

The TOPS Exams

Note to Applicants

The entrance examinations for the TOPS program are very difficult. The Mathematics examination is multiple choice and while 80% is based on the concepts of grade 7 and 8, these concepts are examined at a higher level than is typical in your school. The remaining 20% of the mathematics exam is based on concepts beyond grade 8. The science examination is a very challenging multiple choice test that evaluates the four major sciences: physics, biology, chemistry and astronomy. To excel on this examination you will have to read further in these subjects than is/was typically expected in your grade 7 or 8 classroom. The TOPS program is merit-based. It seeks to identify and then further train the most promising young scientific minds who apply. It is an opportunity for tremendous enrichment, but in doing so the students in the program will have to have already reached an advanced level of accomplishment on their own merits. In part, this will be identified on these examinations; hence their difficulty. Thank you for your interest in the TOPS Program. The application process for the 2012-2013 year is now over. Details of next year's application process will be made available online in early October.

Purpose of the Exams

Mathematics

The TOPS program is a very demanding academic program in the sciences, mathematics and English. We wish to ensure that a successful candidate is sufficiently prepared and of the ability level that would be indicative of success in the TOPS Program. Our senior TOPS mathematics courses are on par or more difficult than first university studies in calculus, algebra or statistics.

Science

TOPS is a science, mathematics and English focus program. While the government requires you to take only 1 senior (Grade 11 or 12) science course, TOPS requires you to take 5 senior science credits and many of our students take 7. We want to make sure that you have an abiding interest in science. The TOPS Science test is designed to measure your scientific ability as well as your interest.

English

The TOPS English essay, is designed to see how you think, how well you express yourself, perhaps even how willing you are to take a risk or two! It is an essay, but the topics are either word or photographic prompts. You will need to adapt

and to think on your feet. Non-electronic dictionaries are permitted.

Marking of the Exams

Science and Mathematics

Both of these exams are multiple choice. They are marked using a computer-based scanning system. You are identified on your scan sheet by a “TOPS ID Number” that will be issued to you on exam day. NOTE: On either exam there are 4 marks for a correct answer, one mark is deducted for an incorrect answer. If a question is left blank, then no marks are given. This practise is statistically fair in that someone who randomly guessed all questions would receive a grade close to zero.

English

ALL English exams are read by highly experienced educators who are also very familiar with the TOPS program. The cover page of the exam is removed and the candidate is identified only by their TOPS Identification Number. Therefore your name and elementary school is unknown to the person marking your English response.

Curriculum of the Exams

General Philosophy

Writing an admissions examination is a different matter than writing a test at school. Here we are attempting to measure typically a very able group of students. If many were get close to 100% for example, it would produce a result that is meaningless. How would we decide which student’s 100% is more impressive? Rather, we create a test that is in sum much harder than a standard school test that will ‘challenge’ even the best applicants. This then gives us a much better sense of the preparation and abilities of the applicant pool. Given the acceleration in mathematics that occurs in the TOPS program, it is essential that we make a fairly rigorous evaluation of a candidate’s mathematical literacy. Candidates whose current preparation is advanced (either in competence or content) for their grade will be thus rewarded.

Mathematics

This exam is based on five strands. Four of these are taken from the Ontario curriculum in Grade 7 and 8. Geometry, Algebra, Number Sense and Probability. We have created an additional strand of atypical questions that do not easily fit into one of the above 4 strands in the mathematics curriculum. Largely these concepts are beyond the elementary curriculum. In each strand, 7 questions were developed that

range in difficulty from comparatively easy to quite challenging. In the challenging questions, the concepts are still from this area, but are used in a more involved way than you might expect in a grade 7 or 8 math class. These questions are presented randomly on the exam paper so there is no “Geometry Section” for example. The fifth category is designed to reward students who have made the effort to accelerate their mathematical training. These questions deal with high school mathematical concepts such as: trigonometry, quadratic equations, sequences and series, exponentials, rational functions, elementary calculus and aspects of linear algebra. It should be said however, that no student has been denied entry explicitly due to a lack of background on advanced concepts. You might also say, “... but my math grade 8 math class has yet to cover one or more of these strands ...” This is true, in fact it will be true for everyone writing the test, so we feel this remains fair for all.

Science

The TOPS Science exam measures the interest and ability that candidates have in four core areas of science learning: Biology, Chemistry, Physics and Astronomy. While elementary students have not studied some of these sciences specifically, they certainly have studied aspects of them from a young age. In addition: there are three other strands woven across these concepts above: Data Interpretation, Scientific Terminology, Computations and Process. Furthermore, we would expect such motivated students to have augmented their science education with external resources such as: Internet, magazines, documentary programming and such like. We find that it is essential that students enjoy science given the amount of and the academic level of science they will be undertaking in the ensuing four years.