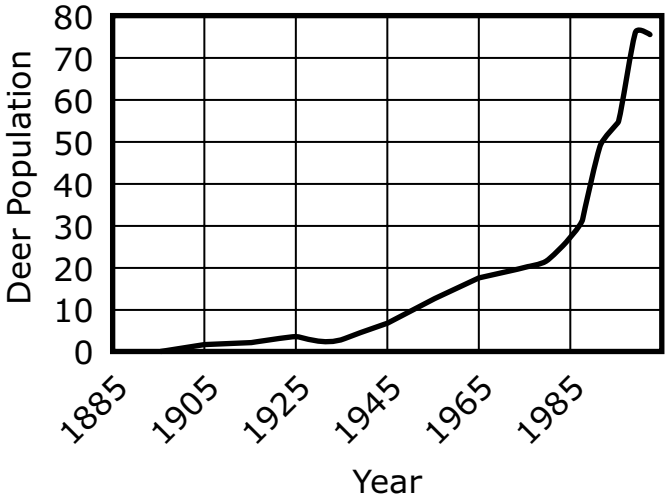


Figure 3:
Connecticut Deer Population



She learned that deer were plentiful in the 1800s but had become almost nonexistent in Kentucky by the 1930s and that the current statewide population is approaching 1,000,000. The dramatic decrease and later increase in deer populations are both attributed to a number of human-caused factors.

Efforts by the state Fish and Wildlife Department to protect and support the growth of Kentucky's deer population resulted in the growth trend shown in Figure 1. Deer populations in other states have also grown dramatically, as shown in Figures 2 and 3.

Data shown for the Ohio and Connecticut deer populations ends at 2000 and 2005 respectively, while the Kentucky data continues into 2015. Taylor wondered whether the Ohio and Connecticut deer population data would eventually reveal the same trend seen in Kentucky after 2005.

1

BI1712_01_2

For the Ohio and Connecticut deer populations to demonstrate the same trend as seen in Kentucky after 2005, which one of these would have to be **true**?

A Resource availability must continue to expand faster than the deer population grows in Ohio and Connecticut.

B Carrying capacity must be exceeded in Ohio and Connecticut.

C The population of predatory species present within the Ohio and Connecticut ecosystems must be stable.

D The Ohio and Connecticut ecosystems must remain free of widespread diseases impacting deer.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 11
Science

Item: BI1712_01
Book Question Number: 1

Standard: HS-LS2-1

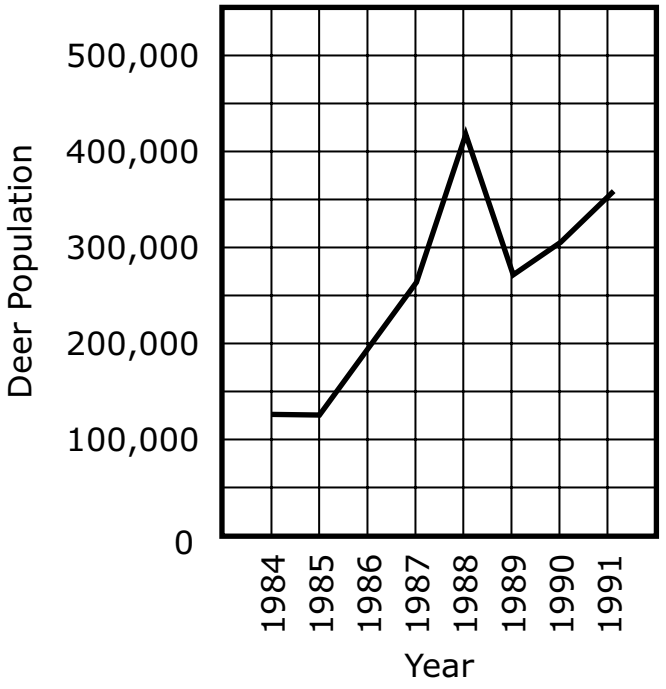
Item Type: MC
Key: B

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**21,812**	18%	0.18	34%	18%	33%	15%
Gender							
Female	**10,872**	16%	0.16	34%	16%	35%	16%
Male	**10,938**	20%	0.20	34%	20%	31%	15%
Ethnicity							
African American	**2,320**	17%	0.17	34%	17%	36%	13%
American Indian or Alaska Native	**32**	6%	0.06	34%	6%	41%	19%
Asian	**411**	23%	0.23	34%	23%	28%	15%
Hispanic or Latino	**1,892**	17%	0.17	34%	17%	35%	14%
Native Hawaiian or Pacific Islander	**31**	16%	0.16	16%	16%	39%	29%
White (non-Hispanic)	**16,186**	18%	0.18	34%	18%	32%	16%
Two or more races	**938**	16%	0.16	36%	16%	36%	13%
Migrant	**67**	16%	0.16	39%	16%	36%	9%
English Learner	**767**	16%	0.16	32%	16%	39%	14%
Economically Disadvantaged	**11,662**	17%	0.17	34%	17%	35%	14%
Students with Disabilities	**1,115**	16%	0.16	38%	16%	33%	12%

Figure 4:
Ohio Deer Population

Year	Deer Population
1984	131,544
1985	134,350
1986	206,557
1987	292,944
1988	465,000
1989	301,166
1990	342,307
1991	401,984

Figure 5: Kentucky Deer Population



The data table in Figure 4 and the graph in Figure 5 show the deer population change in Ohio and Kentucky between 1984 and 1991.

2

BI1712_02_1

Which one possible influence might **best** explain the population change between 1988 and 1989?

A Increase in the length of the deer hunting season

B Reduction of the predatory coyote population by the Department of Fish and Wildlife

C Mild winter conditions that limited fawn losses due to starvation or exposure

D Epidemic disease that persists throughout the statewide deer herd

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 11
Science

Item: BI1712_02
Book Question Number: 2

Standard: HS-LS2-2

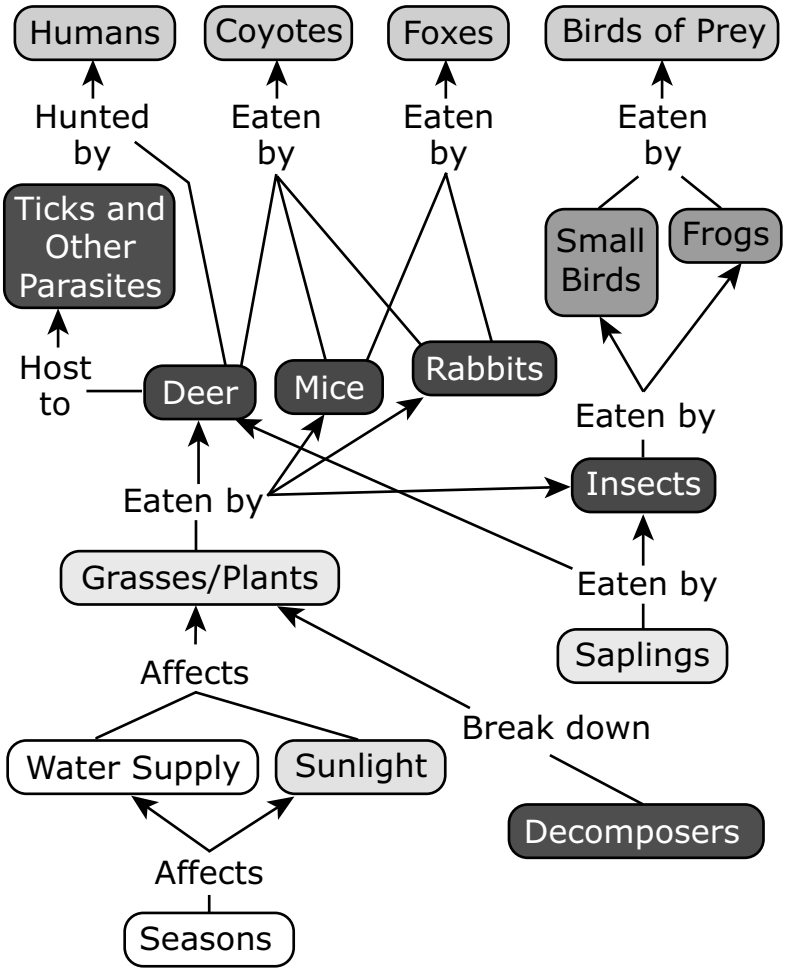
Item Type: MC
Key: A

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**21,809**	31%	0.31	31%	14%	18%	37%
Gender							
Female	**10,870**	32%	0.32	32%	14%	18%	36%
Male	**10,937**	31%	0.31	31%	14%	17%	39%
Ethnicity							
African American	**2,318**	34%	0.34	34%	21%	23%	23%
American Indian or Alaska Native	**32**	34%	0.34	34%	19%	16%	31%
Asian	**411**	36%	0.36	36%	13%	13%	39%
Hispanic or Latino	**1,891**	36%	0.36	36%	17%	20%	27%
Native Hawaiian or Pacific Islander	**31**	45%	0.45	45%	19%	13%	23%
White (non-Hispanic)	**16,186**	30%	0.30	30%	12%	17%	41%
Two or more races	**938**	36%	0.36	36%	15%	20%	29%
Migrant	**67**	33%	0.33	33%	15%	21%	31%
English Learner	**766**	33%	0.33	33%	29%	22%	16%
Economically Disadvantaged	**11,659**	32%	0.32	32%	16%	20%	32%
Students with Disabilities	**1,115**	33%	0.33	33%	19%	22%	25%

BI1712_00b

Figure 6 shows a food web for the local ecosystem where Taylor's grandfather's farm is located.

Figure 6



3

BI1712_03_3,4

The changes observed between Figure 4 and Figure 5 reflect changes in the ecosystem. Which organisms in the ecosystem (represented by the food web in Figure 6) would be **indirectly** impacted by a change in deer population?

Select **two** correct answers.

A Grass

B Saplings

C Insects

D Frogs

E Ticks

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 11
Science

Item: BI1712_03
Book Question Number: 3

Standard: HS-LS2-2

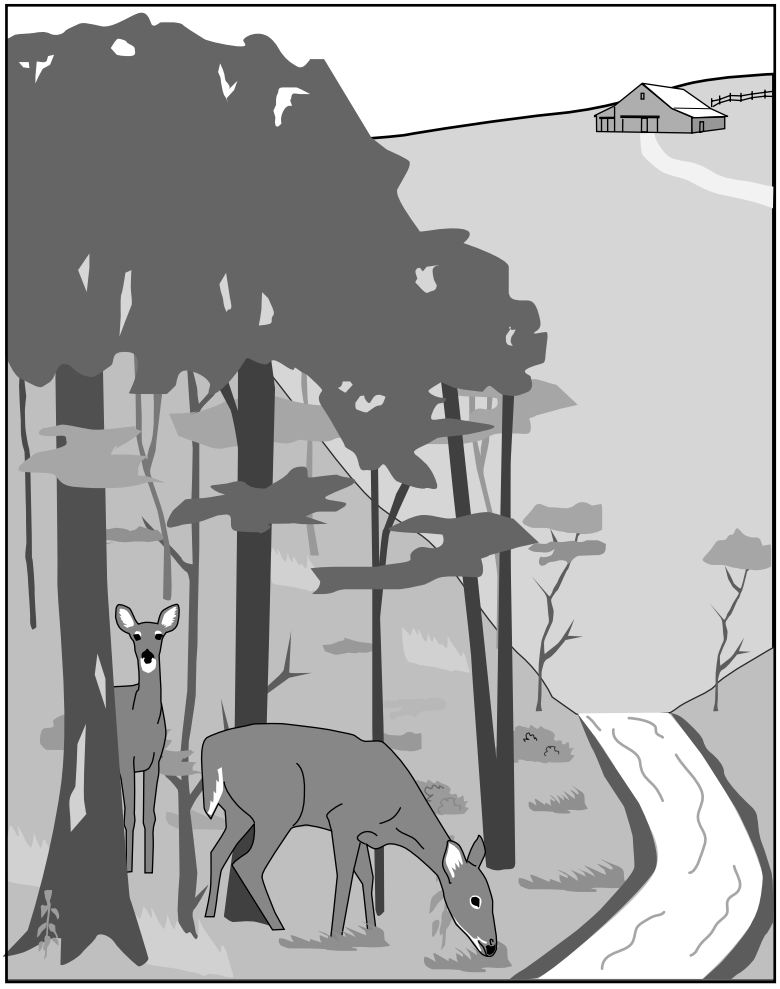
Item Type: MS
Key: C,D

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Score Percentages		
				Score 0 (%)	Score 1 (%)	Score 2 (%)
All Students	**21,807**	37.4%	0.75	49%	26%	24%
Gender						
Female	**10,869**	36.7%	0.73	50%	26%	24%
Male	**10,936**	38.0%	0.76	49%	26%	25%
Ethnicity						
African American	**2,319**	31.6%	0.63	51%	35%	14%
American Indian or Alaska Native	**32**	37.5%	0.75	53%	19%	28%
Asian	**411**	48.9%	0.98	41%	20%	39%
Hispanic or Latino	**1,891**	31.6%	0.63	55%	27%	18%
Native Hawaiian or Pacific Islander	**31**	24.2%	0.48	71%	10%	19%
White (non-Hispanic)	**16,184**	38.6%	0.77	49%	25%	26%
Two or more races	**937**	37.2%	0.74	49%	27%	24%
Migrant	**67**	29.1%	0.58	52%	37%	10%
English Learner	**765**	27.5%	0.55	52%	41%	7%
Economically Disadvantaged	**11,659**	33.2%	0.66	52%	29%	19%
Students with Disabilities	**1,114**	28.4%	0.57	54%	34%	11%

Taylor looked at photographs of a field on her grandfather's farm. Some of the photos were taken 50 years ago by her grandfather. She compared them with some pictures from 20 years ago.

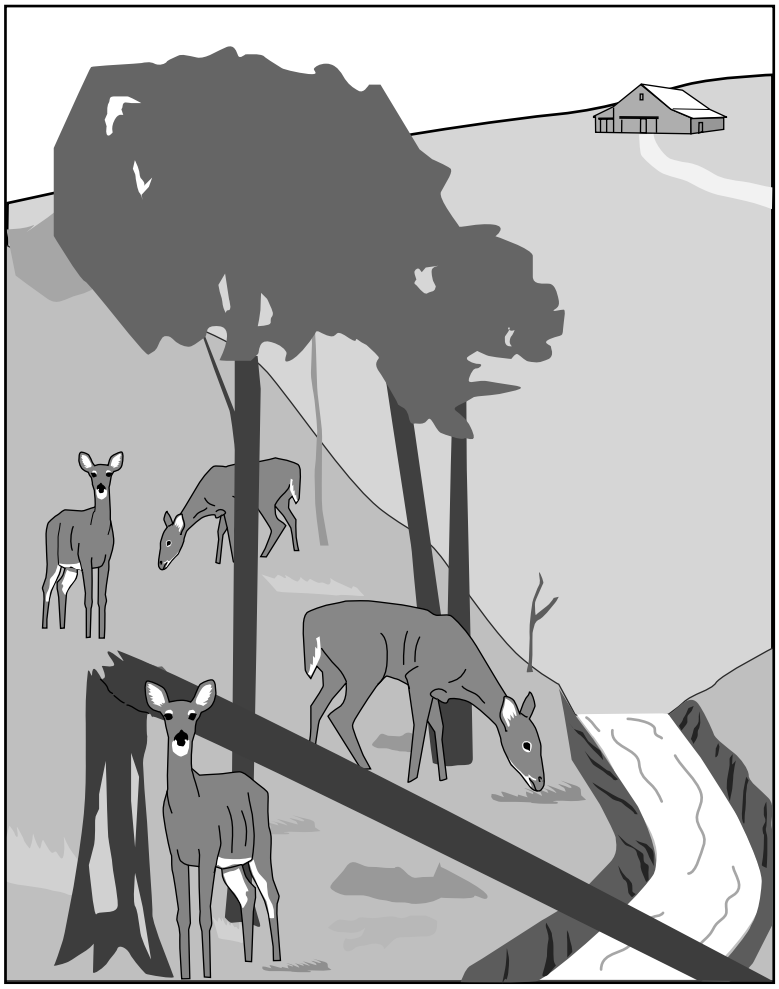
Figure 7: 50 Years Ago

Figure 8: 20 Years Ago



Viewing the old photos makes Taylor and her mom decide to visit her grandfather's farm. What they observe standing in the same place as when the earlier photos were taken is shown in Figure 9.

Figure 9: Present Day



4

BI1712_04_4

Considering the series of changes illustrated between Figures 7, 8, and 9, which observation indicates the **greatest** decrease in the long-term stability of the ecosystem?

A Drop in sapling prevalence

B Grass population variation

C Decline in deer health

D Creek bank change

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 11
Science

Item: BI1712_04
Book Question Number: 4

Standard: HS-LS2-2

Item Type: MC
Key: D

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**21,802**	14%	0.14	42%	31%	12%	14%
Gender							
Female	**10,868**	15%	0.15	39%	34%	12%	15%
Male	**10,932**	13%	0.13	45%	29%	13%	13%
Ethnicity							
African American	**2,317**	13%	0.13	24%	47%	16%	13%
American Indian or Alaska Native	**32**	13%	0.13	34%	28%	25%	13%
Asian	**411**	13%	0.13	48%	32%	7%	13%
Hispanic or Latino	**1,890**	13%	0.13	35%	38%	14%	13%
Native Hawaiian or Pacific Islander	**31**	16%	0.16	26%	48%	10%	16%
White (non-Hispanic)	**16,182**	15%	0.15	45%	28%	12%	15%
Two or more races	**937**	13%	0.13	39%	36%	12%	13%
Migrant	**67**	18%	0.18	30%	37%	15%	18%
English Learner	**764**	11%	0.11	17%	53%	20%	11%
Economically Disadvantaged	**11,655**	14%	0.14	37%	35%	14%	14%
Students with Disabilities	**1,115**	17%	0.17	32%	32%	19%	17%

BI1712_00d

Taylor thinks about the Kentucky deer population data from Figure 1 (in tab 1) and how it is related to the observations she made at her grandfather's farm.

5

BI1712_05_2

Which statement is **best** supported by Taylor's observations of the ecosystem changes over time?

A Predatory interactions reduced the number of organisms.

B Competition for resources between members of the same species limits the population size of that species.

C Cooperation in obtaining resources between members of different species limits the population size of both species.

D There are no limiting factors on the populations in this ecosystem.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 11
Science

Item: BI1712_05
Book Question Number: 5

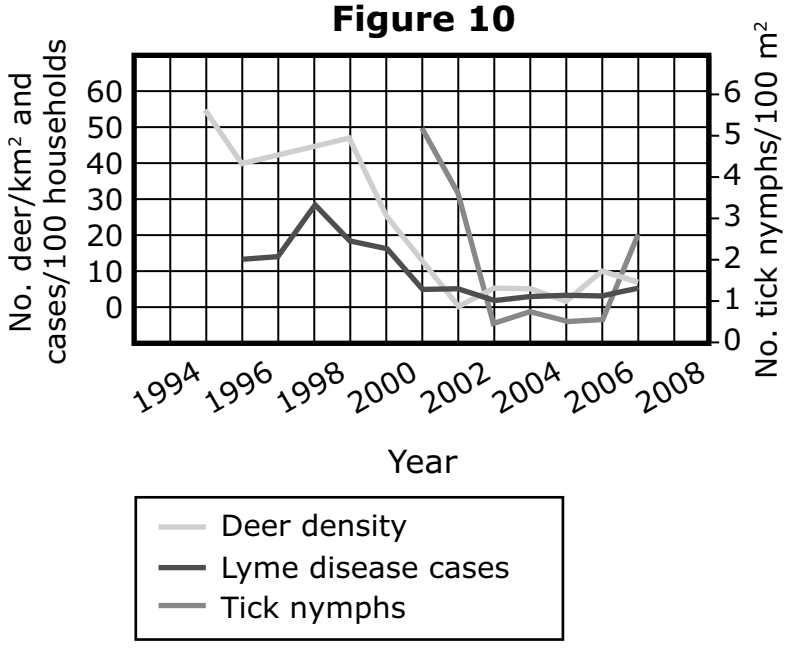
Standard: HS-LS2-2

Item Type: MC
Key: B

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**21,799**	52%	0.52	11%	52%	29%	8%
Gender							
Female	**10,869**	50%	0.50	11%	50%	31%	8%
Male	**10,928**	53%	0.53	12%	53%	26%	9%
Ethnicity							
African American	**2,318**	44%	0.44	13%	44%	32%	10%
American Indian or Alaska Native	**32**	59%	0.59	0%	59%	28%	13%
Asian	**410**	62%	0.62	9%	62%	21%	9%
Hispanic or Latino	**1,887**	49%	0.49	13%	49%	29%	9%
Native Hawaiian or Pacific Islander	**31**	39%	0.39	13%	39%	32%	16%
White (non-Hispanic)	**16,182**	53%	0.53	11%	53%	28%	8%
Two or more races	**937**	51%	0.51	11%	51%	29%	9%
Migrant	**67**	52%	0.52	9%	52%	31%	7%
English Learner	**761**	35%	0.35	17%	35%	38%	11%
Economically Disadvantaged	**11,651**	48%	0.48	12%	48%	30%	9%
Students with Disabilities	**1,115**	44%	0.44	15%	44%	30%	11%

Taylor learns from her reading that the increasing deer population is having other impacts, as well. Local governments are investigating the relationship between deer population density and Lyme disease. Lyme disease is transmitted through tick bites, and ticks feed on both deer and humans. The local governments discover a study done in another state that examined the relationship between deer, Lyme disease, and tick nymphs.

Figure 10



One government official claims that there is a relationship between the increasing deer population and an increased risk for Lyme disease.

6

BI1712_06_1

What relationship in the data in Figure 10 supports the government official's claim?

A An increase in deer density compared to the change in Lyme disease cases from 1994 to 2007

B The change in Lyme disease cases observed in 1998 and the change in deer density

C The increase in deer density in 2006 and the resulting change in Lyme disease cases

D The deer density increasing between 1998 and 2000 while Lyme disease cases decreased

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 11
Science

Item: BI1712_06
Book Question Number: 6

Standard: HS-LS2-1

Item Type: MC
Key: A

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**21,799**	19%	0.19	19%	46%	22%	14%
Gender							
Female	**10,863**	18%	0.18	18%	47%	20%	15%
Male	**10,934**	19%	0.19	19%	45%	23%	13%
Ethnicity							
African American	**2,318**	21%	0.21	21%	37%	24%	19%
American Indian or Alaska Native	**32**	9%	0.09	9%	38%	31%	22%
Asian	**410**	20%	0.20	20%	52%	17%	11%
Hispanic or Latino	**1,887**	18%	0.18	18%	44%	23%	15%
Native Hawaiian or Pacific Islander	**31**	26%	0.26	26%	45%	23%	6%
White (non-Hispanic)	**16,182**	18%	0.18	18%	47%	21%	13%
Two or more races	**937**	20%	0.20	20%	44%	22%	15%
Migrant	**67**	19%	0.19	19%	46%	21%	13%
English Learner	**761**	22%	0.22	22%	33%	24%	21%
Economically Disadvantaged	**11,652**	20%	0.20	20%	42%	22%	16%
Students with Disabilities	**1,114**	22%	0.22	22%	36%	24%	18%

7

BI1712_07_3

If the study is representative of the ecosystem in Taylor's community, what implications does this data have for the human population?

A The deer population must be reduced to 0 to see a meaningful reduction in Lyme disease.

B Once density reaches 40 deer/km^2, Lyme disease will become virtually uncontrollable.

C A stable population near 10 deer/km^2 is nearly as effective as completely eliminating the deer.

D Deer densities over 50 deer/km^2 become detrimental to the tick nymph population.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 11
Science

Item: BI1712_07
Book Question Number: 7

Standard: HS-LS2-1

Item Type: MC
Key: C

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**21,793**	47%	0.47	12%	20%	47%	20%
Gender							
Female	**10,861**	46%	0.46	12%	19%	46%	22%
Male	**10,930**	48%	0.48	12%	22%	48%	19%
Ethnicity							
African American	**2,313**	39%	0.39	15%	23%	39%	23%
American Indian or Alaska Native	**32**	53%	0.53	6%	13%	53%	28%
Asian	**410**	53%	0.53	10%	19%	53%	18%
Hispanic or Latino	**1,885**	42%	0.42	13%	22%	42%	22%
Native Hawaiian or Pacific Islander	**31**	45%	0.45	19%	23%	45%	13%
White (non-Hispanic)	**16,183**	49%	0.49	11%	20%	49%	20%
Two or more races	**937**	43%	0.43	14%	22%	43%	21%
Migrant	**66**	38%	0.38	17%	24%	38%	21%
English Learner	**757**	36%	0.36	19%	24%	36%	22%
Economically Disadvantaged	**11,648**	44%	0.44	12%	22%	44%	21%
Students with Disabilities	**1,112**	39%	0.39	13%	26%	39%	22%

In addition to the worry about Lyme disease, the city council has been receiving a number of complaints about the impact of the deer on humans. Complaints include the following:

- increased car-deer collisions
- grazing of bushes, shrubs, flowers, and gardens
- muddy and eroded local parks due to overgrazing
- damage to agricultural production

The council has been asked to develop a solution to the problem and is considering a number of possible options. They are considering the benefits and limitations of these options:

Figure 11

Option and Mechanism	Benefits	Negatives	Cost
Archery (bow) hunting: Hunters kill deer using a bow and arrow.	• quieter than firearms • provides meat for human consumption • arrows have greatly limited range compared to firearms (greater safety) • population decline is immediate	• limited range • requires skill • possibility of injured deer not being recovered • may not remove enough deer to produce desired effect • lethal to deer	Low: residents may even pay to hunt deer
Trapping and relocating: Deer are trapped, sedated, and transported to less-populated areas.	• nonlethal • population decline is immediate	• many deer do not survive trapping and relocating • requires a place to take the deer • deer in new environments are more likely to be hit by cars	Can be over $400/deer
Sterilization: Two options: trap deer and surgically sterilize them or use dart guns with birth control injections.	Nonlethal	• effectiveness is questionable • very labor-intensive • population decline is not immediate	As much as $1,000/ deer, including labor

Supplemental feeding: Provide food stations to attract deer away from populated areas.	Nonlethal	• may attract more deer • may increase reproduction due to better nutrition • concentrates population and may encourage spread of disease	$90/deer per year
Predator reintroduction: Natural predators, such as wolves or bobcats, are introduced to the area.	Predation is a natural means of controlling populations.	• introduced predators may cause worse problems than deer do • public concern over safety (children, pets) • populations tend to stabilize at relative high numbers of both species	Moderate initial cost, none after breeding populations are established
Firearm hunting: Hunters kill deer with firearms.	• proven solution to reduce deer populations • provides meat for human consumption • population decline is immediate	• safety concerns (stray bullets) • noise concerns • lethal to deer	Low: residents may even pay to hunt deer

8

BI1712_08

Consider the proposed solutions to the problem of deer overpopulation.

A. Construct an explanation for which option is the **best** solution. Explain why that option would be the best and what factors influenced your evaluation.

B. Construct an explanation for which option is the **least favorable** solution. Explain why that option would be the least favorable and what factors influenced your evaluation.

C. Explain how the proposed solutions might be refined to create the **best possible** solution. Explain why that would be the best possible solution. Note that you are not limited to only the ideas in the chart but are free to add original ideas of your own to create a best possible solution.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 11
Science

Item: BI1712_08
Book Question Number: 8

Standard: HS-LS2-7

Item Type: ER
Key: Rubric

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Score Percentages				
				Score 0 (%)	Score 1(%)	Score 2 (%)	Score 3 (%)	Score 4 (%)
All Students	**19,652**	52.4%	2.10	10%	16%	37%	28%	9%
Gender								
Female	**10,106**	55.3%	2.21	8%	13%	40%	29%	11%
Male	**9,544**	49.4%	1.98	13%	19%	33%	27%	8%
Ethnicity								
African American	**1,845**	38.9%	1.56	23%	20%	37%	16%	4%
American Indian or Alaska Native	**30**	54.2%	2.17	3%	17%	47%	27%	7%
Asian	**395**	65.6%	2.63	4%	7%	30%	39%	19%
Hispanic or Latino	**1,646**	47.6%	1.90	13%	19%	39%	23%	7%
Native Hawaiian or Pacific Islander	**28**	39.3%	1.57	21%	25%	32%	18%	4%
White (non-Hispanic)	**14,885**	54.4%	2.18	8%	15%	36%	30%	10%
Two or more races	**821**	49.8%	1.99	12%	17%	38%	24%	9%
Migrant	**58**	44.0%	1.76	26%	19%	17%	29%	9%
English Learner	**601**	25.8%	1.03	38%	28%	27%	6%	1%
Economically Disadvantaged	**10,201**	47.5%	1.90	13%	20%	38%	23%	7%
Students with Disabilities	**939**	35.7%	1.43	24%	27%	32%	13%	3%

	Kentucky Academic Standards Science Rubric
Score Point	**Description**
4	There is evidence in this response that the student has a complete and thorough understanding of the multi-dimensional question as evidenced by their explanation of the phenomenon and/or solution to the problem. The response is complete, thorough and correct and based on appropriate knowledge and skills The response does not contain errors or flaws in logical thinking or those flaws are irrelevant to the accuracy of the answer The response reflects complete synthesis and understanding of complex ideas The response is completely coherent and based on effective application of relevant dimensions (SEP and/or DCI and/or CC) The response integrates a solution that is completely correct and based on the principles of engineering design (if applicable)
3	There is evidence in this response that the student has a general understanding of the multi-dimensional question as evidenced by their explanation of the phenomenon and/or solution to the problem. The response is generally complete and the question is answered using appropriate knowledge and skills The response may contain minor errors or flaws in logical thinking and those flaws may or may not be irrelevant to the accuracy of the answer The response reflects a general synthesis and understanding of complex ideas The response is generally coherent and based on application of relevant dimensions (SEP and/or DCI and/or CC) The response integrates a solution that is generally correct and mostly based on the principles of engineering design (if applicable).
2	There is evidence in this response that the student has a limited understanding of the multi-dimensional question as evidenced by their explanation of the phenomenon and/or solution to the problem. The response is partially complete and/or the question is answered using limited understanding of knowledge and skills The response may contain significant errors or flaws in logical thinking The response reflects a limited synthesis and understanding of complex ideas The response may or may not be coherent and based on some application of relevant dimensions (SEP and/or DCI and/or CC) The response integrates a solution that is partly correct and may or may not be based on the principles of engineering design (if applicable).
1	There is evidence in this response that the student has a minimal understanding of the multi-dimensional question as evidenced by their explanation of the phenomenon and/or solution to the problem. The response is minimal and/or the question is answered using minimal understanding of knowledge and skills The response may contain major significant errors or flaws in logical thinking The response reflects a minimal synthesis and understanding of complex ideas The response is not coherent or is not based on application of relevant dimensions (SEP and/or DCI and/or CC) The response integrates a solution that is minimally correct and may or may not be based on the principles of engineering design (if applicable).
0	There is no evidence that the student has an understanding of the material related to the question being asked in terms of science content and logical thinking skills. The response is blank, entirely incorrect and/or irrelevant.

Anchor Set

A1

Deers come with all shape and sizes but the population is going down hill

Anchor Annotation, Paper 1
Score Point 0

There is no evidence that the student has an understanding of the material related to the question. The student does not identify or explain which option is the best solution nor which option is the least favorable solution and does not explain how the proposed solutions might be refined to create the best possible solution. The student provides a response (*Deers come with all shape and sizes but the population is going down hill*) that is irrelevant to the question.

if we had two many deer in the world then a lot of the lands would be ruined and alot of it would have not been

so good and there would be alot of problems

Anchor Annotation, Paper 2
Score Point 0

There is no evidence that the student has an understanding of the material related to the question. The student does not identify or explain which option is the best solution nor which option is the least favorable solution and does not explain how the proposed solutions might be refined to create the best possible solution. The student provides a response (*if we had two many deer in the world then a lot of the lands would be ruined and a lot of it would have not been so good and there would be a lot of problems*) that does not answer the question.

- The best solution is supplememtall feeding. this can help bring bck the deer population.
- The worst solution is using firearms, this brings down the populatio in deer

Anchor Annotation, Paper 3
Score Point 0

There is no evidence that the student has an understanding of the material related to the question. The student selects a best solution and a least favorable solution; however, for each of these solutions, the explanations of "why" indicate purposes that are contradictory to the intent of the question (*The best solution is supplememtal feeding, this can help bring bck the deer population; The worst solution is using firearms, this brings down the populatio in deer*). Additionally, the student does not explain how the proposed solutions might be refined to create the best possible solution. As such, the response is incorrect.

hunt the deer

Anchor Annotation, Paper 4
Score Point 1

There is evidence that the student has a minimal understanding of the question. The student identifies an option but does not identify whether it is the best solution or the least favorable solution nor explain "why" or what factors influenced the selection (*hunt the deer*). The student does not explain how the proposed solutions might be refined to create the best possible solution. Identification of only a single solution option, without providing further explanation of "why," reflects a minimal synthesis and understanding of complex ideas and is considered a very low score point 1.

I think that the best possible solution would be to trap and relocate deer. The reason I say this is because there are a lot of places out there that dont have as many deer or the population is very low. We could trap and relocate the deer to someplace where they really need the deer. This would also be the safest and most humane way to deal with the animals. Instead of killing the animals you would be giving them a new life and a new place to adapt to and start a new life.

Anchor Annotation, Paper 5
Score Point 1

There is evidence that the student has a minimal understanding of the question. The student selects a solution option and explains "why" it is the best solution (*the best possible solution would be to trap and relocate deer … because there are a lot of places … that don't have as many deer …This would be the safest and most humane way to deal with the animals. Instead of killing the animals you would be giving them … a new place to adapt to and start a new life*). The student does not identify a least favorable solution nor explain how the proposed solutions might be refined to create the best possible solution. Identification of a best solution option with an explanation of "why" reflects a minimal synthesis and understanding of complex ideas and is considered a higher-level score point 1.

trapping and re I oar ng, less deer get hurt cost: less

firearm hunting, more money and deer get hurt

Anchor Annotation, Paper 6
Score Point 1

There is evidence that the student has a minimal understanding of the question. The student identifies a best solution and a least favorable solution and minimally identifies what factors influence these selections (*trapping and [relocating], less deer get hurt cost: less … firearm hunting, more money and deer get hurt*). The student does not explain how the proposed solutions might be refined to create the best possible solution. Identification of the best and least favorable solutions with a minimal explanation, i.e., indicating two factors for each solution without further explanation, reflects a minimal synthesis and understanding of complex ideas and is considered a higher-level score point 1.

Note: Interpret a brief response such as this one as an extension of the question, including the order of its corresponding parts.

I think that I would go with the Archery hunting. I agree with this because like listed bows are 100% quiter than firearms and it could be an advantage for humans because of the meat involved, also arrows are much safer than a firearm. Although it may take a little longer to get rid of the deer population its much safer and less harmful to the animals.

My least favorite is the "Trapping and relocating" this is my least favorite because one of the main points is to slow down car collisions and relocating them will only cause car colliisions in the area to which they would be moved.

Anchor Annotation, Paper 7
Score Point 2

There is evidence that the student has a limited understanding of the question. The student selects a best solution and a least favorable solution and provides relevant explanations of "why" for both options (*I think that I would go with the Archery hunting ... bows are 100% [quieter] than firearms ... an advantage for humans because of the meat involved ... arrows are much safer than firearm ... Although it may take a little longer to get rid of the deer population its much safer and less harmful to the animals; My least favorite is the 'Trapping and relocating' ... because one of the main points is to slow down car collisions and relocating them will only cause car colliision in the area to which they would be moved*). However, the student does not address the third element of the question. As a result, holistically the response is partially complete and reflects limited synthesis and understanding of the complex ideas associated with the issue.

A. I think option 4 (supplemental feeding) would be the best option. I chose this because it is not harmful to the deer and has a moderately low cost of $90/deer per year. it will hopefully keep the deer away from populated areas, keeps them with other deer

B. i think option 6 (firearm hunting) would be the worse option . I think because it is harmful to the deer and could cause some one else to get hurt like a child if it is close to a populated area.

C. I think that moving some of the deer from the overpopulated places in to lees populated areas is the best options yes there would be a cost but you would only have to do it once every one to two years, it is not harmful to the deer and/or other people.

Anchor Annotation, Paper 8
Score Point 2

There is evidence that the student has a limited understanding of the question. The student selects a best solution and a least favorable solution and provides explanations of "why" for both options (*supplemental feeding would be the best option. ... it is not harmful to the deer and has a moderately low cost ... it will ... keep the deer away from populated areas; firearm hunting would be the worse option. ... it is harmful to the deer and could cause some one else to get hurt*). The student selects an additional solution option from Figure 11 as the best possible solution and provides supporting reasons (*moving some of the deer from the overpopulated places in to lees populated areas is the best options ... there would be a cost but you would only have to do it once every two years, it is not harmful to the deer and/or other people*); however, there is no attempt to refine this solution. Overall, this response is partially complete and reflects a limited synthesis and understanding of complex ideas.

A. firearm humting because its proven to work.

B. supplemental feeding because that will attracts more deer and increase the population.

c. all year round hunting, it w1il decrease the deer population fast and easy.

Anchor Annotation, Paper 9
Score Point 2

There is evidence that the student has a limited understanding of the question. The student selects a best solution and a least favorable solution and provides limited explanations of "why" for both options (*firearm humting because its proven to work; supplemental feeding because that will attracts more deer and increase the population*). The student also provides a refined solution with a limited explanation of "why" this would be the best possible solution (*all year round hunting, it will decrease the deer population fast and easy*). Overall, the student has identified correct solution options and provided limited explanations of "why" for all parts of the question, reflecting a limited synthesis and understanding of complex ideas. Holistically, this is considered a higher-level score point 2.

Note: A similarly-structured response with stronger, more generally complete explanations would be reflective of the score point 3 range.

Useing fire arms to contral population would be the best option .There are many reasons why this method would be the most efetive. People could use them for food and poeple enjoy inting the animlas for sport. This would aslo give you good way to control the populaton. The worst option would be trying to bait the deer to diffrent areas. This gives you know way to stop the population from growing . The deer will also go where every the want to find food so placeing food wont make the stay there. You could give people a licence telling them how many deer they can harvest. You could also just expand the deer hunting season.

Anchor Annotation, Paper 10
Score Point 3

There is evidence that the student has a general understanding of the question. The student selects a best solution and a least favorable solution and provides explanations of "why" for both options (*Useing fire arms ... would be the best option. ... People could use them for food and poeple enjoy inting the animals for sport. This would aslo give you good way to control the populaton;The worst option would be trying to bait the deer to diffrent areas. This gives you know way to stop the population from growing. The deer will also go where every the want to find food so placeing food wont make the stay there*). The student also provides a refined solution (*You could give people a licence telling them how many deer they can harvest. You could also just expand the deer hunting season*) but does not explain "why" this would be the best possible solution. Identification of the best and least favorable solutions supported by generally complete explanations of "why," along with a specification of how the solutions can be refined to create the best possible solution, even without further explanation, reflects a general synthesis and understanding of complex ideas. Overall, this response is considered a lower score point 3.

A. The best solution i think to this problem is limited firearm hunting. This will cause the population to decrease and is also low cost. there are some backsides to this plan but there could be limitations

B. the least favorable one is adding predators to the population. This is dangerous and could cause to many deadly predators in residental areas

C. A refined solution is to limit the amount of deer able to be hunted and to limit where you can hunt. this limits the danger and makes it more safe

Anchor Annotation, Paper 11
Score Point 3

There is evidence that the student has a general understanding of the question. The student selects a best solution and a least favorable solution and provides explanations of "why" for both options (*The best solution … is limited firearm hunting. This will cause the population to decrease and is also low cost; the least favorable one is adding predators to the population. This is dangerous and could cause [too] many deadly predators in residential areas*). The student also provides a refined solution with an explanation of "why" this would be the best possible solution (*A refined solution is to limit the amount of deer able to be hunted and to limit where you can hunt. this limits the danger and makes it more safe*). Overall, the student has identified correct options and provided generally complete explanations for all parts of the question, which reflects a general synthesis and understanding of complex ideas. Compare to Anchor 9 to clarify the 2/3 score point line.

A. Firearm hunting would be the solution to the problem by both suppling meat and decreasing the poplation of deer. By firearm hunting it is a low cost way of lowering the population of deer.

B .. Introducing a predator would just lead to more problems later on by attacks from them to human lives.

C. By add bow hunting along with firearm hunting would just let to lead to steedy lowering the population over time with little cost at all.

Anchor Annotation, Paper 12
Score Point 3

There is evidence that the student has a general understanding of the question. The student selects a best solution and a least favorable solution and provides explanations of "why" for both options (*Firearm hunting would be the solution to the problem by both suppling meat and decreasing the poplation of deer. ... it is a low cost way of lowering the population of deer; Introducing a predator would just lead to more problems later on by attacks from them to human lives*). The student also creates a refined solution with an explanation of "why" this would be the best possible solution (*By add bow hunting along with firearm hunting would just let to lead to steedy lowering the population over time with little cost at all*). Overall, the student has identified correct options and provided generally complete explanations for all parts of the question, which reflects a general synthesis and understanding of complex ideas.

Note: A similarly-structured response with stronger, thoroughly complete explanations would be reflective of the score point 4 range.

The best way to control the rising deer population would be firearm hunting. It is already proven to be an effective solution, it is cost efficent and the meat can be used for human consumption. Though there is some concern about safety, there are numerous classes and cousres that teach proper hunting saftey and ettiquette.

The least favorable solution would be to sterilize the deer. The only benefits is that it's nonlethal. The effect of that plan is questionable, the effect on population is not immediate, and it is extremely expensive to sterilize even one deer, let alone enough to effect the population.

The best way to quicky and effectively decrease deer population would be to either increase the length of hunting season or increase the limit of deer each registered hunter is allowed to bag each season. By doing this for a few years, there will be a significant drop in deer numbers, to a more manageable level.

Anchor Annotation, Paper 13
Score Point 4

There is evidence that the student has a complete and thorough understanding of the question. The student selects a best solution and a least favorable solution and provides explanations of "why," including discussions of the pros and cons, for both options (*The best way … would be firearm hunting. It is already proven to be an effective solution, it is cost efficent, and the meat can be used for human consumption. Though there is some concern about safety, there are numerous classes and cousres that teach proper hunting saftey and ettiquette; The least favorable solution would be to sterilize the deer. The only benefit is that it's nonlethal. The effect of this plan is questionable, the effect on population is not immediate, and it is extremely expensive*). The student also creates a refined solution with an explanation of "why" this would be the best possible solution (*The best way to quickly and effectively decrease deer population would be to either increase the length of hunting season or increase the limit of deer each registered hunter is allowed to bag each season. By doing this for a few years, there will be a significant drop in deer numbers, to a more manageable level*). Overall, the student has identified correct solution options and provided complete and thorough explanations, which reflects a complete synthesis and understanding of complex ideas. Compare to A12 to clarify the 3/4 score point line.

A.
I believe that the bet possible solution for this area would be the trapping and relocation of the deer. Not all the deer would have to be re located, just a large enough number to be able to see the difference in population. While this is sort of costly, the deer would not be lethally harmed on purpose. The deer population would adapt and become suitable to the different environment they would be relocated to, so the fact that they would not know the environment would be hard to adjust to at first, but long term wise it helps to decrease the population in the area that needed it.
B.
I believe that the least favorable option would most definitely have to be the sterilization of the deer to eradicate the possibility of natural reproduction and increase the population. First of all it is very costly and the effectiveness if not proven to work. the population decline would not be immediate, and it requires intensive labor work. In this situation, the negatives most definitely out way the positives, making this the least favorable solution to the deer population problem.
C.
All of these options could be altered and refines to include other ways to make them the best solution. For example, you can take the option to re locate some of the deer population and alter it to include the hunting of deer in the area to include either bow or gun hunting. This immediately controls the population of the deer while also giving more resources to the humans in the area. So hypothetically speaking, you could decrease the population in many ways, while also combining the available options to include different aspects of the different options making it better suit the problem at hand in this neighborhood.

Anchor Annotation, Paper 14
Score Point 4

There is evidence that the student has a complete and thorough understanding of the question. The student selects a best solution and a least favorable solution and provides explanations of "why" by discussing of the pros and cons of both options (*the bet possible solution … would be the trapping and relocation of the deer. … just a large enough number to be able to see the difference in population. While this is sort of costly, the deer would not be lethally harmed on purpose. The deer population would adapt … but long term wise it helps to decrease the population in the area that needed it; the least favorable option would … be the sterilization of the deer… it is very costly and the effectiveness if not proven to work. the population decline would not be immediate, and it requires intensive labor work. … the negatives most definitely out way the positives, making this the least favorable solution*). The student also creates a refined solution with an explanation of "why" this would be the best possible solution (*take the option to re locate some of the deer population and alter it to include the hunting of deer in the area to include either bow or gun hunting. This immediately controls the population of the deer while also giving more resources to the humans in the area*). Overall, the student has identified correct solution options and provided complete and thorough explanations, which reflects a complete synthesis and understanding of complex ideas.

A. The best option to reduce the deer population is hunting them with a firearm . The reason I beileve this solution should be used, and not the other solutions is because it will be the most affective. If hunters used a bow you may not kill the deer completely, letting it get away, plus you have to be highly trained to be affective with a bow and arrow. If we used trapping and relocating or sterilizaton it will not solve any thing because the deer would be relocated in a different spot causing someone else to have a deer population problem. The benefits of using a firearm are it is proven that hunting with a firearm will reduce deer population immediately. Also it will give us humans deer meat for food. lastly it will actually give the city council money because alot of people will want to pay to hunt these overpopulated deer. The main factor that made me choose hunting with a firearm is that it will kill the deer on the spot and we will not have to worry about it anymore.

B. The least favorable solution would be trapping and relocating. I believe this because if the city council ecides to relocate the deer, th is is giving the deer problem to sombody else and this is not right This is the main rason I choose this answer, and also because every deer that is trapped will cost the city council a solid four hundred dollars a deer.

C.The best option for what to do with the deer is to let people come in and hunt them how they want too, wheter it's with a rifle, bow, shotgun, or maybe even a paintball gun. The reason I say this is because if the city can get rid of their deer any way they can, and not re locate them the deer population will be solved. The city co un cil should not relocate the deer even if they are steralized is because the deer will still eat and erode away all of the soil. This will leave alot of people unhapppy because they will come home from work, and their yard will be torn to bits. So in my opinion letting people hunt the deer how they want, and kill ing them will solve the deer overpopulation problem.

Anchor Annotation, Paper 15
Score Point 4

There is evidence that the student has a complete and thorough understanding of the question. The student selects a best solution and a least favorable solution and provides explanations of "why" by comparing/contrasting the benefits of the option selected to the other options available (*The best option … is hunting them with a firearm. … it will be the most affective … If hunters used a bow you may not kill the deer completely … plus you have to be highly trained to be affective with a bow and arrow. If we used trapping and relocating or sterilization … the deer will be relocated in a different spot causing someone else to have a deer population problem. … it is proven that hunting with a firearm will reduce deer population immediately. Also it will give us humans deer meat for food. lastly … alot of people will want to pay to hunt these overpopulated deer. … it will kill the deer on the spot and we will not have to worry about it anymore; The least favorable solution would be trapping and relocating. … this is giving the deer problem to sombody else and this is not right. … also … every deer that is trapped will cost … four hundred dollars a deer*). The student also creates a refined solution with an explanation of "why" this would be the best possible solution (*The best option … is to let people come in and hunt them how they want too, wheter it's with a rifle, bow, shotgun … and not relocate them … because the deer will eat and erode away all the soil … letting people hunt the deer how they want, and killing them will solve the deer overpopulation problem*). Overall, the student has identified correct solution options and provided complete and thorough explanations, which reflects a complete synthesis and understanding of the complex ideas associated with the issue.

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