Kentucky Summative Assessments

Grade 4 Science
Released Items
2024

The zoo had an exhibit called "Living and Working Together" that showed different organisms that form groups to help themselves survive. Cindy visited the zoo and observed a number of different groups on exhibit. She learned the different ways they interact to help themselves survive. The charts describe the exhibits she saw.

Zoo Exhibits

Animal	Group Structure and Size	Roles	Jobs	Beneficial Behaviors
Termites	Colony: 4,800 termites–300,000 termites	King	Reproduction	Gather food Swarm to start new colony Division of labor
		Queen	Reproduction	
		Workers	Build and repair nest, feed others	
		Soldiers	Protection, feed others	
Ants	Colony: 36 ants–Millions of ants	Princess	Starting new colony	Division of labor Solve complex problems
		Drone	Reproduction	
		Queen	Reproduction	
		Worker	Cultivate	
		Soldiers	Protection	

Zoo Exhibits

Animal	Group Structure and Size	Roles	Jobs	Beneficial Behaviors
Naked Mole Rats	Colony: 20 naked mole rats–300 naked mole rats	Queen	Reproduction	Division of labor
		Male	Gather food	
		Workers	Maintain nest	
		Soldiers	Protection	
Wolves	Roaming pack: 8 wolves–15 wolves	Alpha	Main leader	Cooperate to hunt as a pack Can change to different roles as others age or die
		Beta	Keep order, replace Alpha when needed	
		Adults	Protectors, hunters	
		Juveniles	Fed by and learn from adults	
Zebras	Roaming herd: 7 adult zebras plus young zebras	Stallion	Reproduction leader	Mutual grooming Join with other zebra groups for protection
		Mare	Reproduction	
		Offspring		

1

SC041606_01_3,1

Which of these claims about the behaviors of organisms that form groups is supported by the charts?

Select the TWO **best** answers.

A Most large animals tend to form smaller groups.

B Most groups have roles involved in changing their environment.

C Most groups have roles involved in food production and gathering.

D Most groups have a system of sharing information and communicating.

E Most groups have a leader whose job it is to protect the group.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 4
Science

Item: SC041606_01
Book Question Number: 1

Standard: 3-LS2-1

Item Type: MS
Key: A,C

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Score Percentages		
				Score 0 (%)	Score 1 (%)	Score 2 (%)
All Students	**22,025**	47.9%	0.96	22%	60%	18%
Gender						
Female	**10,726**	46.3%	0.93	24%	60%	16%
Male	**11,298**	49.5%	0.99	21%	59%	20%
Ethnicity						
African American	**2,216**	43.3%	0.87	27%	60%	13%
American Indian or Alaska Native	**37**	40.5%	0.81	30%	59%	11%
Asian	**461**	49.9%	1.00	18%	65%	17%
Hispanic or Latino	**1,857**	44.3%	0.89	26%	59%	15%
Native Hawaiian or Pacific Islander	**41**	36.6%	0.73	41%	44%	15%
White (non-Hispanic)	**16,124**	49.0%	0.98	21%	59%	19%
Two or more races	**1,287**	47.1%	0.94	23%	60%	17%
Migrant	**94**	39.4%	0.79	32%	57%	11%
English Learner	**1,540**	40.8%	0.82	29%	60%	11%
Economically Disadvantaged	**13,888**	46.1%	0.92	24%	60%	16%
Students with Disabilities	**3,161**	46.1%	0.92	24%	60%	16%

SC041606_00a

Cindy saw that the sizes of the groups vary greatly. She asked if organisms that live in smaller groups depend on each other less than organisms that live in larger groups.

2

SC041606_02_1

What one piece of new information would Cindy **most likely** need in order to make a claim about whether organisms that live in smaller groups depend on each other less than the ones living in larger groups?

A If group members can take on other roles

B If all roles are made up of equal numbers of organisms

C Whether the group needs to migrate to survive

D Whether some roles are only done by males or females

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 4
Science

Item: SC041606_02
Book Question Number: 2

Standard: 3-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	**22,024**	31%	0.31	31%	30%	21%	18%
Gender							
Female	**10,726**	30%	0.30	30%	30%	22%	18%
Male	**11,297**	32%	0.32	32%	30%	20%	18%
Ethnicity							
African American	**2,215**	25%	0.25	25%	35%	23%	17%
American Indian or Alaska Native	**37**	32%	0.32	32%	32%	16%	19%
Asian	**461**	33%	0.33	33%	31%	19%	17%
Hispanic or Latino	**1,857**	27%	0.27	27%	30%	26%	17%
Native Hawaiian or Pacific Islander	**41**	29%	0.29	29%	32%	22%	17%
White (non-Hispanic)	**16,124**	32%	0.32	32%	29%	20%	18%
Two or more races	**1,287**	30%	0.30	30%	30%	23%	17%
Migrant	**94**	19%	0.19	19%	24%	36%	20%
English Learner	**1,541**	23%	0.23	23%	33%	28%	16%
Economically Disadvantaged	**13,888**	28%	0.28	28%	31%	23%	18%
Students with Disabilities	**3,160**	27%	0.27	27%	29%	22%	22%

SC041606_00b

Cindy realized that even though all the organisms have the same basic needs for food and water, shelter, reproduction, and defense, the group structures and sizes can be different.

3

SC041606_11_4

When comparing the following pairs of animals, which pair represents **two** different groups of animals that meet the same basic need for protection, but in different ways?

A Termites and ants

B Ants and Mole rats

C Mole rats and wolves

D Wolves and zebras

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 4
Science

Item: SC041606_11
Book Question Number: 3

Standard: 3-LS2-1

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	**22,025**	20%	0.20	43%	20%	17%	20%
Gender							
Female	**10,726**	21%	0.21	40%	21%	17%	21%
Male	**11,298**	19%	0.19	45%	19%	16%	19%
Ethnicity							
African American	**2,215**	19%	0.19	41%	23%	17%	19%
American Indian or Alaska Native	**37**	16%	0.16	41%	22%	22%	16%
Asian	**461**	19%	0.19	41%	20%	21%	19%
Hispanic or Latino	**1,858**	21%	0.21	40%	21%	17%	21%
Native Hawaiian or Pacific Islander	**41**	12%	0.12	56%	17%	15%	12%
White (non-Hispanic)	**16,124**	20%	0.20	44%	19%	17%	20%
Two or more races	**1,287**	20%	0.20	43%	22%	16%	20%
Migrant	**94**	20%	0.20	44%	20%	16%	20%
English Learner	**1,541**	21%	0.21	40%	22%	17%	21%
Economically Disadvantaged	**13,889**	21%	0.21	42%	20%	17%	21%
Students with Disabilities	**3,160**	24%	0.24	37%	20%	19%	24%

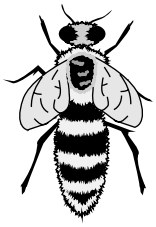
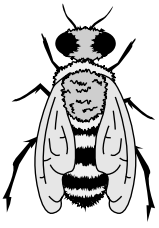
SC041606_00c

After coming home, Cindy observed her neighbor's backyard beehive and realized that the bees were also part of a group. She decided to study the bees more closely. She discovered that not all bees are the same and that bees all work together in the group.

Things Cindy saw:

There were lots of bees. Some were flying in and out of the hive. Some were crawling around the opening of the hive. Cindy saw a bee much larger than the others. One bee landed close to Cindy, and she could see a yellow substance on its legs.

Things Cindy learned from reading:

Type of Bee	Roles and Responsibilities	How Many in a Bee Colony	Physical Appearance
Queen	Lays eggs Fed by worker bees Leaves nest to mate with drone	1	
Worker (females)	Takes care of larvae Builds and cleans nest Gathers nectar and pollen Feeds drones and queen	10,000–50,000	
Drone (males)	Leaves nest to mate Fed by worker bees	100–500	

4

SC041606_04_1

Based on Cindy's observations and the data from the bee colony chart, what one claim can Cindy **most likely** make about how the different types of bees in a group help each other survive?

A All bees have specific roles to help each other survive.

B Some bees can change types to help each other survive.

C All bees share the same roles to help each other survive.

D Some bees are a type that is not necessary to help each other survive.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 4
Science

Item: SC041606_04
Book Question Number: 4

Standard: 3-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	**22,024**	73%	0.73	73%	9%	9%	9%
Gender							
Female	**10,727**	74%	0.74	74%	9%	9%	9%
Male	**11,296**	72%	0.72	72%	9%	10%	9%
Ethnicity							
African American	**2,215**	58%	0.58	58%	15%	14%	13%
American Indian or Alaska Native	**37**	78%	0.78	78%	8%	8%	5%
Asian	**461**	80%	0.80	80%	6%	6%	8%
Hispanic or Latino	**1,857**	68%	0.68	68%	13%	11%	8%
Native Hawaiian or Pacific Islander	**41**	63%	0.63	63%	7%	15%	15%
White (non-Hispanic)	**16,124**	76%	0.76	76%	8%	9%	8%
Two or more races	**1,287**	70%	0.70	70%	9%	11%	10%
Migrant	**94**	62%	0.62	62%	13%	15%	11%
English Learner	**1,539**	62%	0.62	62%	15%	13%	10%
Economically Disadvantaged	**13,887**	69%	0.69	69%	10%	11%	10%
Students with Disabilities	**3,161**	63%	0.63	63%	12%	13%	12%

5 SC041606_05_2

Which one statement provides the **best** evidence to support Cindy's claim about how a beehive works as a group to help the bees survive?

A All bee types have similar body structures that allow them to function in the group.

B Different bees do specific jobs that all support the other bees in the group.

C The number of bees of each type varies greatly depending on their role.

D Worker bees make up the largest number of bees in the group.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 4
Science

Item: SC041606_05
Book Question Number: 5

Standard: 3-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	**22,012**	65%	0.65	13%	65%	14%	9%
Gender							
Female	**10,720**	65%	0.65	13%	65%	13%	9%
Male	**11,291**	64%	0.64	12%	64%	14%	9%
Ethnicity							
African American	**2,214**	57%	0.57	16%	57%	16%	11%
American Indian or Alaska Native	**37**	54%	0.54	14%	54%	14%	19%
Asian	**461**	73%	0.73	11%	73%	11%	5%
Hispanic or Latino	**1,849**	62%	0.62	13%	62%	14%	10%
Native Hawaiian or Pacific Islander	**41**	54%	0.54	17%	54%	20%	10%
White (non-Hispanic)	**16,121**	66%	0.66	12%	66%	13%	9%
Two or more races	**1,287**	63%	0.63	14%	63%	13%	10%
Migrant	**94**	46%	0.46	14%	46%	23%	17%
English Learner	**1,532**	59%	0.59	14%	59%	14%	12%
Economically Disadvantaged	**13,882**	61%	0.61	14%	61%	14%	11%
Students with Disabilities	**3,159**	53%	0.53	14%	53%	16%	18%

SC041606_00d

Cindy learned that the worker bee role is complex. Each worker bee goes through a sequence of jobs throughout its life. Not all bees are at the same stage in the sequence at the same time because bees continue to hatch through the season.

Timeline of a Worker Bee's Life:

Day 1–2: **House Bee**- cleans empty cells so they can be used again

Day 3–7: **Beginning Nurse Bee**- feeds pollen and honey to worker larvae

Day 8–11: **Advanced Nurse Bee**- feeds royal jelly to the queen larva and feeds drone and worker larvae

Day 12–17: **Wax Bee**- builds honeycomb cells from wax, stores pollen and nectar

Day 18–21: **Guard Bee**- stays near the hive entrance to protect from intruders

Day 22–42: **Forager Bee** - flies away from the hive to gather nectar and pollen

She thought about this pattern and why each bee does so many different jobs during its life.

6

SC041606_06_1,3

Which of these statements explains how the changing roles of worker bees benefit the colony?

Select the TWO **best** answers.

A Most of their lives are spent bringing needed resources back to the group.

B The need for protection changes throughout the season.

C All jobs will have a supply of replacement workers.

D More bees are available to perform nurse roles.

E The easiest roles of the colony are carried out by the youngest bees.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 4
Science

Item: SC041606_06
Book Question Number: 6

Standard: 3-LS2-1

Item Type: MS
Key: A,C

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Score Percentages		
				Score 0 (%)	Score 1 (%)	Score 2 (%)
All Students	**22,012**	51.1%	1.02	17%	63%	19%
Gender						
Female	**10,721**	50.7%	1.01	17%	64%	18%
Male	**11,290**	51.5%	1.03	17%	62%	20%
Ethnicity						
African American	**2,213**	50.2%	1.00	19%	63%	19%
American Indian or Alaska Native	**37**	59.5%	1.19	5%	70%	24%
Asian	**461**	53.7%	1.07	12%	69%	19%
Hispanic or Latino	**1,848**	51.3%	1.03	16%	66%	18%
Native Hawaiian or Pacific Islander	**41**	61.0%	1.22	7%	63%	29%
White (non-Hispanic)	**16,123**	51.0%	1.02	18%	63%	20%
Two or more races	**1,287**	51.9%	1.04	16%	65%	20%
Migrant	**93**	53.2%	1.06	18%	57%	25%
English Learner	**1,530**	50.8%	1.02	18%	63%	19%
Economically Disadvantaged	**13,881**	51.0%	1.02	18%	62%	20%
Students with Disabilities	**3,160**	49.0%	0.98	21%	61%	19%

SC041606_00e

Cindy learned that honeybees do not hibernate during the winter, but they do other things to improve the chances of the group surviving over the winter.

7

SC041606_07_3

Which one behavior **most likely** has the purpose of helping the group increase the chance of the hive's survival by conserving resources?

A Workers stop foraging for food.

B Bees eat stored honey for energy.

C The drones are forced out of the hive.

D Worker bees surround the queen to help keep her warm.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 4
Science

Item: SC041606_07
Book Question Number: 7

Standard: 3-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	**22,016**	12%	0.12	10%	49%	12%	29%
Gender							
Female	**10,721**	11%	0.11	10%	50%	11%	29%
Male	**11,294**	13%	0.13	11%	48%	13%	29%
Ethnicity							
African American	**2,216**	13%	0.13	12%	44%	13%	31%
American Indian or Alaska Native	**37**	14%	0.14	5%	46%	14%	35%
Asian	**460**	11%	0.11	7%	54%	11%	28%
Hispanic or Latino	**1,849**	13%	0.13	10%	45%	13%	32%
Native Hawaiian or Pacific Islander	**41**	15%	0.15	12%	41%	15%	32%
White (non-Hispanic)	**16,125**	11%	0.11	10%	50%	11%	29%
Two or more races	**1,286**	13%	0.13	11%	49%	13%	28%
Migrant	**93**	18%	0.18	8%	47%	18%	27%
English Learner	**1,530**	13%	0.13	11%	42%	13%	35%
Economically Disadvantaged	**13,884**	12%	0.12	11%	47%	12%	30%
Students with Disabilities	**3,161**	14%	0.14	11%	42%	14%	33%

Cindy discovered that the number of honeybees in the world is dropping as a result of environmental changes. The chart shows some of the changes to the honeybees' environment and some proposed solutions.

Factors Impacting Honeybee Populations

Factors	Proposed Solutions	Benefits	Negatives
Chemical spray use	Ban or reduce use of some chemical sprays	Less poisonous substances to harm honeybees	Insects may damage more food crops
Lack of basic needs	Plant more honeybee-friendly flowers	Provides more food	Cost of planting, prevents land being used for crops
	Don't mow weeds and wild flowers	No cost, provides more food	People may object to unattractive growth
	Grow a greater variety of food crops that bloom at different times of year	More variety of food sources, food available during more of the year	Crop planting decisions are based on economic demand for food, not honeybee needs
	Provide manufactured honeybee hives	Provides honeybees a secure shelter against the elements	Increased chance of honeybee stings in populated areas
Lack of human understanding	Educate the public about the importance of honeybees to world food supply	Informed people can make better choices	People can choose not to act on the information

Cindy would like to find a way for her local community to improve the health of honeybees. She knows that some of these proposed solutions can be done locally, while others would require help from outside her community.

8

SC041606_08

Identify two of the proposed solutions that could be done in Cindy's neighborhood.

Make a claim about why each solution is a good choice of something to do in her neighborhood to improve the health of the local bee population.

Released Item Performance

Kentucky Summative Assessments

Spring 2024
Grade 4
Science

Item: SC041606_08
Book Question Number: 8

Standard: 3-5-ETS1-2, 3-LS2-1

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	**21,526**	28.9%	1.15	38%	27%	20%	14%	2%
Gender								
Female	**10,558**	30.0%	1.20	37%	25%	21%	14%	2%
Male	**10,967**	27.8%	1.11	38%	28%	20%	13%	1%
Ethnicity								
African American	**2,105**	18.9%	0.76	56%	22%	14%	8%	1%
American Indian or Alaska Native	**36**	33.3%	1.33	31%	22%	31%	17%	0%
Asian	**453**	36.5%	1.46	29%	24%	24%	20%	4%
Hispanic or Latino	**1,792**	25.3%	1.01	43%	26%	19%	11%	1%
Native Hawaiian or Pacific Islander	**41**	23.2%	0.93	51%	12%	29%	7%	0%
White (non-Hispanic)	**15,833**	30.5%	1.22	34%	28%	21%	15%	2%
Two or more races	**1,264**	27.3%	1.09	40%	27%	18%	13%	1%
Migrant	**87**	24.1%	0.97	47%	24%	14%	15%	0%
English Learner	**1,477**	21.5%	0.86	49%	26%	18%	8%	0%
Economically Disadvantaged	**13,493**	25.9%	1.04	42%	26%	19%	12%	1%
Students with Disabilities	**3,048**	27.1%	1.09	40%	27%	18%	13%	1%

	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

A. one thing that cindy's neighborhood could do to Protect The bees is insted of killing a bee if you see one move a way from it

B. another way is People could stop getting stung by bees because after a be stings you it dies.

Anchor Annotation, Paper 1
Score Point 0

There is no evidence that the student has any understanding of how to improve the health of honeybees. The response proposes two solutions (*insted of killing a bee if you see one move a way from it . . . stop getting stung by bees)* that are incorrect. The explanation lacks any relevant details that may improve the health of honeybees.

Two proposed solutions are you can not cut the hive and don't take the honey I know this because in the past I rememder that " If you take honey from the bees they have to make more and they wont have any thing to eat and if you cut the hive they wont have anything" This proves that if you hurt ther invierment it can hurt them.

Anchor Annotation, Paper 2
Score Point 0

There is no evidence that the student has any understanding of how to improve the health of honeybees. The response proposes two solutions (*not cut the hive and don't take the honey)* that are incorrect. The student attempts an explanation (*If you take honey from the bees they . . . wont have any thing to eat . . . cut the hive they wont have anything)* that lacks any relevant details that may improve the health of honeybees.

The best proposed soloution health local bee population is chemical spray use and lackof basic needs. Because you are tring to get read of the bees not keep them.

Anchor Annotation, Paper 3
Score Point 0

There is no evidence that the student has any understanding of how to improve the health of honeybees. The response proposes two solutions (*chemical spray use and lack of basic needs)* that are unclear and incomplete. The student attempts an explanation (*get [rid] of the bees not keep them)* that lacks any relevant details of honeybee health.

two proposed solutioun that could be done in cindys neighborhood are one is to keep planting dandalions and keep our Bee population alive.

Anchor Annotation, Paper 4
Score Point 1

There is evidence in this response that the student has minimal understanding of how to improve the health of honeybees. The response minimally addresses how to save honeybees by proposing one valid solution (*keep planting dandalions*). This is viewed as a proposed solution to plant honeybee friendly flowers which is acceptable for credit. No further explanation is provided.

One thing that cindy can do in her neighborhood to improve the Health of the local bee population is to plant more honey bee-friendly flowers, and Don't mow weeds, and wild flowers and grow a greater variety of food crops that bloom at different times of year, and provide manufactured honeybees to world food supply, and Ban or reduce use of chemical sprays.

Anchor Annotation, Paper 5
Score Point 1

There is evidence in this response that the student has minimal understanding of how to improve the health of honeybees. The response minimally addresses how to save honeybees by proposing multiple valid solutions (*plant more honey bee-friendly flowers and Don't mow weeds and wild flowers and grow a greater variety of food crops . . . ban or reduce use of chemical sprays).* No claims are provided for why these solutions would improve the health of the honey bees. By only identifying proposed solutions, this response shows minimal understanding of the concepts of the question.

I picked that the frow a greater variety of food crops that bloom at different times of year and provide manufactured honeybee hives. It is a good choice because it can help honeybees which will help honeybees survive. That is how we will improve the health of the bee population.

Anchor Annotation, Paper 6
Score Point 1

There is evidence in this response that the student has minimal understanding of how to improve the health of honeybees. The response minimally addresses how to save honeybees by proposing two valid solutions (*[grow] a greater variety of food crops . . . provide manufactured honeybee hives)*; but only one claim is made to minimally explain how the solutions will improve the health of the bee population (*it can help the honeybees which will help honeybees survive*), and does not demonstrate **how** or **why** food crops and manufactured hives may improve the health of honeybees. Claims made should explain **why** the solution chosen would improve the health of the local bee population; this response does not specify how or why these solutions would 'help honeybees,' 'help honeybees survive,' or 'improve the health of the bee population.' This response only provides a minimal understanding of how the solutions will help the bee survival.

Maybe plant more flowers because that is what they like to eat. We should plant enough flowers for every bee so they could get all the food they need. Bees need flowers.

Anchor Annotation, Paper 7
Score Point 2

There is evidence in this response that the student has a limited understanding of how to improve the health of honeybees. The response is partially complete, proposing one solution (*plant more flowers*) and providing a partially complete explanation of how that solution may improve the health of honeybees (*that is what they like to eat . . . enough flowers for every bee so they could get all the food they need*). The response reflects a clear, but limited, use of the information given in the stimulus table and the claim made begins to support **why** the solution is a good choice of something to do to improve the health of the local bee population (*so they could get all the food they need*).

Cindy's neighborhood should help the bees by having some bee keepers to feed and take care of all the bees equally cared for and have the queen cured and looked after each and every day to make sure that the queen is not hurt. Also they should plant some flowers for all the worker bees to be able to stor pollen and nectar for them to get to eat. These are a few ways Cindy's neighborhood could help the bees on their street.

Anchor Annotation, Paper 8
Score Point 2

There is evidence in this response that the student has a limited understanding of how to improve the health of honeybees. The response is partially complete, proposing one acceptable solution (*plant some flowers*) and a partially complete explanation of how that solution may improve the health of honeybees (*flowers for all the worker bees to be able to stor pollen and nectar for them to get to eat*). However, the student attempts to propose another solution that is not given in the stimulus table (*having some bee keepers*) and explanation (*to feed and take care of all the bees equally*), and although this is not a solution that is given in the stimulus table, it does reflect a limited synthesis of how to improve the health of honeybees based on the information offered in the stimulus. Overall, the student shows a limited understanding of the knowledge and skills of the question.

Cindy's neighborhood could easily educate the public about the importance of honey-bees. They could have people come to the school's and talk to the children about the importance of honeybees, which would at least have her town caring about honeybees or, have a social gathering where everyone pitches in in making a secure shelter fo honey bees. Which, would at least give her town's local bee population a secure shelter.

Anchor Annotation, Paper 9
Score Point 2

There is evidence in this response that the student has a limited understanding of how to improve the health of honeybees. The response is partially complete, proposing two acceptable solutions (*educate the public about the importance of honeybees . . . making a secure shelter)* with partially complete explanations of how these solutions may improve the health of honeybees (*would at least have her town caring about honeybees . . . give her town's local bee population a secure shelter).* The claims made are integrated together; however, the student's reference to manufacturing hives is somewhat unclear and the explanation for this solution is redundant and lacks detail. This reflects a limited synthesis of how to improve the health of honeybees based on the information offered in the stimulus.

Proposed solutions

1) Plant more honeybee friendly flowers

2) Don't mow weeds and wild flowers.

Planting more honeybee friendly flowers could provide the bees with more food to take back to the hive.

Also if people would not mow the wildflower, then the bees wouldn't have to go looking for food.

Anchor Annotation, Paper 10
Score Point 3

There is evidence in this response that the student has a general understanding of how to improve the health of honeybees. The response is generally complete and provides two related solutions given in the stimulus table (*plant more honeybee friendly flowers . . . don't mow weeds and wildflowers*). The claims made provide a clear, accurate summary of the information given in the stimulus table (*provide the bees with more food to take back to the hive . . . not mow the wild flower, then the bees wouldn't have to go looking for food*), but no additional synthesis of the concepts given in the stimulus table is provided. This response demonstrates a general understanding of the question.

Note: For the top score point, students will go beyond the information presented in the table and integrate a complete synthesis of the concepts presented.

One thing that can be fixed is lack of human understanding. Cindy's neighborhood should educate the public about the importance of honey bees in the world. One benefit is that informed people can make better choices. A negitaveity is that people can choose not to act on the information. The second thing is chemical spray use. Ban or reduce use of some chemical sprays. A benefit is les posionouse substances to harm honey bees will not be sprayed. But a negitaveity is insects may damage more food crops.

Anchor Annotation, Paper 11
Score Point 3

There is evidence in this response that the student has a general understanding of how to improve the health of honeybees. The response is generally complete and provides two solutions given in the stimulus table *(should educate the public about the importance of honeybees . . . ban or reduce use of some chemical sprays*). The claims made provide a clear, accurate summary of the information given in the stimulus table (*informed people can make better choices . . . les posionouse substances to harm honey bees*), but additional synthesis of ideas expressed in the stimulus table is not provided. The response provides two solutions with two claims that provide generally complete explanations for why the solution will improve the health of the bee population. No flaws are present, but additional elaboration and specific details, outside of what is given in the stimulus table, are needed to earn a higher score. Note that the student identifies possible negative points of the proposed solutions which do not contribute to or detract from the overall understanding demonstrated.

First, educate the public about the importance of honey bees to the world food supply. People will cut grass less and grow more flowers for the bees. This will save the bees and keep most of them alive.

Second, grow a greater variety of food crops that bloom at different times of the year. That will help the bees get more food throughout spring for nectar, fall for nectar summer for nectar and winter, they could store all their nectar in the hive.

Anchor Annotation, Paper 12
Score Point 3

There is evidence in this response that the student has a general understanding of how to improve the health of honeybees. The response is generally complete with two solutions provided *(educate the public about the importance of honey bees . . . grow a greater variety of food crops)* and reflects a general synthesis of information, tying education of the public with people starting to do more bee friendly practices (*People will cut grass less and grow more flowers for the bees*), but does not provide the higher level synthesis and details when explaining why these measures will help (*This will save the bees and keep most of them alive*). The claim for the second solution provides some additional details of why this solution would improve the health of bees (*a greater variety of food crops that bloom at different times of the year. That will help the bees get more food throughout spring for nectar, fall for nectar, summer for nectar and winter, they could store all their nectar in the hive*). Overall, the response provides a strong general understanding of the question as evidenced by the explanations of why these solutions will help the bees heath and survival. Additional elaboration and synthesis of the benefits of the proposed solutions would help this response move into a higher scorepoint.

One solution that I chose is don't mow wees and wild flowers. Bees get nectar from the weeds and wild flowers so they can make honey and feed themselves. They have to have food just like we do. My second reason is grow a greater variety of food crops that bloom at different times of a year. Why I chose that one is because, food crops aren't flowers and weeds and stuff like that, but they do carry nectar and pollon. They need to grow at different types of the year because, bees need food all throughout the year like we do so thats why I chose those two reasons.

Anchor Annotation, Paper 13
Score Point 4

There is evidence in this response that the student has a complete and thorough understanding of how to improve the health of honeybees. The response is complete, thorough, and correct with two solutions provided (*don't mow [weeds] and wild flowers . . . grow a greater variety of food crops*) and reflects a complete synthesis of how to improve the health of honeybees (*Bees get nectar from the weeds and wild flowers so they can make honey and feed themselves. They have to have food just like we do . . . grow a greater variety of food crops that bloom at different time of a year. . . chose that one is because, food crops aren't flowers and weeds. . . but they do carry nectar and pollon. They need to grow at different types of the year because, bees need food all throughout the year like we do*). The synthesis of student thought that is integrated into the explanation, such as connecting that bees need food year round as we do, helps this response move into the score point 4. The explanations provided for why each solution is a good choice to improve the health of the bees goes beyond the information given in the stimulus table, and gives accurate interpretations of the benefits. Every detail adds to the explanation, showing not just how, but why, the solutions may improve the health of honeybees. This response demonstrates a thorough understanding.

Chemical spray being banned is a good idea because we need bees. Some people may not like bees because they dont know how much we need them. If we ban chemical sprays on bees then it is less poisonous substances to hurt honey bees. That way more of them can populate.

In the Lack of basic needs section not planting more honeybee friendly flowers is a good idea. When you plant more friendly flowers it gives bees more food. So that way they have more to bring back to the hive. Also if you do not mow weeds and wild flowers then it also provides more food. It also has no cost.

In the lack of human understanding section educating people about bees is a good idea. If you inform people about what bees do they may make better choices about hurting bees. They also may pass down information and then lots of people will understand why we need bees. They will stop killing bees and may start helping them.

Anchor Annotation, Paper 14
Score Point 4

There is evidence in this response that the student has a complete and thorough understanding of how to improve the health of honeybees. The response is complete, thorough, and correct with several solutions provided (*ban chemical sprays on bees . . . plant more friendly flowers . . . do not mow weeds and wild flowers . . . inform people about what bees do*) and reflects a complete synthesis of how to improve the health of honeybees (*it is less poisonous substances to hurt honey bees. That way more of them can populate . . . it gives bees more food . . . they have more to bring back to the hive . . it also provides more food . . . they may make better choices . . . pass down information and then lots of people will understand why we need bees . . . stop killing bees and may start helping them*). Synthesis of student thought is integrated into the explanation, such as connecting an increase in bee survival rate to population growth and explaining how information can be spread through a public education campaign. The explanations provided for why each solution is a good choice to improve the health of the bees goes beyond the information given in the stimulus table, and gives accurate interpretations of the benefits. Details add to the explanation, showing not just how, but why, the solutions may improve the health of honeybees. Compare the last paragraph here to Anchor Paper 11: both responses link an informed population to making better choices, but in this response the process is specified “They also may pass down information and then lots of people will understand why we need bees.” This response demonstrates a thorough understanding.

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