

## Top Thirteen Errors on the 2005 Grade 10 Science Provincial Exam

The following analysis was created from the Edudata Canada Science 10 Item Level report. There were three exams (A, B, C) for this exam period. Each exam was written by more than 10 000 students. The report can be found at <http://edudata.educ.ubc.ca>.

### Key

- 1) The number in the first column indicates the percentage of students who answered incorrectly for one of the three exam forms (additional numbers refer to the same question on different exam forms).
- 2) The second column describes the specific curricular aspect that needs attention.
- 3) The third column indicates the section reference from Science Foundations 10 that can be used to address this deficiency.
- 4) The fourth column provides suggested questions, figures or text from Science Foundations 10 that could be used to support the learning of the specific curricular aspect needing attention.

### LIFE SCIENCE

Percentage of Students who answered incorrectly	Specific Curricular Areas that Need Attention as noted by Edudata	Science Foundations 10 Section Reference	Science Foundations 10 Suggested text
80	Students correctly chose two functions of vacuoles, but answered that storage of nutrients was not a function	1.1.2	Pg. 11 1, 4b, 6b
63	Students did not understand that viruses cannot reproduce by mitosis. Students did not understand that viruses cannot reproduce on their own. Students did not understand the small size of viruses.	1.1.4	Pg. 18 Fig. 1.10 Pg. 19 2, 4, 5
72	Students confused the term “genotypic ratio” for “phenotypic ratio.”	2.1.2	Pg. 55 Study Prep

**PHYSICAL SCIENCE**

Percentage of Students who answered incorrectly	Specific Curricular Areas that Need Attention as noted by Edudata	Science Foundations 10 Section Reference	Science Foundations 10 Suggested text
71 x 3	Students correctly understood that, in an experiment of creating a charge by friction, the rod was neutral, but misunderstood the charge on a proton and the location of protons in an atom. Students understood that electrons move when creating a charge by friction, but did not make the connection that the rod being used was a conductor.	4.1.1	Pg. 140 1, 2, 3, 7
71	Students incorrectly added the total resistance and the total voltage, instead of dividing the total voltage by the total resistance.	4.2.1	Pg. 160 Quick Check
67 x 2	Students calculated the total voltage for a series connection instead of series-parallel connection of cells.	4.2.1	Pg. 160 – 161 Develop Your Skills
86	Students incorrectly answered that high voltage would overload a circuit, instead of low resistance.	4.2.2	Pg. 160 3, 4
70/69	Students answered using the formula for power instead of electrical energy. Students used the correct formula to calculate electrical energy, but did not convert time from hours into seconds. Students used the correct formula to calculate electrical energy, but incorrectly converted time into minutes instead of seconds.	4.4.1	Pg. 181 Study Prep Pg 182 3 Pg 183 5
68 x 2	Students incorrectly answered using the formula to calculate power, not energy; correctly multiplied voltage and current, but did not multiply the product by time. Students used the correct formula to calculate energy, but incorrectly answered using time in hours instead of seconds. Students used the correct formula to calculate energy, but incorrectly converted the time to minutes, not seconds.	4.4.1	Pg. 179 Study Prep Pg 182 4 Pg 183 6

**EARTH & SPACE SCIENCE**

Percentage of Students who answered incorrectly	Specific Curricular Areas that Need Attention as noted by Edudata	Science Foundations 10 Section Reference	Science Foundations 10 Suggested text
67 (66 & 68)	Students confused P-waves with surface waves. Students confused a seismogram with surface waves.	6.1.3	Pg. 231 Fig 6.6, Table 6.2 Pg 231A,B QuickCheck Pg 233 1, 2, 3, 4
70	Students likely did not refer to the data booklet; did not understand where ocean trenches are found.	6.3.2	Pg. 255 Fig 6.25, 6.26
69	Students likely did not refer to the data booklet; correctly answered for three of the boundaries, but incorrectly thought that mountains were found at one of the boundaries, not volcanoes. Students likely did not refer to the data booklet; correctly identified three of the plate boundaries in a cross-sectional diagram, but incorrectly thought that volcanoes were found at a fourth boundary.	6.3.2	Pg. 257 5, 7, 9
71 (71 & 73)	Students answered incorrectly that the Hawaiian Islands would not change or move over time. Students correctly answered that the Hawaiian Islands would erode, but chose the answer opposite to their movement. Students did not understand how hot spots and plate tectonics function together.	6.4.1	Pg. 259 Fig 6.31