

**Science 10: Physical Science  
Item-Level Response Report (Provincial Level)**

**British Columbia**

**All Schools**

**June/2008**

Provincial Science 10 Item-Level Response Reports include data for all BC students who wrote the exam in June 2008 (about 34,740 students). Both public and independent schools are included. The Science 10 June 2008 (Physical Science) provincial Item-Level Response Report displays the proportion of students who made errors on each test item and a description of the misconception.

<b>Form</b>	<b>Item #</b>	<b>Question type</b>	<b>Number of Students who Responded to the Item</b>	<b>Percentage of Students who Answered Incorrectly</b>	<b>Specific Curricular Aspect that Needs Attention [&gt;20% selected incorrect response]</b>
A	30	MC	34606	67	<ul style="list-style-type: none"> <li>Students were unable to determine how many electrons are in an ion of an element; incorrectly answered that the charge on the ion was the number of electrons in the ion.</li> <li>Students were unable to determine how many electrons are in an ion of an element; incorrectly answered the question for the number of electrons in an atom of the element, not an ion of the element.</li> </ul>
A	31	TF	34729	20	*
A	32	TF	34716	32	<ul style="list-style-type: none"> <li>Students did not understand how atoms become stable when their outer shells are full.</li> </ul>
A	33	MC	34688	55	<ul style="list-style-type: none"> <li>Students did not understand the term "isotope"; did not understand the similarities and differences between isotopes of the same element; correctly answered that the number of protons is the same in two isotopes of the same element, but incorrectly answered that the mass number was also the same.</li> </ul>
A	34	MC	34655	32	*

A	35	TF	34568	30	<ul style="list-style-type: none"> <li>Students did not understand how to calculate an atom's ion charge when given a chemical formula.</li> </ul>
A	36	TF	34720	13	N/A
A	37	MC	34646	42	<ul style="list-style-type: none"> <li>Students did not understand the characteristics of a covalent bond; mistook an ionic compound for a covalent compound.</li> </ul>
A	38	MT	34652	29	*
A	39	MT	34617	43	<ul style="list-style-type: none"> <li>Students did not understand the rules for writing formulae for covalent compounds when given the chemical name; wrote the correct symbol for the metal but chose the incorrect polyatomic ion.</li> </ul>
A	40	TF	34681	25	<ul style="list-style-type: none"> <li>Students did not understand the term "diatomic".</li> </ul>
A	41	MC	34680	47	<ul style="list-style-type: none"> <li>Students were unable to correctly interpret a small article; likely did not refer to the data booklet; did not understand how to write a chemical formula of a product formed when given two reactants.</li> </ul>
A	42	MC	34711	32	*
A	43	MC	34623	63	<ul style="list-style-type: none"> <li>Students did not understand how to determine an element's ion charge and how to write a chemical formula for an ionic compound between two elements; correctly identified one element's ion charge, but incorrectly wrote the coefficient under the wrong element.</li> </ul>
A	44	MC	34595	63	<ul style="list-style-type: none"> <li>Students did not understand how to determine and compare an element's ion charge when given different chemical formulae.</li> </ul>
A	45	MC	34643	24	*
A	46	TF	34705	36	<ul style="list-style-type: none"> <li>Students did not understand the products that are</li> </ul>

					formed when an acid and a base are combined.
A	47	MC	34691	26	*
A	48	MC	34683	34	*
A	49	MT	34575	40	*
A	50	MT	34591	25	*
A	51	MT	34568	44	*
A	52	MC	34654	34	*
A	53	MC	34657	28	*
A	54	TF	34709	13	N/A
A	55	MC	34596	65	<ul style="list-style-type: none"> <li>• Students did not understand the characteristics of an alpha particle; correctly answered that an alpha particle is heavier than a beta particle, and that it has the same charge as two protons, but did not include that it is made of matter.</li> <li>• Students did not understand the characteristics of an alpha particle; correctly answered that an alpha particle is made of matter and that it is heavier than a beta particle, but did not consider that it has the same charge as two protons.</li> </ul>
A	56	TF	34717	12	N/A
A	57	MC	34684	52	<ul style="list-style-type: none"> <li>• Students were unable to correctly interpret a small article; incorrectly answered that cobalt-60 is useful in radiation therapy as it is a stable isotope.</li> </ul>
A	58	MC	34664	44	*
A	59	MC	34686	34	*
A	60	MC	34698	46	<ul style="list-style-type: none"> <li>• Students were unable to correctly interpret a small article; incorrectly answered that electromagnetism was used in a photocopier, not static electricity.</li> </ul>
A	61	TF	34694	30	<ul style="list-style-type: none"> <li>• Students did not understand the laws of attraction</li> </ul>

					and repulsion of static electricity.
A	62	TF	34675	16	N/A
A	63	MC	34668	39	<ul style="list-style-type: none"> <li>Students did not correctly interpret a small article; incorrectly answered that solar radiation and electricity were responsible for the aurora borealis, not magnetism and electricity.</li> </ul>
A	64	TF	34655	21	<ul style="list-style-type: none"> <li>Students were unable to correctly interpret a small article; were unable to calculate power when given voltage and current; likely did not refer to the data booklet.</li> </ul>
A	65	TF	34588	13	N/A
A	66	TF	34682	25	<ul style="list-style-type: none"> <li>Students did not understand the relationship of the direction of the magnetic field and the current; did not understand the right-hand rule.</li> </ul>
A	67	MC	34658	21	*
A	68	TF	34676	42	<ul style="list-style-type: none"> <li>Students did not understand the relationship between current and voltage through a resistor.</li> </ul>
A	69	MC	34662	58	<ul style="list-style-type: none"> <li>Students were unable to correctly interpret a small article; confused transformers with resistors.</li> </ul>
A	70	MC	34615	30	*
A	71	MC	34675	45	<ul style="list-style-type: none"> <li>Students did not understand how to calculate and compare total voltage for cells connected in series and parallel.</li> </ul>
A	72	MC	34639	56	<ul style="list-style-type: none"> <li>Students incorrectly calculated the total voltage in the circuit, instead of the voltage across one resistor; likely did not refer to the data booklet.</li> </ul>
A	73	MC	34662	11	N/A

A	74	MC	34570	60	<ul style="list-style-type: none"> <li>Students did not understand how to compare current and resistance at different points in a series circuit.</li> </ul>
A	75	MT	33994	34	*
A	76	MT	34492	49	*
A	77	MT	34518	42	*
A	78	MT	34462	50	*
A	79	MT	34477	44	*
A	80	MC	34617	66	<ul style="list-style-type: none"> <li>Students correctly answered that the voltage across each branch in a parallel circuit is equal and that a single switch can be placed to control current flow to both branches, but did not consider that each branch operates independently.</li> </ul>
A	81	TF	34665	22	<ul style="list-style-type: none"> <li>Students did not understand how to calculate energy when given power and time; likely did not refer to the data booklet.</li> </ul>
A	82	MC	34605	63	<ul style="list-style-type: none"> <li>Students did not understand how to calculate power in a parallel circuit when given voltage and resistance; likely did not refer to the data booklet.</li> </ul>
A	83	MC	34645	61	<ul style="list-style-type: none"> <li>Students used the correct formula for energy used when given voltage, current and time, but incorrectly used the voltage for one cell when there were three connected in series; did not understand how to calculate total voltage of a series connection of cells.</li> </ul>
A	84	MC	34535	68	<ul style="list-style-type: none"> <li>Students did not understand how to calculate current when given voltage, energy and time; likely did not refer to the formulae in the data booklet.</li> </ul>
A	85	MC	34609	42	<ul style="list-style-type: none"> <li>Students incorrectly answered that silk allows electrons to flow through it, not that it is an insulator.</li> </ul>

A	86	TF	34661	5	N/A
A	87	MC	34538	68	<ul style="list-style-type: none"> <li>Students did not understand how to calculate energy in kWh when given power and time, and then compare that number to meter readings from various appliances.</li> </ul>

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), Matching (MT), True/False (TF).