

Content Domain	Main Topic	Cognitive Domain
ENVIRONMENTAL SCIENCE	Use and Conservation of Natural Resources	Reasoning and Analysis

Positive/negative effect of dam

The diagram shows a farm in a valley where a dam has just been built.

The presence of the dam can have both positive and negative effects on farming in the valley.

A. Describe one positive effect of the dam on farming.

B. Describe one negative effect of the dam on farming.

Item Number: S022088B

Overall Percent Correct

Chinese Taipei	68	▲
Slovak Republic	64	▲
Netherlands	63	▲
Romania	62	▲
Estonia	61	▲
United States	59	▲
Belgium (Flemish)	57	▲
Latvia	57	▲
Hong Kong, SAR	57	▲
Israel	56	▲
New Zealand	55	▲
Slovenia	55	▲
Jordan	55	▲
Russian Federation	54	▲
Indonesia	53	▲
Norway	52	▲
Australia	51	▲
Iran, Islamic Republic of	50	▲
Bulgaria	50	▲
Lithuania	49	▲
Singapore	46	○
England	46	○
Malaysia	45	○
Bahrain	44	○
Italy	44	○
<b>International average</b>	<b>44</b>	
Korea, Republic of	41	○
Palestinian Nat'l Auth.	40	▼
Armenia	39	▼
Scotland	38	▼
Japan	38	▼
Macedonia, Republic of	38	▼
Sweden	38	▼
Philippines	37	▼
Hungary	37	▼
Saudi Arabia	35	▼
Tunisia	35	▼
Moldova, Rep. of	35	▼
Serbia and Montenegro	32	▼
Chile	30	▼
Cyprus	29	▼
Egypt	26	▼
Lebanon	24	▼
Morocco	21	▼
Botswana	19	▼
Ghana	13	▼
South Africa	11	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

## Positive/negative effect of dam (continued)

Item Number: S022088B

### SCORING

#### Codes for Negative Effects

Note: For credit, responses must clearly indicate a negative effect of the dam related to farming in the valley.

#### Correct Response

- Mentions the dam breaking (resulting in flooding).  
*Examples: If the dam breaks it could flood the valley and the crops.*  
*If there is a leak, the whole dam could flood and destroy everything.*
- Mentions the river drying up or decreasing water supply.  
*Examples: No or less irrigation because the dam does not let the water flow through.*  
*The fields could dry out from too little water.*  
*It slows the river too much and the farm will not have enough water.*
- Mentions a soil-related problem of the dam.  
*Examples: Nutrients not replenished by flooding.*  
*The rich nutrients from the water are not coming over the fields.*
- Mentions upsetting the ecological balance.  
*Examples: The dam could alter the ecology of the farm.*  
*The dam might interfere with the farm's ecosystem.*
- Other correct.

#### Incorrect Response

- Mentions a negative effect but it does not clearly address the issue of farming or the effect of the dam.  
*Examples: It bursts.*  
*It is now going to be a tourist attraction.*  
*Flooding. [Does not mention how the dam causes this.]*  
*A lot of fish will die because their habitat has been changed.*  
*The fish cannot swim upstream.*
- Response indicates a misconception of how dams function (controlled release of water).  
*Examples: The lake could overflow the top of the dam.*
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task).

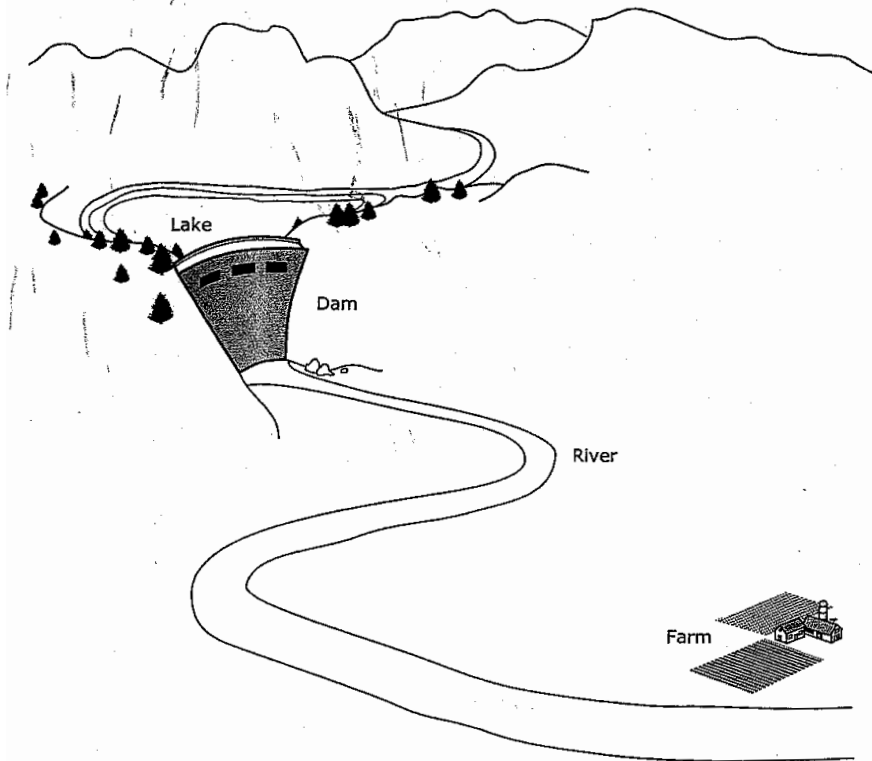
Positive/negative effect of dam (continued)

Item Number: S022088B

Student Responses

Correct Response:

The diagram shows a farm in a valley where a dam has just been built.



The presence of the dam can have both positive and negative effects on farming in the valley.

B. Describe one negative effect of the dam on farming.

If would slow down the water pressur and the minirals from up the river wouldn't be eroded to give the farm soil minirals,

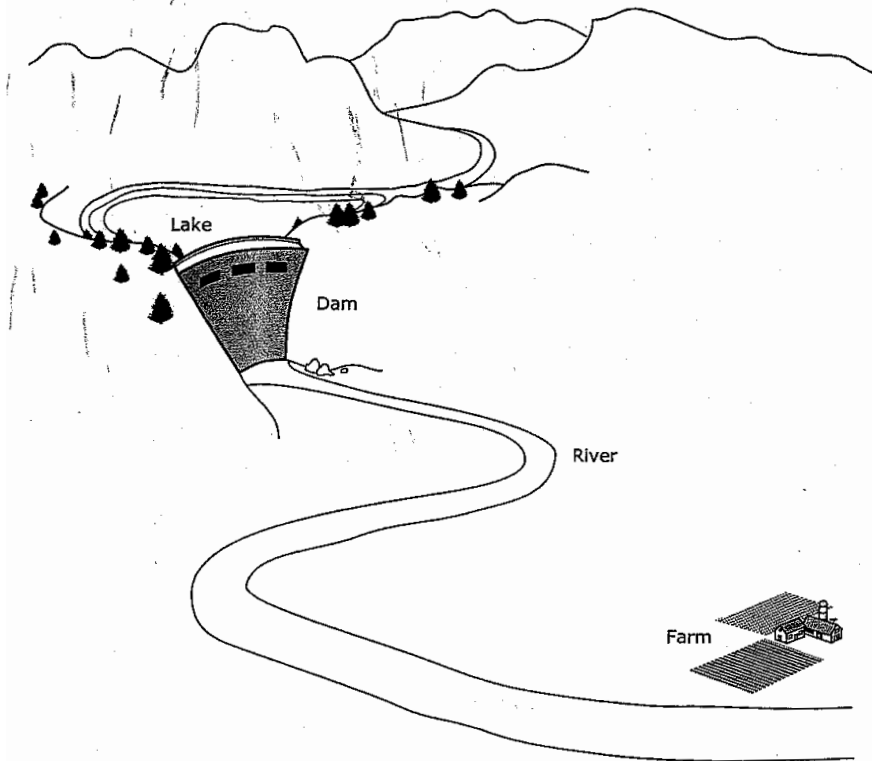
Positive/negative effect of dam (continued)

Item Number: S022088B

Student Responses (continued)

Incorrect Response:

The diagram shows a farm in a valley where a dam has just been built.



The presence of the dam can have both positive and negative effects on farming in the valley.

B. Describe one negative effect of the dam on farming.

It disturbs the nature of the farming and could drought.

Content Domain	Main Topic	Cognitive Domain
ENVIRONMENTAL SCIENCE	Use and Conservation of Natural Resources	Reasoning and Analysis

### Drinking water from sea water

Sea water contains dissolved salts and is not suitable for drinking. Describe a procedure that can be used to obtain a cup of drinking water from a bucket of sea water.

Item Number: S032063

### SCORING

Note: For full credit, responses must give a procedure that clearly indicates the method used to separate water from salt and collect the pure water. The most common procedure is the distillation method, but other correct procedures such as the freezing method or reverse osmosis method are possible. Partial credit should be given for responses that address at least the separation portion of the procedure. Responses that are based on boiling or filtering without indicating how separation of water and salt occurs are scored as incorrect.

#### Correct Response

- Describes a correct procedure that includes the following basic steps (may use diagrams):
  - Boiling/evaporation to separate water from salt
  - Collecting the distilled water (condensation)

*Examples: Heat the salt water, catch the steam on a tray, drip it into a cup and the salt will be left in the bucket and drinking water in the cup.*

*Boil the sea water taking the steam up to a tube and letting steam turn back into water.*

- Other fully correct.

#### Partially Correct Response

Describes boiling/evaporation step to separate water from salt; condensation step is omitted.

*Examples: Maybe if you boiled the salt water the salt would separate from the water.*

*Take the salt water and boil it and the steam will create great drinking water.*

- States 'distillation' or similar but no description of the process is given.

*Examples: The best way is to use a distillation apparatus.*

*Distill it.*

- Other partially correct.

#### Incorrect Response

- Mentions boiling but with no or incorrect indication of separation included. [May also mention filtering or other processes.]

*Examples: You can boil it.*

- Mentions filtering to separate salt. [Response not based on boiling.]

*Examples: Make it go through a filter.*

- Other incorrect (including crossed out/erased, stray marks, illegible or off task).

### Overall Percent Correct

Singapore	35	▲
Korea, Republic of	22	▲
Estonia	21	▲
Hong Kong, SAR	20	▲
Egypt	20	▲
Japan	19	▲
New Zealand	16	▲
Netherlands	15	▲
Australia	15	▲
England	14	▲
Jordan	13	▲
Iran, Islamic Republic of	12	▲
Lithuania	12	○
Latvia	11	○
Russian Federation	11	○
Slovak Republic	11	○
Israel	11	○
Scotland	10	○
Hungary	10	○
Palestinian Nat'l Auth.	10	○
Bahrain	10	○
Sweden	10	○

International average	10	
Armenia	9	○
Slovenia	8	○
Norway	8	○
Chinese Taipei	7	▼
Italy	7	▼
Macedonia, Republic of	7	▼
Saudi Arabia	7	○
United States	6	▼
Bulgaria	6	▼
Morocco	6	▼
Cyprus	5	▼
Romania	5	▼
Malaysia	5	▼
Belgium (Flemish)	4	▼
Lebanon	3	▼
South Africa	3	▼
Chile	3	▼
Serbia and Montenegro	3	▼
Tunisia	2	▼
Ghana	2	▼
Indonesia	2	▼
Philippines	1	▼
Botswana	1	▼
Moldova, Rep. of	0	▼

#### Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

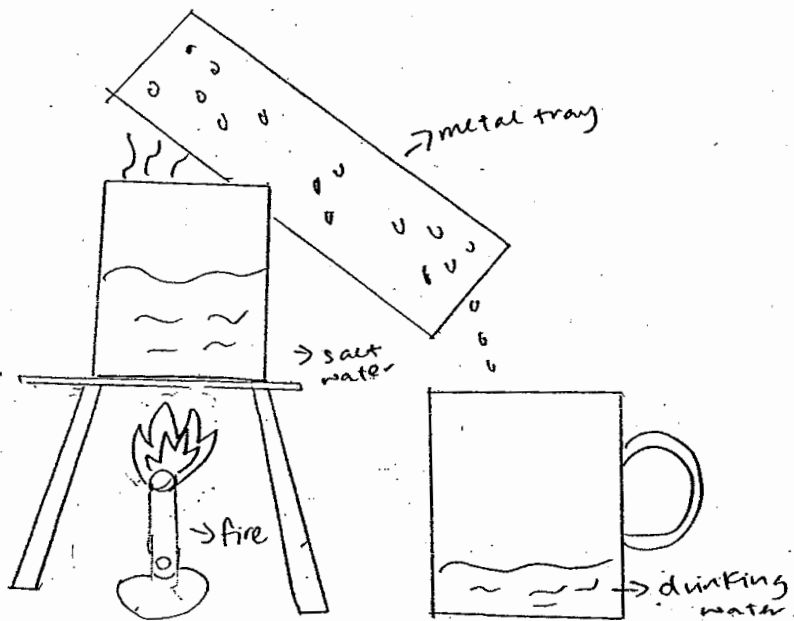
## Drinking water from sea water (continued)

Item Number: S032063

## Student Responses

## Correct Response:

Sea water contains dissolved salts and is not suitable for drinking.  
Describe a procedure that can be used to obtain a cup of drinking water from a bucket of sea water.



## Partially Correct Response:

Sea water contains dissolved salts and is not suitable for drinking.  
Describe a procedure that can be used to obtain a cup of drinking water from a bucket of sea water.

put gladwrap over the bucket  
and wait for the <sup>water</sup> salt to  
evaporate, onto the lunchwrap.

Drinking water from sea water (continued)

Item Number: S032063

**Student Responses** (continued)

**Incorrect Response:**

Sea water contains dissolved salts and is not suitable for drinking.  
Describe a procedure that can be used to obtain a cup of drinking water  
from a bucket of sea water.

We take the sea water and we try to remove  
the salts until the water don't have  
any salts then we use fresh water  
and put it together with the sea water.

Content Domain	Main Topic	Cognitive Domain
LIFE SCIENCE	Cells and Their Functions	Factual Knowledge

## Main function of red blood cells

What is the main function of red blood cells?

- (A) To fight disease in the body
- (B) To carry oxygen to all parts of the body
- (C) To remove carbon monoxide from all parts of the body
- (D) To produce materials which cause the blood to clot

Item Number: S012038

Correct Response:

**B**

## Overall Percent Correct

Singapore	90	▲
England	84	▲
Japan	84	▲
Italy	82	▲
Chinese Taipei	81	▲
Malaysia	77	▲
United States	75	▲
Sweden	75	▲
Australia	74	▲
Netherlands	73	▲
Scotland	70	▲
New Zealand	69	▲
Slovak Republic	69	▲
Hungary	66	▲
Lebanon	66	▲
Indonesia	64	▲
Jordan	64	○
Korea, Republic of	62	○
Israel	61	○
Belgium (Flemish)	60	○
Slovenia	60	○
<b>International average</b>	<b>60</b>	
Hong Kong, SAR	59	○
Norway	58	○
Armenia	57	○
Morocco	56	○
Saudi Arabia	56	○
Tunisia	54	▼
Lithuania	54	▼
Bahrain	53	▼
Philippines	53	▼
Estonia	53	▼
Serbia and Montenegro	53	▼
Bulgaria	52	▼
Russian Federation	52	▼
Macedonia, Republic of	52	▼
Cyprus	50	▼
Palestinian Nat'l Auth.	50	▼
Iran, Islamic Republic of	49	▼
Romania	48	▼
Botswana	46	▼
Egypt	45	▼
Moldova, Rep. of	39	▼
Latvia	39	▼
Ghana	36	▼
South Africa	34	▼
Chile	33	▼

## Country average vs. International average:

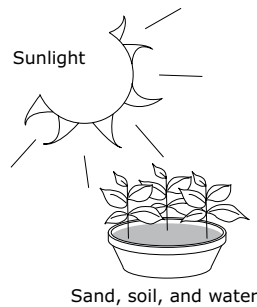
Higher	▲
Not different	○
Lower	▼



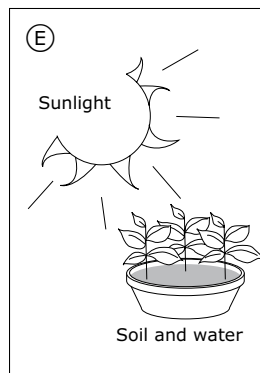
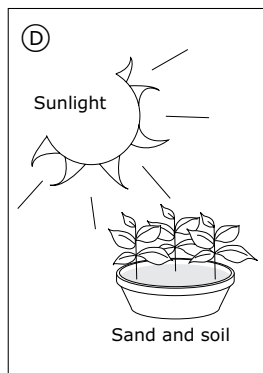
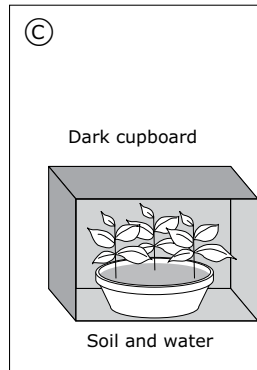
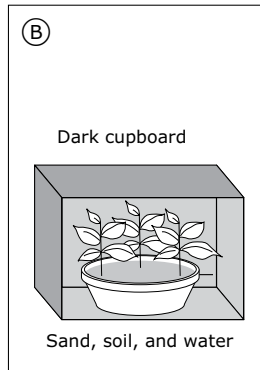
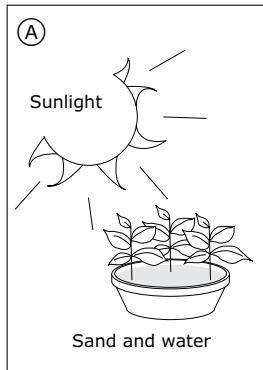
Content Domain	Main Topic	Cognitive Domain
LIFE SCIENCE	Development and Life Cycle of Organisms	Reasoning and Analysis

Plant growth experiment

A girl has an idea that green plants need sand in the soil for healthy growth. In order to test her idea she uses two pots of plants. She sets up one pot of plants as shown below.



Which ONE of the following should she use for the second pot of plants?



Item Number: S022235

Overall Percent Correct

Sweden	81	▲
Hungary	76	▲
Hong Kong, SAR	76	▲
Singapore	76	▲
Japan	74	▲
Armenia	73	▲
Estonia	72	▲
Chinese Taipei	72	▲
Norway	72	▲
United States	70	▲
Moldova, Rep. of	68	▲
Romania	67	▲
Australia	67	▲
Scotland	66	▲
Jordan	65	▲
Bulgaria	65	▲
England	65	▲
Russian Federation	65	▲
Italy	64	▲
Chile	64	▲
Israel	63	▲
Saudi Arabia	62	○
New Zealand	62	○
Serbia and Montenegro	62	○
Korea, Republic of	60	○
Netherlands	60	○
Bahrain	60	○
<b>International average</b>	<b>59</b>	
Palestinian Nat'l Auth.	58	○
Slovenia	57	○
Slovak Republic	57	○
Lithuania	57	○
Cyprus	56	○
Egypt	55	○
Malaysia	55	○
Morocco	47	▼
Philippines	44	▼
Botswana	44	▼
Lebanon	42	▼
Tunisia	41	▼
Indonesia	39	▼
Latvia	39	▼
Belgium (Flemish)	36	▼
South Africa	34	▼
Ghana	29	▼
Iran, Islamic Republic of	14	▼
Macedonia, Republic of	0	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Correct Response:

E

Content Domain	Main Topic	Cognitive Domain
LIFE SCIENCE	Diversity, Adaptation, and Natural Selection	Conceptual Understanding

## Fossils in sedimentary rock

The fossils that are found in the oldest layers of sedimentary rock were formed from which types of organisms?

- (A) only organisms that lived in the sea
- (B) only organisms that lived on land
- (C) only organisms that lived in the air
- (D) organisms that lived on the land, in the sea and in the air

Item Number: S032083

Correct Response:

A

## Overall Percent Correct

Japan	79	▲
Korea, Republic of	63	▲
Slovenia	55	▲
Sweden	53	▲
Hungary	49	▲
Hong Kong, SAR	47	▲
Slovak Republic	45	▲
Bulgaria	41	▲
Italy	37	▲
Iran, Islamic Republic of	35	▲
Norway	34	▲
Malaysia	33	▲
Netherlands	32	○
Chinese Taipei	32	▲
Israel	31	○
England	30	○
United States	29	○
Serbia and Montenegro	28	○
<b>International average</b>	<b>28</b>	
Lithuania	27	○
Scotland	27	○
Estonia	27	○
Morocco	26	○
Australia	25	○
Belgium (Flemish)	25	▼
Russian Federation	24	▼
Singapore	24	▼
Romania	23	▼
New Zealand	20	▼
Cyprus	19	▼
Moldova, Rep. of	19	▼
Armenia	19	▼
Botswana	17	▼
Lebanon	17	▼
Latvia	17	▼
Egypt	17	▼
Macedonia, Republic of	16	▼
Philippines	15	▼
Bahrain	14	▼
Tunisia	12	▼
Saudi Arabia	12	▼
South Africa	11	▼
Chile	11	▼
Indonesia	10	▼
Ghana	8	▼
Palestinian Nat'l Auth.	0	▼
Jordan	0	▼


## Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Content Domain	Main Topic	Cognitive Domain
A. LIFE SCIENCE	Diversity, Adaptation and Natural Selection	Reasoning and Analysis
B. LIFE SCIENCE	Structure, Function and Life Processes in Organisms	Conceptual Understanding

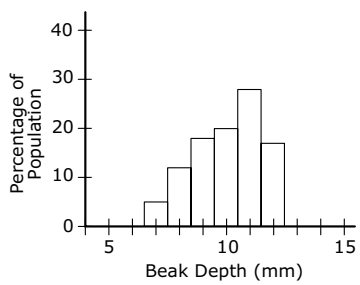
Galapagos Islands: compare beak depths of Species 1 and 2

The Galapagos Islands contain a number of different species of finches (birds) that are thought to have developed from one species. Some species of finches eat certain types of seeds depending on their beak depth. The diagram below shows the head of one species of finch and its beak depth.

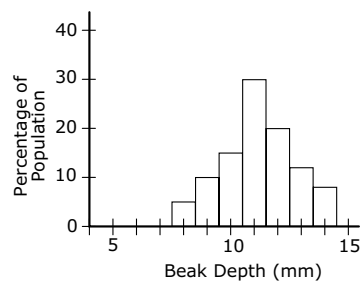


Some of the islands have only one species living on them, while other islands have more than one species. Species 1 lives on Los Hermanos Island. Species 2 lives on Daphne Island. The two graphs below show the percentage of the population with different beak depths for each of the two species.

Species 1 on Los Hermanos



Species 2 on Daphne



A. How do the beak depths of Species 1 and Species 2 compare?

B. A wide variety of seeds exist on the islands, and both Species 1 and Species 2 eat seeds. Based on the beak depths of the two finch species, what would you conclude about the size of seeds that each species eats?

Item Number: S032706A

Overall Percent Correct

Japan	66	▲
Korea, Republic of	65	▲
Slovenia	56	▲
Belgium (Flemish)	55	▲
Hong Kong, SAR	54	▲
Malaysia	46	▲
Chinese Taipei	46	▲
Singapore	46	▲
United States	45	▲
Latvia	45	▲
Russian Federation	44	▲
New Zealand	43	▲
Estonia	42	▲
Hungary	42	▲
Armenia	41	▲
Australia	41	▲
Sweden	39	▲
Scotland	39	▲
England	39	▲
Lithuania	36	▲
Italy	35	○
Netherlands	34	○
Norway	31	○
<b>International average</b>	<b>30</b>	
Romania	29	○
Chile	26	○
Moldova, Rep. of	26	○
Slovak Republic	23	▼
Indonesia	22	▼
Bulgaria	21	▼
Egypt	21	▼
Israel	19	▼
Jordan	19	▼
Iran, Islamic Republic of	18	▼
Macedonia, Republic of	17	▼
Cyprus	17	▼
Morocco	16	▼
Bahrain	14	▼
Serbia and Montenegro	13	▼
Palestinian Nat'l Auth.	12	▼
Tunisia	10	▼
South Africa	6	▼
Saudi Arabia	6	▼
Philippines	4	▼
Botswana	4	▼
Ghana	3	▼
Lebanon	3	▼

Country average vs. International average:	
Higher	▲
Not different	○
Lower	▼

## Galapagos Islands: compare beak depths of Species 1 and 2 (continued)

Item Number: S032706A

**SCORING**

Note: Credit will be given for responses that are consistent with the information in the graphs. This includes responses that are based on similarities, differences, or both. Responses that indicate that the two species are 'similar' must refer to specific information from the graphs, such as the range, average, most frequent beak size (mode), etc., in order to receive credit. Responses that state only that the two species are the 'same' or 'similar' with no supporting information are incorrect.

**Correct Response**

- Gives a description based on **similarities** that is supported with information in the graphs.  
*Examples: Both are similar in average beak size.*  
*They are similar because they both have most finches in the 11mm beak range.*
- Gives description based on **differences** that is supported with information in the graphs.  
*Examples: Species 1 is a little bit shorter than Species 2.*  
*Species 2 has more that are big.*  
*Species 2 has a wider range of depth than of Species 1.*
- Give a description that includes **both** similarities and differences.  
*Examples: Both species have the greatest amount of birds with 11mm beak depths, but Species 1 does not have birds with beak depths bigger than 13mm.*
- Other correct.

**Incorrect Response**

- States only that the two species are the 'same' or 'similar' without supporting information from the graphs.  
*Examples: They are nearly the same.*
- States that one species is larger or smaller than the other, but does not identify which.  
*Examples: One of them is a bit different on beak depth.*
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task).

## Galapagos Islands: compare beak depths of Species 1 and 2 (continued)

Item Number: S032706A

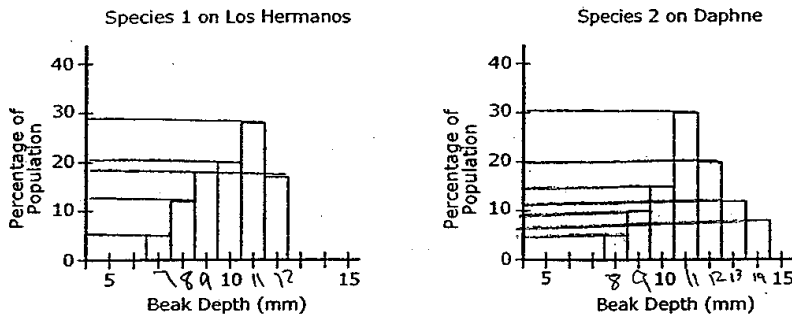
## Student Responses

## Correct Response:

The Galapagos Islands contain a number of different species of finches (birds) that are thought to have developed from one species. Some species of finches eat certain types of seeds depending on their beak depth. The diagram below shows the head of one species of finch and its beak depth.



Some of the islands have only one species living on them, while other islands have more than one species. Species 1 lives on Los Hermanos Island. Species 2 lives on Daphne Island. The two graphs below show the percentage of the population with different beak depths for each of the two species.



A. How do the beak depths of Species 1 and Species 2 compare?

Species 2 birds have deeper beaks, and very few birds with beaks under 10mm. Species 1 birds generally have smaller beaks.

## Galapagos Islands: compare beak depths of Species 1 and 2 (continued)

Item Number: S032706A

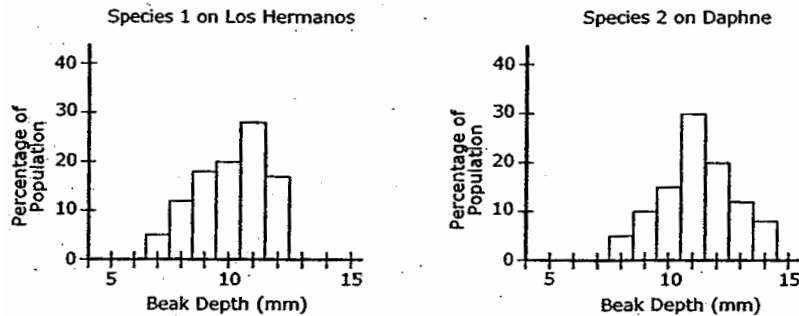
## Student Responses (continued)

## Incorrect Response:

The Galapagos Islands contain a number of different species of finches (birds) that are thought to have developed from one species. Some species of finches eat certain types of seeds depending on their beak depth. The diagram below shows the head of one species of finch and its beak depth.



Some of the islands have only one species living on them, while other islands have more than one species. Species 1 lives on Los Hermanos Island. Species 2 lives on Daphne Island. The two graphs below show the percentage of the population with different beak depths for each of the two species.




A. How do the beak depths of Species 1 and Species 2 compare?

The beak depth is pretty close in graph 1 and 2

Content Domain	Main Topic	Cognitive Domain
A. LIFE SCIENCE	Diversity, Adaptation and Natural Selection	Reasoning and Analysis
B. LIFE SCIENCE	Structure, Function and Life Processes in Organisms	Conceptual Understanding

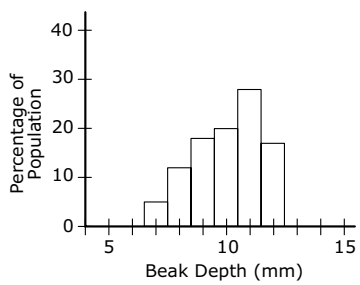
Galapagos Islands: size of seeds each species eats

The Galapagos Islands contain a number of different species of finches (birds) that are thought to have developed from one species. Some species of finches eat certain types of seeds depending on their beak depth. The diagram below shows the head of one species of finch and its beak depth.

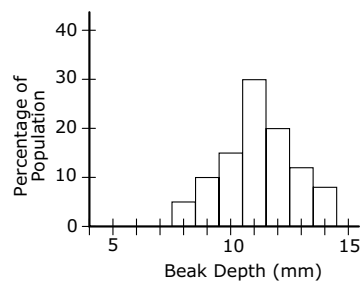


Some of the islands have only one species living on them, while other islands have more than one species. Species 1 lives on Los Hermanos Island. Species 2 lives on Daphne Island. The two graphs below show the percentage of the population with different beak depths for each of the two species.

Species 1 on Los Hermanos



Species 2 on Daphne



A. How do the beak depths of Species 1 and Species 2 compare?

B. A wide variety of seeds exist on the islands, and both Species 1 and Species 2 eat seeds. Based on the beak depths of the two finch species, what would you conclude about the size of seeds that each species eats?

Item Number: S032706B

Overall Percent Correct

Korea, Republic of	59	▲
Japan	51	▲
Estonia	51	▲
Belgium (Flemish)	48	▲
Chinese Taipei	47	▲
Latvia	45	▲
Hong Kong, SAR	45	▲
Singapore	45	▲
England	42	▲
Slovenia	42	▲
Armenia	42	▲
United States	40	▲
Lithuania	39	▲
Malaysia	39	▲
Hungary	37	▲
Netherlands	36	▲
Scotland	34	▲
Australia	33	○
Russian Federation	32	○
New Zealand	32	○
Slovak Republic	31	○
Sweden	29	○
Norway	29	○
Italy	27	○
<b>International average</b>	<b>27</b>	
Moldova, Rep. of	26	○
Romania	25	○
Jordan	21	▼
Chile	20	▼
Bahrain	18	▼
Israel	17	▼
Cyprus	15	▼
Egypt	15	▼
Bulgaria	15	▼
Palestinian Nat'l Auth.	14	▼
Macedonia, Republic of	14	▼
Iran, Islamic Republic of	12	▼
Indonesia	12	▼
Tunisia	10	▼
Serbia and Montenegro	10	▼
Morocco	8	▼
Lebanon	7	▼
Botswana	6	▼
Saudi Arabia	4	▼
South Africa	4	▼
Philippines	2	▼
Ghana	1	▼

Country average vs. International average:	
Higher	▲
Not different	○
Lower	▼

## Galapagos Islands: size of seeds each species eats (continued)

Item Number: S032706B

### SCORING

Note: The response to Part B must be consistent with the comparison of beak sizes given in Part A in order to receive credit. Correct responses can refer explicitly to comparisons of the two "species" or more generally to a comparison of "birds" of different sizes within or across species. It is possible that a correct conclusion may be drawn based on an incorrect response to Part A.

#### Correct Response

- States that the two species eat the same (similar) types of seeds.  
[Response to A indicates that the two species have the same or similar size beaks.]
- States that Species 2 eats larger seeds than Species 1.  
[Response to A indicates that Species 2 is larger.]
- States only that birds (finches) with larger beaks eat larger seeds (or similar).  
[No explicit comparison of the two species.]
- Other correct.

#### Incorrect Response

- States that the two species eat the same (similar) types of seeds, but this conclusion is inconsistent with the response given in Part A.
- States that one species eats larger seeds than the other, but this conclusion is inconsistent with the response given in Part A.
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task).



## Galapagos Islands: size of seeds each species eats (continued)

Item Number: S032706B

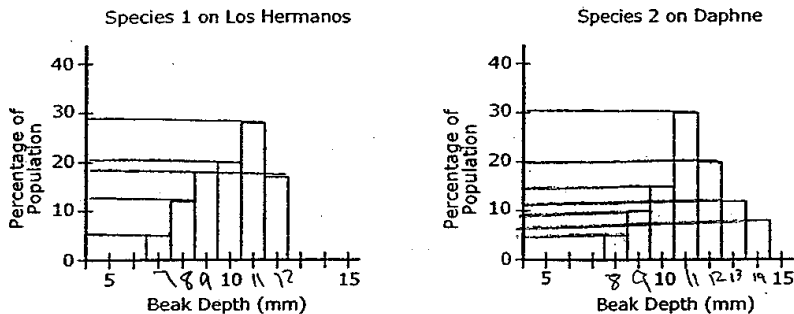
## Student Responses

## Correct Response:

The Galapagos Islands contain a number of different species of finches (birds) that are thought to have developed from one species. Some species of finches eat certain types of seeds depending on their beak depth. The diagram below shows the head of one species of finch and its beak depth.



Some of the islands have only one species living on them, while other islands have more than one species. Species 1 lives on Los Hermanos Island. Species 2 lives on Daphne Island. The two graphs below show the percentage of the population with different beak depths for each of the two species.



- B. A wide variety of seeds exist on the islands, and both Species 1 and Species 2 eat seeds. Based on the beak depths of the two finch species, what would you conclude about the size of seeds that each species eats?

Species 1 would eat the smaller seeds, because they are smaller birds. Species 2 would likely eat larger seeds.

## Galapagos Islands: size of seeds each species eats (continued)

Item Number: S032706B

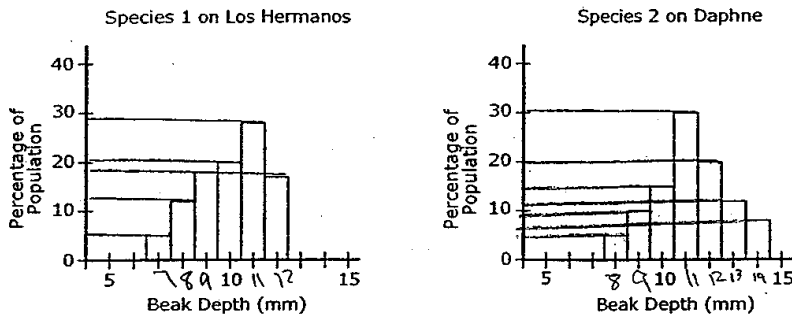
## Student Responses (continued)

## Incorrect Response:

The Galapagos Islands contain a number of different species of finches (birds) that are thought to have developed from one species. Some species of finches eat certain types of seeds depending on their beak depth. The diagram below shows the head of one species of finch and its beak depth.



Some of the islands have only one species living on them, while other islands have more than one species. Species 1 lives on Los Hermanos Island. Species 2 lives on Daphne Island. The two graphs below show the percentage of the population with different beak depths for each of the two species.



- B. A wide variety of seeds exist on the islands, and both Species 1 and Species 2 eat seeds. Based on the beak depths of the two finch species, what would you conclude about the size of seeds that each species eats?

I will check in each species 1 and 2 how much they eat each day.

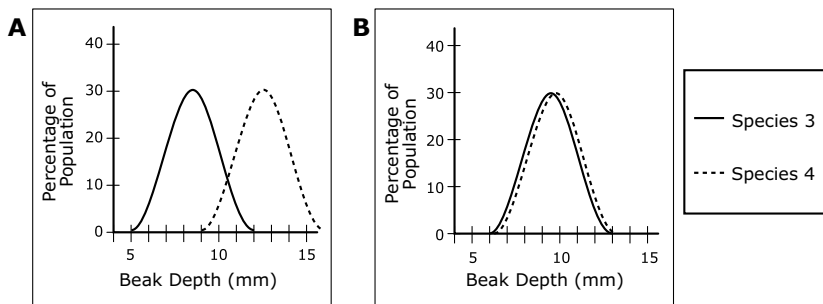
Content Domain	Main Topic	Cognitive Domain
LIFE SCIENCE	Diversity, Adaptation and Natural Selection	Reasoning and Analysis

Galapagos Islands: graphs of beak depths for Species 3 and 4

Two other species (Species 3 and Species 4) live on Santa Maria Island, which also has a range of seed types.

Which of the following graphs shows a range of beak depths for Species 3 and Species 4 that would best insure the survival of both species on Santa Maria Island?

(Circle the letter by the correct graph.)



Explain why this range of beak depths would be best.

Item Number: S032707

SCORING

Correct Response

Note: For credit, responses must identify A with an explanation based on reduced competition for food as a result of beak size differences. Credit is NOT given for responses that identify A with a minimal explanation that indicates a correct interpretation of the graph but refers only to differences in beak size.

Correct Response

- A with an explanation that relates the difference in beak size to reduced competition (or similar).  
*Examples: With the different sized beaks they would not have to share food.  
 One species will eat the small seeds and one will eat the large seeds.  
 There would be no competition between the two species if they ate different seeds.  
 They each have their own food source.*
- Other correct.

Incorrect Response

- A with a minimal explanation that refers only to the difference in beak size. [Does not explicitly mention competition for seeds or similar.]  
*Examples: Because they are different sizes.  
 Because Species 3 has a smaller beak size.*
- A with no explanation or an incorrect explanation.  
*Examples: Because their beaks look sharper.  
 Because both species have a large beak to the percentage of population.  
 It's like the other graphs.*
- B with no explanation or an incorrect explanation.  
*Examples: Bigger beak depths so they could eat more seeds.  
 Both are nearly equal and are a more normal size.  
 It's better if they are the same size because they eat the same seeds.*
- Other incorrect (including crossed out/erased, stray marks, illegible or off task).

Overall Percent Correct

Singapore	37	▲
Chinese Taipei	36	▲
Korea, Republic of	26	▲
Hong Kong, SAR	26	▲
Scotland	26	▲
Estonia	25	▲
Australia	25	▲
Sweden	23	▲
United States	23	▲
New Zealand	22	▲
Belgium (Flemish)	21	▲
Lithuania	21	▲
England	21	▲
Norway	15	▲
Slovenia	14	○
Japan	13	○
Slovak Republic	12	○
Latvia	12	○
Italy	11	○

International average 11

Russian Federation	9	○
Netherlands	9	○
Hungary	8	○
Israel	8	▼
Romania	8	○
Malaysia	4	▼
Chile	4	▼
Serbia and Montenegro	4	▼
Palestinian Nat'l Auth.	3	▼
Jordan	3	▼
Bulgaria	3	▼
Bahrain	2	▼
South Africa	2	▼
Egypt	2	▼
Armenia	2	▼
Moldova, Rep. of	2	▼
Macedonia, Republic of	2	▼
Indonesia	1	▼
Philippines	1	▼
Botswana	1	▼
Iran, Islamic Republic of	1	▼
Morocco	1	▼
Lebanon	1	▼
Cyprus	1	▼
Saudi Arabia	1	▼
Tunisia	1	▼
Ghana	1	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

## Galapagos Islands: graphs of beak depths for Species 3 and 4 (continued)

Item Number: S032707

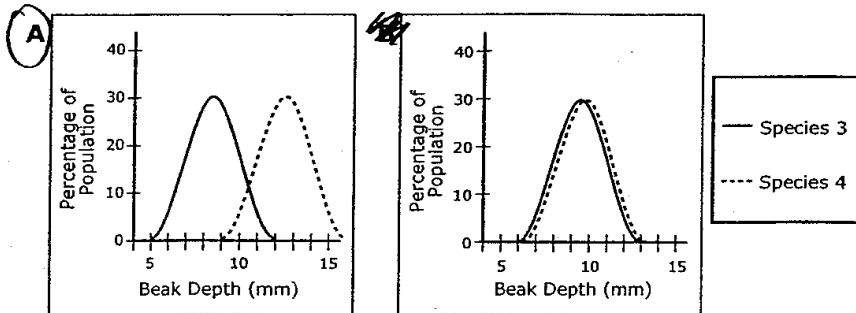
## Student Responses

## Correct Response:

Two other species (Species 3 and Species 4) live on Santa Maria Island, which also has a range of seed types.

Which of the following graphs shows a range of beak depths for Species 3 and Species 4 that would best insure the survival of both species on Santa Maria Island?

(Circle the letter by the correct graph.)



Explain why this range of beak depths would be best.

It is best if the 2 types of birds eat different sized food so they don't have to fight each other for food and can live in peaceful coexistence and not kill each other off fighting for food.

## Galapagos Islands: graphs of beak depths for Species 3 and 4 (continued)

Item Number: S032707

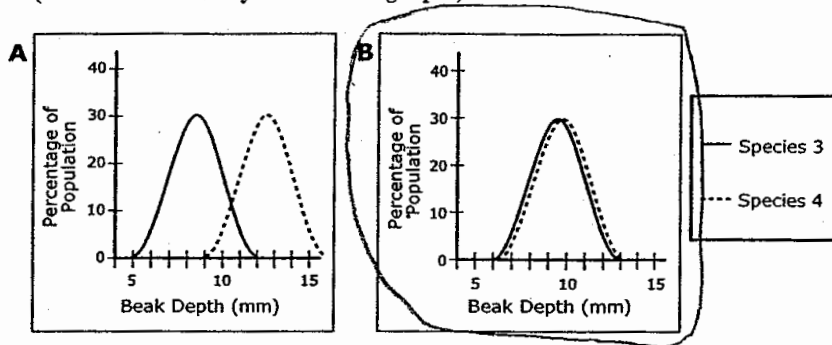
## Student Responses (continued)

## Incorrect Response:

Two other species (Species 3 and Species 4) live on Santa Maria Island, which also has a range of seed types.

Which of the following graphs shows a range of beak depths for Species 3 and Species 4 that would best insure the survival of both species on Santa Maria Island?

(Circle the letter by the correct graph.)



Explain why this range of beak depths would be best.

They would be good for picking seeds.

Content Domain	Main Topic	Cognitive Domain
LIFE SCIENCE	Ecosystems	Conceptual Understanding

Galapagos Islands: plants/animals inhabited island first

Which organisms that live on land most likely inhabited the Galapagos Islands first?

(Check one box.)

Land plants

Land animals

Explain your answer.

Item Number: S032704

SCORING

Note: Credit is given for responses that check PLANTS and give an explanation that refers explicitly to **photosynthesis** or plants making their own food as well those that refer only to the survival or mode of transportation of plants/animals. Responses that check ANIMALS may also receive credit with a reasonable explanation based on transportation and the availability of alternative food sources, e.g., fish.

Correct Response

- **PLANTS** with an explanation based plants being able to make their own food (**photosynthesis**).  
*Examples: Plants can photosynthesize.*  
*Because plant make their own food using light, water and chlorophyll.*
- **PLANTS** with an explanation based only on survival OR mode of transportation of plants/animals. [Photosynthesis or making food not explicitly mentioned.]  
*Examples: They could survive there first because plants only need water and air.*  
*Without plants there would not be animals.*  
*First the plants arrived. Then the animals can come and survive by eating the plants.*  
*Seeds could just be carried by the wind. Animals would have to swim a long distance.*  
*Seeds from South America blew to the islands.*
- **ANIMALS** with a reasonable explanation based on transportation **AND** availability of alternative food sources (may be implicit based on the specific type of animal named).  
*Examples: Birds could fly over to the island to nest and survive by eating fish from the sea.*  
*Seals can swim there and live on the rocky shore. [Assumes seals eat fish.]*
- Other correct.

Incorrect Response

- **PLANTS** with no explanation or an incorrect explanation. [May include a correct statement that does not apply to the situation.]  
*Examples: They just grew from the ground.*  
*Because plants grow faster and live longer.*  
*They are living organisms.*  
*Plants were on Earth before animals.*
- **ANIMALS** with no explanation or an incorrect explanation.  
*Examples: Birds could just eat the seeds in the ground.*  
*They are everywhere.*  
*There will be a surplus of food.*  
*Animals can move but plants cannot.*  
*Animals migrate.*
- Other incorrect (including crossed out/erased, stray marks, illegible or off task).

Overall Percent Correct

Estonia	62	▲
Armenia	55	▲
Singapore	49	▲
New Zealand	49	▲
Japan	48	▲
Latvia	48	▲
Lithuania	48	▲
United States	48	▲
Sweden	46	▲
Norway	44	▲
Hungary	44	▲
Australia	44	▲
Russian Federation	43	▲
Belgium (Flemish)	42	▲
Netherlands	42	▲
England	42	▲
Slovak Republic	41	▲
Korea, Republic of	40	▲
Hong Kong, SAR	40	▲
Scotland	38	▲
Chinese Taipei	38	▲
Malaysia	35	○
Slovenia	33	○
<b>International average</b>	<b>31</b>	
Jordan	30	○
Moldova, Rep. of	29	○
Israel	25	▼
Chile	23	▼
Cyprus	22	▼
Romania	22	▼
Palestinian Nat'l Auth.	21	▼
Italy	21	▼
Serbia and Montenegro	20	▼
Macedonia, Republic of	19	▼
Bulgaria	18	▼
Bahrain	16	▼
Lebanon	16	▼
Iran, Islamic Republic of	15	▼
Indonesia	14	▼
Egypt	12	▼
Tunisia	10	▼
Morocco	10	▼
South Africa	9	▼
Botswana	7	▼
Philippines	6	▼
Saudi Arabia	1	▼
Ghana	0	▼

Country average vs. International average:

Higher	▲
Not different	○
Lower	▼

Galapagos Islands: plants/animals inhabited island first (continued)

Item Number: S032704

Student Responses

Correct Response:

Which organisms that live on land most likely inhabited the Galapagos Islands first?

(Check one box.)

- Land plants
- Land animals

Explain your answer.

Without land plants the earth would not be able to have land animals

Incorrect Response:

Which organisms that live on land most likely inhabited the Galapagos Islands first?

(Check one box.)

- Land plants
- Land animals

Explain your answer.

It does because it gets use to the living.

Content Domain	Main Topic	Cognitive Domain
LIFE SCIENCE	Ecosystems	Conceptual Understanding

## Galapagos Islands: effect of cats

When settlers came to live on the Galapagos Islands, they brought with them a number of new animals such as cats and goats. Write down one effect the introduction of cats and goats could have on the animals and plants already living on the islands.

A. One effect of **cats**:

B. One effect of **goats**:

Item Number: S032705A

## SCORING

## Correct Response

- Refers to cats preying upon other organisms, or similar (resulting in a reduction in population).  
*Examples: They will eat the birds and other animals.*  
*The cats help them by eating the rats and mice.*  
*Their prey could become extinct.*
- Other correct.  
*Examples: They might pass on diseases to other animals.*

## Incorrect Response

- Refers **only** to an effect on the cat with no explicit effect on other organisms.  
*Examples: They cannot survive on the island.*  
*Cats might reproduce and get out of control.*
- Other incorrect (including crossed out/erased, stray marks, illegible, or off task).  
*Examples: The cats might eat all the plants.*

## Overall Percent Correct

Australia	68	▲
New Zealand	66	▲
Estonia	59	▲
Chinese Taipei	58	▲
Armenia	56	▲
Singapore	54	▲
Slovak Republic	52	▲
Lithuania	49	▲
Netherlands	47	▲
Russian Federation	46	▲
Hungary	46	▲
Belgium (Flemish)	46	▲
Latvia	45	▲
United States	45	▲
Hong Kong, SAR	45	▲
England	45	▲
Romania	43	▲
Norway	42	○
Sweden	41	○
Scotland	41	○
Korea, Republic of	40	○
Japan	40	○
Jordan	39	○
<b>International average</b>	<b>36</b>	
Palestinian Nat'l Auth.	36	○
Malaysia	35	○
Slovenia	33	○
Serbia and Montenegro	33	○
Chile	30	▼
Israel	29	▼
Cyprus	28	▼
Egypt	27	▼
Tunisia	27	▼
Bulgaria	26	▼
Moldova, Rep. of	26	▼
Italy	24	▼
Bahrain	23	▼
Iran, Islamic Republic of	22	▼
Botswana	21	▼
Indonesia	20	▼
Lebanon	16	▼
South Africa	14	▼
Morocco	12	▼
Saudi Arabia	9	▼
Macedonia, Republic of	8	▼
Philippines	8	▼
Ghana	0	▼

Country average vs.  
International average:

Higher	▲
Not different	○
Lower	▼



## Galapagos Islands: effect of cats (continued)

Item Number: S032705A

## Student Responses

## Correct Response:

When settlers came to live on the Galapagos Islands, they brought with them a number of new animals such as cats and goats. Write down one effect the introduction of cats and goats could have on the animals and plants already living on the islands.

A. One effect of cats:

Cats could either scare away some of the smaller animals already settled there.

## Incorrect Response:

When settlers came to live on the Galapagos Islands, they brought with them a number of new animals such as cats and goats. Write down one effect the introduction of cats and goats could have on the animals and plants already living on the islands.

A. One effect of cats:

lion + Tiger