

**Science 10: All Domains
Item-Level Response Reports (Provincial Level)**

British Columbia

All Schools

June/2009

Provincial Science 10 Item-Level Response Reports include data for all BC students who wrote the exam in June 2009 (about 33,678). Both public and independent schools are included. The Science 10 June 2009 (All Domains) provincial Item-Level Response Report contains three tables, one for each domain; the tables display the proportion of students who made errors on each test item and a description of the misconception.

Click [here](#) to view the Prescribed Learning Outcomes

1. Question Type: MC

Domain: Earth and Space Science

Form	Item #	Question type	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention [>20% selected incorrect response]
A	60	MC	D1	33484	39%	*
A	61	MC	D1	33531	10%	• N/A
A	62	MC	D1	33520	22%	*
A	63	MC	D1	33529	15%	• N/A
A	64	MC	D1	33491	56%	• Students were unable to correctly interpret a diagram of Earth's Energy Budget; incorrectly answered that greenhouse gases reflect 30% of the incoming solar energy.
A	65	MC	D2	33483	19%	• N/A
A	66	MC	D2	33526	46%	• Students did not understand the relationship between altitude and atmospheric pressure;

						incorrectly answered that as altitude increases, atmospheric pressure increases, not decreases.
A	67	MC	D2	33506	71%	<ul style="list-style-type: none"> • Students did not understand the conditions present in a low pressure centre; correctly answered that surface winds move towards the centre and there would be precipitation with a low pressure centre, but incorrectly answered that there would be falling air, not rising air. • Students did not understand the conditions present in a low pressure centre; correctly answered that there would be rising air, but incorrectly answered that surface winds move away from the centre and there would be dry air with a low pressure centre.
A	68	MC	D3	33509	39%	<ul style="list-style-type: none"> • Students were unable to interpret a short article; correctly answered that a bloom will increase reflection of solar radiation, but incorrectly answered that it will warm the Earth, not cool it.
A	69	MC	D3	33509	45%	<ul style="list-style-type: none"> • Students were unable to interpret a diagram showing the impact of a strong El Nino event on Canadian winter weather; incorrectly answered that a strong El Nino event will cause warmer than normal temperatures in all of Canada.
A	70	MC	D4	33364	39%	*
A	71	MC	D4	33523	53%	<ul style="list-style-type: none"> • Students did not understand the composition of the Earth's layers; correctly answered that the Earth's crust is thinner than the mantle, but incorrectly answered that it is denser, not less dense.

A	72	MC	D4	33516	53%	<ul style="list-style-type: none"> Students did not understand the characteristics of earthquake waves; correctly answered that primary waves could be used to determine the depths of a solid mantle and liquid core, but did not consider secondary waves.
A	73	MC	D4	33490	49%	<ul style="list-style-type: none"> Students were unable to correctly interpret a series of map diagrams showing subduction of a plate; correctly answered that the Farallon Plate subducted, but incorrectly answered that it subducted beneath the Pacific Plate, not the North American Plate.
A	74	MC	D4	33488	57%	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; incorrectly answered that a hot spot is found on the western side of South America, not a subduction zone. Students likely did not refer to the data booklet; incorrectly answered that a rift valley is found on the western side of South America, not a subduction zone.
A	75	MC	D4	33478	55%	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; did not understand the symbols that indicate the presence of a subduction zone; correctly chose the convergent boundary symbol, but incorrectly chose a transform boundary symbol, not a volcanoes symbol. Students likely did not refer to the data booklet; did not understand the symbols that indicate the presence of a subduction zone; incorrectly chose the transform fault and divergent boundary symbols, not the volcanoes and convergent boundary symbols.
A	76	MC	D4	33523	34%	*

A	77	MC	D4	33503	75%	<ul style="list-style-type: none"> Students were unable to interpret a map of the East African Rift Zone; likely did not refer to the data booklet; incorrectly answered that a subduction zone will form along the Gulf of Aden, not that sea water will flood the East African Rift Zone.
A	78	MC	D4	33514	55%	<ul style="list-style-type: none"> Students did not understand the processes that produce the trenches which outline the Ring of Fire; incorrectly answered that divergence of oceanic crust will form trenches, not subduction of an oceanic plate.
A	79	MC	D4	33505	79%	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; incorrectly answered that an apparent opposing motion of two hot spots was due to slab pull at the Eastern edge of the Pacific Plate, not the ridge push at the East Pacific Rise. Students likely did not refer to the data booklet; incorrectly answered that an apparent opposing motion of two hot spots was due to divergence of the North American Plate and the Pacific Plate, not the ridge push at the East Pacific Rise. Students likely did not refer to the data booklet; incorrectly answered that an apparent opposing motion of two hot spots was due to mantle magma rising at several locations along the hot spot island chain, not the ridge push at the East Pacific Rise.
A	80	MC	D5	33515	47%	<ul style="list-style-type: none"> Students did not understand the evidence that

						Alfred Wegener used to support his Continental Drift Theory; correctly answered that Alfred Wegener used fossil evidence, jigsaw puzzle fit of continents, and matching up of mountain ranges to support his Continental Drift Theory, but incorrectly answered that he also used magnetic reversal in the ocean crust.
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Note:

'*' indicates that there were fewer than 20% of the students who selected any of the possible incorrect answers to the item, hence, no curricular note is reported;

'N/A' indicates that there were fewer than 20% of the students who incorrectly answered the item, hence, no curricular note is reported.

Question Type: Multiple Choice (MC).

Click [here](#) to view the Prescribed Learning Outcomes

2. Question Type: MC Domain: Life Science

Form	Item #	Question type	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention [>20% selected incorrect response]
A	1	MC	B1	33523	25%	*
A	2	MC	B1	33527	13%	• N/A
A	3	MC	B1	33524	22%	*
A	4	MC	B1	33481	27%	*
A	5	MC	B1	33519	23%	*

A	6	MC	B1	33541	6%	<ul style="list-style-type: none"> N/A
A	7	MC	B1	33516	28%	<ul style="list-style-type: none"> *
A	8	MC	B1	33471	61%	<ul style="list-style-type: none"> Students did not understand how to interpret the difference between carbon released and carbon stored in the carbon cycle; likely did not refer to the data booklet.
A	9	MC	B1	33504	52%	<ul style="list-style-type: none"> Students did not understand the term "oxygen and carbon dioxide exchange"; incorrectly answered that microbes and worms add oxygen to the atmosphere and remove carbon dioxide; likely did not refer to the data booklet.
A	10	MC	B1	33498	29%	<ul style="list-style-type: none"> *
A	11	MC	B1	33536	15%	<ul style="list-style-type: none"> N/A
A	12	MC	B1	33539	14%	<ul style="list-style-type: none"> N/A
A	13	MC	B1	33539	18%	<ul style="list-style-type: none"> N/A
A	14	MC	B1	33526	15%	<ul style="list-style-type: none"> N/A
A	15	MC	B2	33483	35%	<ul style="list-style-type: none"> Students did not understand the term "biomagnification"; incorrectly answered that grass would result in the highest concentration of pesticides in a food chain, not birds.
A	16	MC	B3	33496	49%	<ul style="list-style-type: none"> Students did not understand the term "natural selection"; were unable to correctly interpret a comic picture showing natural selection; confused ecological succession with natural selection.

A	17	MC	B3	33534	27%	*
A	18	MC	B3	33511	33%	*
A	19	MC	B3	33521	19%	• N/A
A	20	MC	B1	33513	15%	• N/A
A	21	MC	B3	33519	28%	*

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Question Type: Multiple Choice (MC).

Click [here](#) to view the Prescribed Learning Outcomes

3. Question Type: MC Domain: Physical Science

Form	Item #	Question type	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention [>20% selected incorrect response]
A	22	MC	C1	33529	14%	• N/A
A	23	MC	C1	33467	61%	• Students did not understand how to identify a covalently bonded molecule when given an element's name; incorrectly answered that helium is a covalently bonded molecule, not bromine.
A	24	MC	C1	33511	42%	• Students did not understand how to interpret a Bohr diagram; chose the correct element but incorrectly answered that the diagram was an

						atom, not an ion; likely did not refer to the data booklet.
A	25	MC	C1	33497	33%	*
A	26	MC	C1	33499	52%	<ul style="list-style-type: none"> Students did not understand how to interpret a Lewis diagram of an unknown element; correctly chose an atom of an element with eight outer electrons, but chose an atom with only seven outer electrons for the second atom, not eight.
A	27	MC	C1	33489	43%	<ul style="list-style-type: none"> Students did not understand the term "valence electrons"; incorrectly answered that lone pairs and bonding pairs of electrons both form covalent bonds, instead of answering that both are valence electrons.
A	28	MC	C2	33516	22%	*
A	29	MC	C2	33528	13%	<ul style="list-style-type: none"> N/A
A	30	MC	C2	33349	67%	<ul style="list-style-type: none"> Students did not understand that non-metal oxides produce acidic solutions; incorrectly answered that alkali metals will produce an acidic solution when dissolved in rainwater, not non-metal oxides. Students did not understand that non-metal oxides produce acidic solutions; incorrectly answered that metal oxides will produce an acidic solution when dissolved in rainwater, not non-metal oxides.
A	31	MC	C2	33527	32%	*
A	32	MC	C2	33510	36%	*

A	33	MC	C2	33524	15%	<ul style="list-style-type: none"> N/A
A	34	MC	C2	33494	31%	*
A	35	MC	C2	33482	14%	<ul style="list-style-type: none"> N/A
A	36	MC	C3	33503	44%	*
A	37	MC	C4	33523	34%	<ul style="list-style-type: none"> Students did not understand how to balance a chemical reaction when given a diagram representing molecules of reactants and products; correctly balanced the hydrogen atoms, but did not balance the oxygen atoms correctly.
A	38	MC	C4	33510	22%	*
A	39	MC	C4	33485	35%	*
A	40	MC	C4	33512	37%	*
A	41	MC	C4	33508	48%	<ul style="list-style-type: none"> Students were unable to predict the chemical formulae of the products of a neutralization reaction when given the names of the reactants; incorrectly answered the question for the formulae of the reactants of the reaction, not the products.
A	42	MC	C4	33520	36%	<ul style="list-style-type: none"> Students did not understand the factors that speed up a chemical reaction; could not correctly interpret a picture showing an increase in surface area when baking; incorrectly answered that increased concentration was the factor that accounted for

						the shorter cooking time in a picture, not an increased surface area.
A	43	MC	C5	33507	18%	• N/A
A	44	MC	C5	33453	44%	*
A	45	MC	C5	33474	30%	*
A	46	MC	C5	33472	51%	<ul style="list-style-type: none"> Students did not understand how to interpret a fusion reaction when given the chemical formulae of the reactants and products; chose the correct elements and symbols for the reactants in the equation with the atomic mass and atomic number in the correct positions, but incorrectly chose the symbol for one of the products by using the element's atomic mass to determine the element's symbol, instead of using the element's atomic number.
A	47	MC	C6	33507	47%	<ul style="list-style-type: none"> Students did not understand the term "displacement"; incorrectly answered for the largest distance and the smallest displacement, not the greatest displacement.
A	48	MC	C6	33518	40%	<ul style="list-style-type: none"> Students did not understand the terms "speed" and "velocity"; incorrectly compared speed to acceleration, not velocity.
A	49	MC	C6	33507	20%	*
A	50	MC	C6	33507	6%	• N/A
A	51	MC	C6	33513	30%	*
A	52	MC	C6	33509	38%	<ul style="list-style-type: none"> Students did not understand the term

						"displacement"; did not understand the unit associated with displacement in motion formulae; incorrectly answered that "m/s" is associated with displacement, not "m".
A	53	MC	C6	33516	25%	*
A	54	MC	C6	33499	47%	<ul style="list-style-type: none"> Students were unable to calculate distance when given speed and time; correctly multiplied speed by time, but did not convert time from minutes into seconds.
A	55	MC	C7	33498	15%	<ul style="list-style-type: none"> N/A
A	56	MC	C7	33500	46%	<ul style="list-style-type: none"> Students were unable to calculate final velocity when given initial velocity, acceleration and time; incorrectly added acceleration to the initial velocity, instead of calculating final velocity; likely did not refer to the data booklet.
A	57	MC	C7	33525	22%	*
A	58	MC	C7	33514	22%	*
A	59	MC	C7	33499	48%	*

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