

**Science 10 Earth and Space Science
Item-level Response Report - Multiple Choice (Provincial Level)**

British Columbia All Schools June /2006

Provincial Science 10 Item-Level Response Reports include data for all BC students who wrote the exam in June 2006 (about 32,300 students). Both public and independent schools are included. The Science 10 June 2006 (Earth and Space Science) provincial Item-Level Response Report displays the proportion of students who made errors on each test item and a description of the misconception.

Form	Item #	Question type	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	88	MT	5453	49	*
A	89	MT	5461	66	<ul style="list-style-type: none"> Students did not understand how to interpret a seismogram; mistook S-waves for L-waves.
A	90	MT	5462	63	<ul style="list-style-type: none"> Students mistook L-waves for P-waves in terms of their speed; incorrectly answered that L-waves are the fastest seismic waves.
A	91	MT	5470	80	<ul style="list-style-type: none"> Students incorrectly answered that L-waves travel through all layers of the Earth; mistook L-waves for P-waves. Students incorrectly answered that P-waves, S-waves, and L-waves travel through all layers of the Earth, instead of only P-waves.
A	92	MT	5467	70	<ul style="list-style-type: none"> Students incorrectly answered that P-waves, S-waves, and L-waves only travel through the crust and mantle, instead of only S-waves.
A	93	MC	5471	42	<ul style="list-style-type: none"> Students did not understand the function of remote

					sensing to produce images; confused geological field work with remote sensing.
A	94	MC	5472	42	*
A	95	MC	5448	72	<ul style="list-style-type: none"> • Students correctly answered that seismic waves speed up through the crust and uppermost mantle, but incorrectly answered that the waves continue to speed up in the asthenosphere. • Students correctly understood that seismic waves travel increasingly faster through the crust, but incorrectly answered that they slow down through the mantle and speed up in the asthenosphere. • Students incorrectly answered that seismic waves travel the same speed through the crust, uppermost mantle and the asthenosphere.
A	96	TF	5476	27	<ul style="list-style-type: none"> • Students likely did not refer to the data booklet; did not understand that early Paleozoic and Precambrian fossils were not land-dwelling organisms.
A	97	TF	5474	18	N/A
A	98	MC	5475	27	*
A	99	MC	5474	45	<ul style="list-style-type: none"> • Students read an article and incorrectly answered that an organism lived in a climate like today's northern Manitoba (where it was found), instead of in a tropical climate near the equator. • Students were unable to interpret an article to determine that there was enough information given to refute a statement about the article.
A	100	MC	5473	45	<ul style="list-style-type: none"> • Students were unable to interpret an article to determine that there was enough information given to

					support a statement about the article.
A	101	TF	5471	67	<ul style="list-style-type: none"> Students did not understand how to compare the ages of rock layers from a diagram by using the Cross-cutting Rule.
A	102	TF	5471	19	N/A
A	103	MC	5460	45	*
A	104	MC	5454	66	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; did not understand how to calculate a rock sample's age when given its half life and percent composition; incorrectly calculated the age of a rock sample for one half life, instead of two.
A	105	TF	5462	19	N/A
A	106	TF	5470	28	<ul style="list-style-type: none"> Students did not understand the relationship of convection currents within the mantle and plate movement; incorrectly answered that convection currents within the mantle did not rise at divergent plate boundaries.
A	107	MC	5467	40	<ul style="list-style-type: none"> Students correctly answered that divergent and convergent were types of plate boundaries, but did not include transform.
A	108	MC	5461	49	<ul style="list-style-type: none"> Students correctly answered that the ocean crust and continental crust are moving towards each other, but incorrectly answered that the continental crust was being subducted under the oceanic crust, instead of the ocean crust being subducted under the continental crust.
A	109	MC	5463	41	*
A	110	MC	5457	61	<ul style="list-style-type: none"> Students did not understand how an island can form from volcanic activity at a convergent oceanic-oceanic plate boundary; did not understand the term "hot

					spot”.
A	111	MC	5467	70	<ul style="list-style-type: none"> Students answered incorrectly that magnetic reversal evidence from the ocean floor occurs at an oceanic-continental convergent boundary, not a divergent boundary. Students answered incorrectly that magnetic reversal evidence from the ocean floor occurs at an oceanic-oceanic convergent boundary, not a divergent boundary.
A	112	MC	5464	50	<ul style="list-style-type: none"> Students correctly answered that fossils and minerals in rock formations on separate continents are evidence used to support the Continental Drift Theory, but did not include the age of the rocks as further evidence.
A	113	MC	5466	35	*
A	114	MC	5469	56	<ul style="list-style-type: none"> Students did not understand the terms “trench” or “subduction”.
A	115	TF	5469	23	<ul style="list-style-type: none"> Students did not understand that earthquakes are usually located near plate boundaries.
A	116	TF	5469	30	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; did not understand the relationship between plate boundaries and volcanic eruptions.
B	88	MC	4762	30	<ul style="list-style-type: none"> Students were unable to correctly identify a seismogram from a picture; mistook a seismometer for a seismogram.
B	89	MC	4759	53	<ul style="list-style-type: none"> Students correctly answered that a seismogram records primary and secondary waves, but did not

					include surface waves.
B	90	TF	4753	18	N/A
B	91	MC	4766	24	*
B	92	MC	4765	37	*
B	93	TF	4763	51	<ul style="list-style-type: none"> Students did not understand the term "relative age dating"; confused relative age dating with absolute age dating.
B	94	TF	4765	51	<ul style="list-style-type: none"> Students did not understand the Cross-cutting Rule; misinterpreted a diagram showing that a rock formation cut into another one from below, making it a younger formation than the rock layer that was being cut.
B	95	TF	4759	56	<ul style="list-style-type: none"> Students did not consider that an isotope could be suitable for radiometric dating only if it was present in the rock when it was formed, and atoms of both parent isotope and decay products were sealed within the rock so there was no contamination or loss.
B	96	MC	4759	62	<ul style="list-style-type: none"> Students incorrectly answered the question for how much of the radioactive element would remain after three half-lives, instead of four. Students incorrectly answered the question for how much of the radioactive element would remain after two half-lives, instead of four.
B	97	MC	4761	40	*
B	98	MC	4742	48	<ul style="list-style-type: none"> Students did not understand the term "half-life"; were able to calculate the ages of two rock samples when given their half-lives and the amount of decay in a diagram, but incorrectly calculated the age for one rock sample.

B	99	TF	4760	56	<ul style="list-style-type: none"> Students incorrectly answered that magnetic reversal patterns on the sea floor are evidence of subduction zones.
B	100	TF	4762	48	<ul style="list-style-type: none"> Students did not understand the movement or direction of convection currents.
B	101	TF	4763	53	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; answered incorrectly that California is being split by a divergent plate boundary; confused a divergent plate boundary with a transform plate boundary.
B	102	MT	4758	25	*
B	103	MT	4754	66	<ul style="list-style-type: none"> Students did not understand the term "lithosphere"; confused the lithosphere with a diagram of the upper mantle (the lower part of the lithosphere).
B	104	MT	4754	53	<ul style="list-style-type: none"> Students did not understand the term "asthenosphere"; confused the asthenosphere with a diagram of the upper mantle (the lower part of the lithosphere).
B	105	MT	4754	15	N/A
B	106	MT	4766	39	*
B	107	MC	4758	62	<ul style="list-style-type: none"> Students did not understand the processes that occur at divergent plate boundaries; confused a subduction zone with a divergent plate boundary.
B	108	MC	4759	52	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; correctly identified two of the three types of plate boundaries surrounding the Juan de Fuca Plate.
B	109	MC	4756	36	*
B	110	MC	4744	45	*
B	111	MC	4760	47	<ul style="list-style-type: none"> Students did not understand the difference between

					Continental Drift Theory and Plate Tectonics Theory; incorrectly answered that both theories explain why plates move.
B	112	MC	4760	36	*
B	113	TF	4762	20	*
B	114	MC	4764	65	<ul style="list-style-type: none"> Students answered incorrectly that earthquake waves would have the most effect on the environment world-wide, instead of volcanic ash.
B	115	MC	4750	42	<ul style="list-style-type: none"> Students did not understand the applications of remote sensing; confused seismology with remote sensing.
B	116	MC	4766	44	*
C	88	MT	5450	17	N/A
C	89	MT	5435	58	<ul style="list-style-type: none"> Students did not understand the term "seismic activity"; confused convection currents with seismic activity.
C	90	MT	5427	60	<ul style="list-style-type: none"> Students did not understand the term "magnetism"; confused convection currents with magnetism.
C	91	MT	5442	64	<ul style="list-style-type: none"> Students did not understand the term "convection"; confused magnetism in the ocean crust with convection.
C	92	MT	5454	20	*
C	93	TF	5457	20	<ul style="list-style-type: none"> Students did not understand the term "index fossil"; did not recognize an index fossil in a diagram of a cross-section of rock; incorrectly answered that an index fossil can be found in two different layers in a sample of rock layers.
C	94	MC	5450	29	*

C	95	MC	5428	23	*
C	96	MC	5457	23	*
C	97	MC	5454	48	*
C	98	MC	5453	32	*
C	99	TF	5458	11	N/A
C	100	MC	5452	54	<ul style="list-style-type: none"> Students incorrectly answered that the absolute age of the construction of the pyramids can be calculated from the age of the fossils found within the rocks, because the fossils are organic and contained carbon-14.
C	101	MC	5453	56	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; did not understand how to calculate the age in years of a sample when given the age of the sample in half-lives.
C	102	MC	5456	46	<ul style="list-style-type: none"> Students did not understand the description "dome-shaped hill", but correctly understood that the oldest layers are on the bottom of a set of rock layers.
C	103	TF	5456	37	<ul style="list-style-type: none"> Students did not understand how mountain ranges are formed; answered incorrectly that all mountain ranges on Earth are the result of continental-continental convergence.
C	104	TF	5458	14	N/A
C	105	TF	5450	40	<ul style="list-style-type: none"> Students did not understand how convection currents move within the Earth, and how their movement causes heat within the Earth to be lost at the Earth's surface.
C	106	TF	5462	27	<ul style="list-style-type: none"> Students did not understand that the highest volcanic island is higher than Mt. Everest.
C	107	TF	5457	67	<ul style="list-style-type: none"> Students did not understand the term "seismology";

					confused seismology with the use of satellite measurements to measure the movement of the Earth's crust.
C	108	MC	5453	46	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; incorrectly answered that the Pacific Plate moving because of transform faults along the East Pacific Rise can explain the movement of the islands of Maui and Hawaii, instead of the fact that the Pacific Plate is moving over the hot spot.
C	109	MC	5448	63	<ul style="list-style-type: none"> Students correctly answered that some plates contain only oceanic lithosphere, but incorrectly included that some plates contain only continental lithosphere, and did not include that plates move on the asthenosphere, and that some plates contain both continental and oceanic lithosphere. Students correctly answered that tectonic plates move on the asthenosphere, and that some plates contain both continental and oceanic lithosphere, but did not include that some plates contain only oceanic lithosphere.
C	110	MC	5439	24	*
C	111	MC	5459	17	N/A
C	112	MC	5455	75	<ul style="list-style-type: none"> Students did not understand that earthquakes show the location of subducting lithosphere.
C	113	MC	5443	50	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; were unable to interpret the geological time scale for the time period when Pangea broke apart.
C	114	MC	5451	56	<ul style="list-style-type: none"> Students did not understand the term "transform plate boundary"; did not understand the type of movement found at a transform plate boundary;

					confused a description of a transform plate boundary for an oceanic-oceanic convergent plate boundary.
C	115	MC	5454	73	<ul style="list-style-type: none"> Students correctly answered that only one trench will form at an oceanic-oceanic convergent plate boundary, but incorrectly answered that volcanoes will form on either side of the trench. Students incorrectly answered that two trenches will form, with volcanoes forming between them, when two oceanic plates converge.
C	116	TF	5454	19	N/A
D	88	TF	5131	35	<ul style="list-style-type: none"> Students did not understand the function of a seismometer; confused a seismometer with the study of magnetic reversals on the sea floor.
D	89	TF	5131	32	<ul style="list-style-type: none"> Students did not understand the function of remote sensing, and its application of collecting data for moons and planets beyond Earth.
D	90	MC	5116	46	<ul style="list-style-type: none"> Students were unable to identify a seismogram that would be used to determine the distance to the epicenter of an earthquake; correctly understood that L (surface)-waves arrive last, but incorrectly answered that S-waves arrive before P-waves.
D	91	MC	5122	70	<ul style="list-style-type: none"> Students incorrectly answered that the difference in speed of primary and secondary seismic waves led to the identification of Earth's outer core, instead of the difference in the speed of P and S-waves.
D	92	TF	5127	24	<ul style="list-style-type: none"> Students likely did not refer to the geological time scale in the data booklet; answered incorrectly that trilobite fossils are not formed in marine sedimentary

					rock.
D	93	TF	5128	10	N/A
D	94	MC	5127	40	<ul style="list-style-type: none"> Students likely did not refer to the geological time scale in the data booklet; correctly answered that the Mesozoic Era was associated with the Age of Reptiles, but did not include all dinosaur fossils and the first flowering plants.
D	95	MC	5095	63	<ul style="list-style-type: none"> Students likely did not refer to the geological time scale in the data booklet; did not understand how to calculate the relative time taken to reach the Cambrian Explosion with the geological time scale compressed into twelve hours. Students likely did not refer to the geological time scale in the data booklet; likely misread the question and answered for how many hours would remain after the Cambrian Explosion on a compressed time scale, instead of how many hours would pass before the Cambrian Explosion would occur.
D	96	TF	5126	33	<ul style="list-style-type: none"> Students did not understand the process of radioactive decay; did not understand the relationship between the decreasing amount of the parent isotope and increasing amounts of the decay product as time goes on.
D	97	TF	5127	60	<ul style="list-style-type: none"> Students did not understand the process of radioactive decay; did not understand how to calculate the ratio of parent isotope to daughter isotopes after three half-lives.
D	98	MC	5124	69	<ul style="list-style-type: none"> Students incorrectly answered that potassium-40 isotope age dating requires careful collection of rock samples because potassium-40 decays at an

					extremely rapid rate, instead of argon-40 being a gas that is easily lost to the environment.
D	99	MC	5131	15	N/A
D	100	MC	5131	38	<ul style="list-style-type: none"> Students analyzed a diagram and incorrectly used the law of superposition or the cross-cutting rule to incorrectly answer that a statement about a rock layer being younger than another was refuted, when this was neither supported nor refuted by the diagram.
D	101	MC	5128	26	<ul style="list-style-type: none"> Students analyzed a diagram and used the law of superposition to incorrectly answer that a rock layer was younger than another, instead of older.
D	102	MT	5127	8	N/A
D	103	MT	5118	41	<ul style="list-style-type: none"> Students did not understand the term "transform fault"; mistook a transform fault with a diagram of a divergent plate boundary.
D	104	MT	5125	35	<ul style="list-style-type: none"> Students did not understand the term "lithosphere"; mistook the lithosphere with a diagram of the asthenosphere.
D	105	MT	5118	37	<ul style="list-style-type: none"> Students did not understand the term "asthenosphere"; mistook the asthenosphere with a diagram of the lithosphere.
D	106	MT	5120	41	<ul style="list-style-type: none"> Students did not understand the term "divergent plate boundary"; mistook a divergent plate boundary with a diagram of a transform fault.
D	107	TF	5131	52	<ul style="list-style-type: none"> Students did not understand the term "transform fault plate boundary"; did not understand the type of movement that occurs at a transform fault plate

					boundary.
D	108	TF	5133	49	<ul style="list-style-type: none"> Students did not understand the cause of deep earthquakes within the mantle; incorrectly answered that magma rising within the mantle causes deep earthquakes within the mantle.
D	109	MC	5121	44	*
D	110	MC	5103	69	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; incorrectly answered that oceanic-continental plate boundaries occur at ocean trenches, instead of subduction zones. Students likely did not refer to the data booklet; incorrectly answered that oceanic-oceanic plate boundaries occur at ocean trenches, instead of subduction zones.
D	111	MC	5133	57	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; answered incorrectly that the San Andreas Fault is a divergent plate boundary, instead of a transform plate boundary. Students likely did not refer to the data booklet; answered incorrectly that the San Andreas Fault is an oceanic-continental convergent plate boundary, instead of a transform plate boundary.
D	112	MC	5120	50	*
D	113	MC	5121	41	<ul style="list-style-type: none"> Students incorrectly answered that Plate Tectonic Theory was the first concept presented to the scientific community, not the Continental Drift Theory.
D	114	MC	5125	59	<ul style="list-style-type: none"> Students correctly answered that seafloor spreading and the location of volcanoes and earthquakes

					support the Theory of Plate Tectonics, but did not include matching fossil evidence and matching ancient rocks on adjacent continents.
D	115	MC	5126	32	<ul style="list-style-type: none"> Students analyzed a graph and correctly understood that the location should be underground, but incorrectly answered that the percent area of the Earth's crust was large to represent an ocean trench, not small.
D	116	MC	5125	35	<ul style="list-style-type: none"> Students incorrectly answered that an earthquake is most likely to give warning signs before occurring, allowing people to be safely evacuated, instead of a volcanic eruption.
E	88	TF	5689	32	<ul style="list-style-type: none"> Students did not understand the function of a seismometer; confused a seismometer with the study of magnetic reversals on the sea floor.
E	89	TF	5691	32	<ul style="list-style-type: none"> Students did not understand the function of remote sensing, and its application of collecting data for moons and planets beyond Earth.
E	90	MC	5676	41	<ul style="list-style-type: none"> Students were unable to identify a seismogram that would be used to determine the distance to the epicenter of an earthquake; correctly understood that L (surface)-waves arrive last, but incorrectly answered that S-waves arrive before P-waves.
E	91	MC	5682	72	<ul style="list-style-type: none"> Students incorrectly answered that the difference in speed of primary and secondary seismic waves led to the identification of Earth's outer core, instead of the difference in the speed of P and S-waves. Students incorrectly answered that the refraction of secondary seismic waves led to the identification of

					Earth's outer core, instead of the difference in the speed of P and S-waves.
E	92	TF	5687	25	<ul style="list-style-type: none"> Students likely did not refer to the geological time scale in the data booklet; answered incorrectly that trilobite fossils are not formed in marine sedimentary rock.
E	93	TF	5690	10	N/A
E	94	MC	5685	35	*
E	95	MC	5668	60	<ul style="list-style-type: none"> Students likely did not refer to the geological time scale in the data booklet; did not understand how to calculate the relative time taken to reach the Cambrian Explosion with the geological time scale compressed into twelve hours. Students likely did not refer to the geological time scale in the data booklet; likely misread the question and answered for how many hours would remain after the Cambrian Explosion on a compressed time scale, instead of how many hours would pass before the Cambrian Explosion would occur.
E	96	TF	5693	30	<ul style="list-style-type: none"> Students did not understand the process of radioactive decay; did not understand the relationship between the decreasing amount of the parent isotope and increasing amounts of the decay product as time goes on.
E	97	TF	5694	50	<ul style="list-style-type: none"> Students did not understand the process of radioactive decay; did not understand how to calculate the ratio of parent isotope to daughter isotopes after three half-lives.
E	98	MC	5678	63	<ul style="list-style-type: none"> Students incorrectly answered that potassium-40 isotope age dating requires careful collection of rock

					samples because potassium-40 decays at an extremely rapid rate, instead of argon-40 being a gas that is easily lost to the environment.
E	99	MC	5694	14	N/A
E	100	MC	5693	39	<ul style="list-style-type: none"> Students analyzed a diagram and incorrectly used the law of superposition or the cross-cutting rule to incorrectly answer that a statement about a rock layer being younger than another was refuted, when this was neither supported nor refuted by the diagram.
E	101	MC	5689	24	*
E	102	MT	5692	7	N/A
E	103	MT	5673	35	<ul style="list-style-type: none"> Students did not understand the term "transform fault"; mistook a transform fault with a diagram of a divergent plate boundary.
E	104	MT	5680	32	<ul style="list-style-type: none"> Students did not understand the term "lithosphere"; mistook the lithosphere with a diagram of the asthenosphere.
E	105	MT	5678	34	<ul style="list-style-type: none"> Students did not understand the term "asthenosphere"; mistook the asthenosphere with a diagram of the lithosphere.
E	106	MT	5691	35	<ul style="list-style-type: none"> Students did not understand the term "divergent plate boundary"; mistook a divergent plate boundary with a diagram of a transform fault.
E	107	TF	5694	50	<ul style="list-style-type: none"> Students did not understand the term "transform fault plate boundary"; did not understand the type of movement that occurs at a transform fault plate boundary.

E	108	TF	5685	50	<ul style="list-style-type: none"> Students did not understand the cause of deep earthquakes within the mantle; incorrectly answered that magma rising within the mantle causes deep earthquakes within the mantle.
E	109	MC	5686	42	*
E	110	MC	5678	65	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; incorrectly answered that oceanic-continental plate boundaries occur at ocean trenches, instead of subduction zones. Students likely did not refer to the data booklet; incorrectly answered that oceanic-oceanic plate boundaries occur at ocean trenches, instead of subduction zones.
E	111	MC	5691	56	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; answered incorrectly that the San Andreas Fault is a divergent plate boundary, instead of a transform plate boundary. Students likely did not refer to the data booklet; answered incorrectly that the San Andreas Fault is an oceanic-continental convergent plate boundary, instead of a transform plate boundary.
E	112	MC	5690	46	*
E	113	MC	5686	45	<ul style="list-style-type: none"> Students incorrectly answered that Plate Tectonic Theory was the first concept presented to the scientific community, not the Continental Drift Theory.
E	114	MC	5688	60	<ul style="list-style-type: none"> Students correctly answered that seafloor spreading and the location of volcanoes and earthquakes support the Theory of Plate Tectonics, but did not include matching fossil evidence and matching

					ancient rocks on adjacent continents.
E	115	MC	5684	32	<ul style="list-style-type: none"> Students analyzed a graph and correctly understood that the location should be underground, but incorrectly answered that the percent area of the Earth's crust was large to represent an ocean trench, not small.
E	116	MC	5688	44	<ul style="list-style-type: none"> Students incorrectly answered that an earthquake is most likely to give warning signs before occurring, allowing people to be safely evacuated, instead of a volcanic eruption.
F	88	MC	5526	28	*
F	89	TF	5524	36	<ul style="list-style-type: none"> Students incorrectly answered that most Cambrian fossils represent land-dwelling life forms; instead of aquatic life forms.
F	90	TF	5523	51	<ul style="list-style-type: none"> Students incorrectly answered that absolute age can be determined using volcanic rocks.
F	91	MC	5526	45	<ul style="list-style-type: none"> Students correctly answered that dinosaur bones preserved in sedimentary rock and shells preserved in sedimentary rock are fossils, but did not include insects preserved in amber, or footprints preserved in volcanic ash.
F	92	MC	5523	77	<ul style="list-style-type: none"> Students likely did not refer to the geological time scale in the data booklet; read an article and incorrectly answered that a coelacanth is Cretaceous in age, instead of Paleozoic. Students likely did not refer to the geological time scale in the data booklet; read an article and incorrectly answered that a statement about a coelacanth being Cretaceous in age was neither

					supported nor refuted by the article.
F	93	MC	5524	21	*
F	94	TF	5525	64	<ul style="list-style-type: none"> Students incorrectly answered that the date of construction of the pyramids can be determined from C-14 isotope dating of the fossils found within the rock.
F	95	MC	5513	52	<ul style="list-style-type: none"> Students interpreted a diagram and incorrectly answered that a rock layer was missing because it not deposited there, instead of the layer being eroded away.
F	96	MC	5520	55	<ul style="list-style-type: none"> Students did not understand how to apply the cross-cutting rule and the law of superposition to interpret a diagram of a cross-section of rock.
F	97	MC	5520	52	<ul style="list-style-type: none"> Students likely did not refer to the data booklet; did not understand how to use an isotope's half-life to analyze the age of a rock sample; incorrectly answered for two half-lives, instead of one.
F	98	MC	5518	42	<ul style="list-style-type: none"> Students correctly answered that the oldest fossil is in the middle of a folded rock layer, but incorrectly answered that the fold went up, not down.
F	99	MT	5500	63	<ul style="list-style-type: none"> Students did not understand the term "hot spot"; mistook a diagram of a hot spot for an island arc volcano. Students did not understand the term "hot spot"; mistook a diagram of a hot spot for magma rising.
F	100	MT	5520	36	<ul style="list-style-type: none"> Students did not understand the term "rising magma"; mistook a diagram of rising magma for a

					hot spot.
F	101	MT	5517	32	*
F	102	MT	5500	62	<ul style="list-style-type: none"> Students did not understand the term "island arc volcano"; mistook a diagram of an island arc volcano for a divergent plate boundary.
F	103	MT	5513	53	<ul style="list-style-type: none"> Students did not understand the term "divergent plate boundary"; mistook a diagram of a divergent plate boundary for a subduction zone.
F	104	TF	5515	37	<ul style="list-style-type: none"> Students incorrectly answered that ocean crust divergent plate boundaries are less common than continental crust divergent plate boundaries.
F	105	TF	5513	23	<ul style="list-style-type: none"> Students incorrectly answered that trenches are not caused by oceanic crust and lithosphere curving downward into the Earth at subduction zones.
F	106	TF	5522	26	<ul style="list-style-type: none"> Students incorrectly answered that oceanic crust does not sink at subduction zones.
F	107	TF	5525	54	<ul style="list-style-type: none"> Students incorrectly answered that the Juan de Fuca Plate will not increase the total surface area of the ocean floor because of the volcanic activity at the ridge, instead of it increasing the total surface area.
F	108	MC	5514	68	<ul style="list-style-type: none"> Students did not understand the term "remote sensing"; incorrectly answered that remote sensing was used to identify seafloor spreading, instead of magnetic surveys. Students did not understand the term "seismology"; incorrectly answered that seismology was used to identify seafloor spreading, instead of magnetic

					surveys.
F	109	MC	5514	37	*
F	110	MC	5493	29	*
F	111	MC	5524	61	<ul style="list-style-type: none"> Students incorrectly answered that the Mediterranean Sea will disappear and mountains will form as the continents collide, if the current plate boundaries continue to be active; chose the answer opposite to the movement of the plates.
F	112	MC	5519	59	<ul style="list-style-type: none"> Students did not understand that earthquakes occur very deep at subduction zones; incorrectly chose a diagram showing earthquakes occurring all below and above the subducted plate at a subduction zone.
F	113	MC	5513	73	<ul style="list-style-type: none"> Students incorrectly answered that the variation in the north-south orientation of the Hawaiian Ridge and Emperor Seamounts can be explained by the fact that new hot spots have erupted through the crust, northwest and then north. Students incorrectly answered that the variation in the north-south orientation of the Hawaiian Ridge and Emperor Seamounts can be explained by the fact that the hot spot moved south and then southeast.
F	114	MC	5517	54	<ul style="list-style-type: none"> Students correctly answered that a fossil found on several of the continents that were once connected and seeds that were too heavy to travel long distances in the air and too fragile to float across the water are evidence of continental drift, but incorrectly included that the fossil is older than the formation of Pangea, and did not include a fossil being the same age as Pangea, as further evidence. Students correctly answered that a fossil found on

					several of the continents that were once connected is evidence of continental drift, but incorrectly included that the fossil is older than the formation of Pangea, and did not include a fossil being the same age as Pangea, and seeds that were too heavy to travel long distances in the air and too fragile to float across the water as further evidence.
F	115	TF	5514	32	<ul style="list-style-type: none"> Students incorrectly answered that tectonic plate movements on the sea floor always generate tsunamis.
F	116	MC	5520	39	<ul style="list-style-type: none"> Students read an article and incorrectly answered that landslides put people at the greatest risk during the Bam earthquake, not falling objects.

Note: 'N/A' represents that there were fewer than 20% of the students who incorrectly answered the item; '*' represents that there was no specific curricular aspect that needed attention since each of the incorrect answers has been chosen by less than 20% of the students.