Interpreting and Using CogAT, NNAT and OLSAT Test Scores to Inform Instruction

Sample CogAT score report

Student Name			Age Scores		Grade Scores	
		SAS	PR	S	PR	S
Pretend, Peter	Verbal	120	89	8	89	8
	Quantitative	118	87	7	89	8
	Non-verbal	131	97	9	98	9
	Composite	126	95	8	96	9

The gifted programs at Hampton City Schools use **norm-referenced tests** such as the CogAT, NNAT, and OLSAT rather than **criterion-referenced tests** such as the SOLs to make eligibility decisions. The CogAT (Cognitive Abilities Test), NNAT (Naglieri Nonverbal Ability Test), and OLSAT (Otis-Lennon School Ability Test) are tests of critical thinking, reasoning, and problem solving; the SOL tests are tests of achievement in specific content areas such as science, writing or math.

Norm-referenced tests are made to compare test takers to a large group of others at the same age. On these tests, it is expected that some students will perform very well, most will perform at an average level, and a few will perform poorly. **Criterion-referenced tests** are intended to measure how well a person has learned the material taught in a specific grade or course. If the material is taught well, all test takers are expected to succeed. The Virginia Standards of Learning tests are criterion-referenced tests, and are not used in making gifted eligibility decisions. Both kinds of tests can provide helpful data for making instructional decisions to meet the needs of the students in the regular classroom.

Interpreting Scores

Stanine (S): A ranked comparison of students using a nine-point scale. Stanines 1, 2, and 3 are below average; stanines 4, 5, and 6 are average, and stanines 7, 8, and 9 are above average. Stanines 1 and 9 indicate the bottom and top 4 percent; stanine 5 is the middle 20 percent.

Percentile rank (PR): A point (score) on a scale of 100 that indicates the percent of scores at or below that point. *A student's score at the 84th percentile is regarded as equaling or surpassing that of 84 percent of the students in the group being tested. It does not mean that the student got 84 percent of the answers correct, but rather that the student performed better than 84 out of 100 students being tested.* Age-based and grade-based percentiles are often very similar, *except* if the student is significantly older or younger than other students in the same grade, as

might be expected if the student either had been retained or skipped a grade. The average range on the percentile rank is between the 25th and 75th percentiles.

Students who score between the 75th percentile and 85th percentile on their composite scores are in fact very bright students who have the capability of being very high achievers in a regular classroom. These students may need to be cluster grouped with other students who are also achieving at this level, and may need significant enrichment, advanced or differentiated instruction, and other instructional modifications to keep them challenged and motivated. These are critical thinkers who may become critical complainers if they become bored with repetitious work that they have already mastered. Students who score above the 85th percentile may be identified as gifted and placed in the gifted resource program, depending on the student's performance on the rest of the eligibility assessments. Since their time in gifted resource classes is, unfortunately, minimal, these students may also need advanced or differentiated instruction to keep them challenged and motivated. Students who have one or more subtest scores at or above the 95th percentile are generally very gifted students who are most frequently eligible for placement in the full-time gifted program at Spratley, again depending on the student's performance on the rest of the eligibility assessments.

Verbal subtest: measures verbal aptitude, word knowledge and concepts, facility with language, verbal reasoning, and analogies.
Students with high verbal scores can usually be expected to do well in reading and language activities. Since most classroom instruction and assignments are language-based, these students typically perform very well in the classroom on a daily basis. To support their advanced linguistic abilities, they may need to be provided with enrichment activities including advanced vocabulary, real-world writing, and a wide range of supplemental reading.
Students with low verbal scores may struggle with reading, writing, and other language-based activities. They may need supplemental instruction in vocabulary as well as in basic literacy skills.

Quantitative subtest: measures mathematical reasoning and problem solving, numerical sequences and patterns, manipulation of mathematical concepts.
Students with high quantitative scores usually do well with complex mathematical or numerical activities and concepts. Enrichment tasks should go beyond calculations and include mathematical thinking, explorations of advanced concepts, and real world problem solving (probability, codes, etc.).
Students with low quantitative scores may need supplemental instruction in basic math skills to achieve success.

Non-verbal subtest: measures reasoning and problem solving with patterns and relationships, pictorial analogies, and categories. This subtest is also helpful for obtaining an accurate assessment of the cognitive abilities of a student who may have limited proficiency in English or who has had limited opportunities to acquire verbal or quantitative knowledge. Students with high non-verbal scores can often be expected to do well with logic, models, creative thinking, constructions or building, technology, or other non-language based activities. Because the problem solving skills on the non-verbal subtest have little direct correlation to most reading, writing, and math instruction, students with high non-verbal scores who have strong aptitudes in

this area may not be easily recognized in the classroom. It is important to help these students continue to develop their verbal and quantitative skills, but also to find ways for them to apply their excellent non-verbal skills. Use a variety of graphic organizers and other pictorial ways for students to demonstrate learning (including thinking maps, diagrams, drawings, models, multimedia projects, etc.). Provide opportunities for creative problem solving, finding logical patterns and relationships, and use of high-level questions and critical thinking activities. Students with low non-verbal scores may just not have strengths in this area, OR may have had no previous exposure to pictorial problem solving and analogies, OR may be "out-thinking" themselves ("well, it could be this, but if you look at it that way, it could be this, or even this…"), OR have vision issues, OR may just not understand the tasks.

Composite score: A total or overall score. *A composite score is neither the sum nor the average of the subtest scores, but is computed separately*. Students with high composite scores often seem to be the traditional "gifted" students, with excellent skills in most areas. Students with high scores in one or two subtests may also be gifted, and may need differentiated instruction in their areas of strength. Low composite scores may indicate that the student will need more structure, time, and practice for learning effectively.

NNAT Score**:** The School Ability Index and Percentile Score on the NNAT are roughly equivalent to the composite score and composite percentile on the CogAT. This test is designed to be as culture-free and bias-free as possible, and can be helpful in identifying underserved populations of gifted students. Some students may score better on one test than on the other, which is why we administer two ability tests to each student—we want to get the most accurate picture possible of each student's capabilities.

Wide discrepancies between subtest scores: All subtests of the CogAT and OLSAT involve inductive and deductive thinking and reasoning, and require students to use problem-solving strategies. While specific subtest scores do give an indication of a student's relative strengths and weaknesses, particular attention should be paid to students who have wide variability in their subtest scores. Wide discrepancies between subtest scores may be caused by lack of English language skills, lack of certain numeracy skills, simple fatigue or hunger on test day, possible learning disabilities, lack of understanding of how to solve analogies, or even just errors in marking the test documents; however, **in many cases these discrepancies may also help to identify a student with very strong abilities who is just not performing well with traditional instruction.** Most importantly, identifying students whose predicted levels of achievement (high subtest scores) are considerably different from their observed levels of achievement (low classroom performance) is crucial in determining strategies to assist those students in achieving their potential.

An important note about unexpectedly low scores: The CogAT, NNAT, and OLSAT tests are timed tests, whereas the students are used to taking untimed benchmarks and SOL tests. Consequently we have found that some students, especially students who are determined to get everything correct, may get low scores on their ability tests simply because they worked slowly and meticulously and did not finish the test. If you suspect that a student should have done significantly better than his or her scores indicated, please refer the student for additional testing.

Summary

Along with SOL scores, CogAT, OLSAT, and NNAT scores can be used to guide or implement:

- Identifying at-risk students
- Identifying gifted students
- Guiding differentiation of instruction to support student strengths and weaknesses
- Clustering or flexible grouping for specific or supplemental instruction
- Determining the need for enrichment or remediation
- Finding relative strengths and weaknesses of the class as a whole as well as for individual students
- Counseling students
- **Identifying students whose predicted levels of achievement are considerably different from their observed levels of achievement**