



MINISTRY OF EDUCATION

What is the Grade Six Achievement Test (GSAT)?

The Grade Six Achievement Test (GSAT) forms part of the National Assessment Programme (NAP). The National Assessment Programme is comprised of the Grade One Individual Learning Profile, the Grade Three diagnostic Test, the Grade Four Literacy and Numeracy Tests and the Grade Six Achievement Test. The NAP is aimed at determining how students are learning at key stages throughout the primary level and their readiness to access secondary level education.

The GSAT is a curriculum-based examination. This means that the items on the examination match the objectives in the curriculum. The GSAT is based on materials covered in the Grade 4 to Grade 6 curriculum. The test is used to place students at the secondary level by the ranking of their overall performance on all subject areas tested. Table 1 below gives a break down of the structure of the GSAT.

Table 1: Structure of the GSAT

Subject	Type of Item	No. of Items	Value of Scale	Duration
Language Arts	Multiple Choice <i>Computer marked</i>	80 questions	1 Raw score <i>Scale 0-80</i>	75 mins
Mathematics	Multiple Choice <i>Computer marked</i>	80 questions	1 Raw score <i>Scale 0-80</i>	75 mins
Social Studies	Multiple Choice <i>Computer marked</i>	80 questions	1 Raw score <i>Scale 0-80</i>	75 mins
Science	Multiple Choice <i>Computer marked</i>	60 questions	1 Raw score <i>Scale 0-60</i>	60 mins
Communication Tasks	One Short Answer One Extended Writing <i>Specialized marking Team</i>	1 question 1 question	1 Raw score <i>Scale 0-12</i>	60 mins

Assessment Process

1.0 Registration

Registration for the examination begins in the month of October and closes in the month of November. There is a prescribed registration form to be completed by each student and signed by the parent/guardian. Students and parents select five schools in which they wish to be placed, in order of preference. As part of the registration process, parents are required to present the original or certified copy of child's birth certificate or the child's passport to the school. The registration form and the birth certificate are submitted to the Student Assessment Unit through the regional offices. Education Officers from the Student Assessment Unit visit the regional offices to verify the accuracy of the information presented on the registration form. If the forms are found to be improperly completed, requests are made for the correction to be done for final submission. Once the verification process is completed, birth certificates are returned to the principals for return to parents. Students' data is then processed and individual timetables are generated.

In order to sit the GSAT students should not be younger than 11 years nor older than 13 years at the time of the sitting.

2.0 The Test

The GSAT is curriculum-based and each test component is designed to cover the critical areas of the curriculum, both in terms of the scope and sequence of the content areas. Examinations are set to balance and account for, grade level, time allotted, volume of material and difficulty of material. As a loose general principle, curricula with wider content scope would require more items on a test to adequately cover the content scope than curricula with narrower content scope. Additionally, more difficult content would mean that fewer questions are placed on a test. As a result of these and other

psychometric considerations the number of items and therefore the relative value of each item between various tests will differ.

For example, Mathematics, Social Studies and Language Arts are marked on a scale of zero to eighty (0 - 80) with each item valued at one raw score. Science is marked on a scale of zero to sixty (0 – 60) with each item on the science test valued at 1 raw score. Communications task is marked on a subjective scale of zero to twelve (0 - 12) with two items, each valued at a maximum of six (6) raw scores. The science curriculum is narrow in scope and more challenging in terms of content and is therefore marked on a different scale from the other objective test.

The Communication Tasks tests the written aspect of the Language Curriculum. It tests the integration of the mechanics, content, and style of writing. It is a subjective test and is marked on a different scale.

3.0 Administration of the Test

The test is done over a two-day period under strict examination conditions. Each centre has an examiner and invigilators external to the school. Scripts are packaged and returned to the Ministry for marking and processing at the end of the test.

4.0 Marking Process

Data capture and scoring of all multiple choice examinations is done by computers. The Communication Tasks are marked by specially selected and trained teachers. As a safeguard, no teacher is allowed to mark scripts from any schools in the parish in which they live or work. Teachers selected to mark the Communication Tasks are required to sign a contract to ensure that confidentiality is maintained. Marking is done in a sterile environment at a central location. Markers work in groups, referred to as tables, each headed by a table leader who is required to ensure that there is consistency in the grading

of scripts. Scripts are second marked as part of the quality assurance process. Where there are concerns during the marking process, these are resolved by the table leader and the chief examiner.

Communications Tasks scores are recorded on a machine-readable form from which the data is captured, using a computer system, and then electronically merged with the data from the multiple choice examinations.

5.0 Scoring

The raw scores for the four multiple choice examinations are tallied by computer and merged with the Communication Tasks scores. These raw scores are then used to compute standard scores for each subject using a computer algorithm. Standard scores for each subject are summed to provide a composite score which is used to rank and place students.

Sixty percent of the Communication Tasks score is used in computing the composite score. This is referred to as weighting. The weighted score adjusts for the limited scale of zero to twelve (0 – 12) resulting from the narrow area of Language Curriculum covered by the Communication Tasks.

5.1 Standardizing Test Scores

For the GSAT, as previously stated, the subject scores are on different scales. This presents a challenge in combining scores to determine overall achievement, though this might not be immediately obvious. It is not simply a matter of adding or averaging all the percent scores together, or even adding all the raw scores of each subject. The raw scores on each test have different values relative to each other. Adding the score in Math with the score in Science and the score in Language Arts would amount to adding inches, metres and miles. This method is misleading as demonstrated in the example below.

Consider competitors in an endurance test consisting of three components; a 100 metre run, a 10 nautical mile swim and a 400 foot climb. The winner will be decided on the basis of distance covered.

From the average or total percentage of the endurance test (Table 2) it would appear that the Leader of the Opposition did the best. However that would be a statistically incorrect basis on which to award a prize for performance since the average and total percentage is influenced by the relative value of each point on the different scales. In this instance 1 nautical point is valued at 6,076.11 feet while one metre is valued at 3.28 feet.

Table 2: Endurance Test Raw

	Endurance Test Raw							
	Run 100 metres		Swim 10 Nautical Miles		Climb 400 feet		Average Percent	Total Percent
Scale	Metres	%	Miles	%	Feet	%		
Speaker	100	100%	7	70%	250	63%	77.66 %	233 %
Leader of the Opp.	100	100%	8	80%	250	63%	81.00 %	243 %
Prime Minister	50	50%	9	90%	350	88%	76.00 %	228 %

A more accurate way would be to convert all distances to a common unit or scale, in other words, standardise. For the endurance test let us use feet as the common or standard scale. Table 3 below provides the results of this standardisation. Standardisation reveals that the Prime Minister covered a greater distance overall and should be ranked in 1st place.

Table 3: Endurance Test Standardised

	Endurance Test Standardised						
	Run 100 metres		Swim 10 Nautical Miles		Climb 400 feet		Total distance
Scale	Feet	%	Feet	%	Feet	%	
Speaker	328.084	100%	42469.81	70%	250	63%	43,047.89
Leader of the Opp.	328.084	100%	48536.92	80%	250	63%	49,115.01
Prime Minister	164.042	50%	54604.04	90%	350	88%	55,118.08

Calculating Standard Scores

To parallel the Endurance Test example with an academic test example, let us examine an example of students sitting a test. For this purpose we will look at four students who sat Test A, Test B and Test C each having 25, 50 and 100 items respectively. The tables below represent the scores attained by these students. The first gives the raw scores and their equivalent percent scores, the type of test results most of reported.

Table 4: Student raw and percent test scores

	Test A		Test B		Test C	
	Raw	%	Raw	%	Raw	%
Student 1	12	48	40	80	70	70
Student 2	7	28	30	60	40	40
Student 3	20	80	45	90	91	91
Student 4	20	80	46	92	89	89
Mean	14.75	59	40.25	80.5	72.5	72.5
Standard Deviation	5.53963		6.339361		20.4756	

In addition to the raw scores two other critical pieces of information are required, the subject mean and standard deviation. The subject/population mean is that value computed by dividing the sum of the raw scores by the number of test takers. The standard deviation indicates the extent of dispersion for a group around the mean. Note that the population means (e.g. 14.75 for Test A) and the standard deviations (e.g. 5.53963 for Test A) are also included.

Statisticians also determine what the new scale should be before calculating the standard scores. They choose a standard scale mean and standard deviation for ease of calculations. For this example the standard scale mean will be 200 and the standard deviation 15.

Let us now compute the standard scores for these students.

Standard scores are computed in two steps:

- Converting raw scores to z-scores

$$\frac{\text{Raw score} - \text{Population mean}}{\text{Standard deviation}}$$

- Converting z-scores to standard scores

$$(\text{Z-score} \times \text{Standard scale standard deviation}) + \text{Standard scale mean}$$

Applying the above we will now compute the standard score of Student 1 on Test A.

Calculate Z-score by subtracting the population mean from the raw score and then dividing the result by the standard deviation, that is:

$$(12-14.75) / 5.53963 = -0.496423$$

Next, the **Z-score** is converted to the standard score by multiplying the Z-score by the agreed standard scale standard deviation of 15, then adding the mean of 100, that is:

$$(-0.496423 \times 15) + 100 = 92.55365$$

A similar computation is applied to each student's score for each paper, the results of which are in the table below.

Table 5: Student Z and standard test scores

	Test A		Test B		Test C		Composite Standard
	z	Standard	z	Standard	Z	Standard	
Student 1	-0.496423	92.55365	-0.03944	99.4085	-0.1221	98.1686	290.1307
Student 2	-1.39901	79.01484	-1.61688	75.7468	-1.58726	76.1912	230.9528
Student 3	0.9477167	114.21575	0.749287	111.2393	0.903515	113.5527	339.0078
Student 4	0.9477167	114.21575	0.907031	113.6055	0.805837	112.0876	339.9088

Note that in the case of Students 3 and 4, who would have had a tied average percent score of 87, their standards score are 639.0078 and 639.9088 respectively.

Standard scores are calculated for all the papers and summed to obtain the composite standard score. The composite standard score accurately represents students 1 to 4 overall performance on Tests A, B and C.

Why Standardise GSAT Scores?

Returning to the GSAT, standard scores are needed as:

1. the GSAT placement and scholarship processes requires that students be ranked on overall performance;
2. the papers differ, in that all subjects do not have the same number of items, i.e. are on different scales;
3. it is statistically unsound to add scores which are on different scales.

For the GSAT standard scale the mean is 100 and the standard deviation is 15. So, for example, the raw score mean on the Social Studies examination for 2008 of 42.92 becomes 100 on the standard scale and each raw score distance of 17.96 from the mean (Standard deviation) is represented by 15 on the standard scale. Let's calculate the standard scores for raw scores of 60 and 35 on this examination.

Raw Score 60

Formula :

$$100 + \frac{\text{Rawscore} - \text{mean}}{\text{StandardDeviation}} \times 15$$

Calculation :

$$100 + \frac{60 - 42.918}{17.959} \times 15$$

$$100 + (17.082/17.959) \times 15$$

$$100 + (0.9512 \times 15)$$

$$100 + 14.2675$$

$$= 114.2675$$

Raw Score 35

Formula :

$$100 + \frac{\text{Rawscore} - \text{mean}}{\text{StandardDeviation}} \times 15$$

Calculation :

$$100 + \frac{35 - 42.918}{17.959} \times 15$$

$$100 + (-7.918/17.959) \times 15$$

$$100 + (-0.4409 \times 15)$$

$$100 + -6.6134$$

$$= 93.3866$$

So a student with a raw score of 60 on the Social Studies paper gets a standard score of 114.2675 and another student with a raw score of 35 gets a standard score of 93.3866 on that paper.

A standard score indicates how far a particular score is from a test's average. The unit that tells the distance from the average is the standard deviation (sd) for that test. For the *GSAT* the mean is 100 and the standard deviation is 15. Standard Scores between -1 standard deviation (85) and +1 standard deviation (115) fall in the normal range on the ability being tested. Above + 1 standard deviation (115+) a student is in the top 15% of performances. Below -1 standard deviation (-85), she/he is in the lowest 15% of performances.

6.0 The GSAT Placement Mechanism

The Ministry recognizes that placement of *GSAT* students is one of the main areas of concern and anxiety among parents. It is with this in mind that this paper seeks to shed some light on the process of placement. As was mentioned in section 1.0 (Registration), students select five secondary schools and rank them in order of preference.

Inputs in Placement

1. Students' composite standard score

2. Students' choices
3. Available places for each secondary school, broken down by gender
4. Students' gender
5. Ministry's Proximity List: This list is compiled by officers in the different regions who have intimate knowledge of the location and proximity of sending schools in relation to receiving schools.

Placement Process

The GSAT placement is about 95% automatic, that is, approximately 95% of participating students are placed by computer. The process begins with the computerized ranking of students with the student attaining the highest composite standard score being ranked one (1) with each subsequent student, in descending order of performance, being assigned a rank, being the last rank incremented by one (1), until all students have been assigned a rank.

The same principle is used to place each student, starting with the highest rank. The student's school of first choice is checked for the availability of a space in which to place a student of this gender. If a place is available, the student is placed in that secondary school. If there is no place available, the process is repeated with the student's next preferred school. If all five preferences are exhausted, without being able to place the student, the process continues in the same manner, with each school on the MoE Proximity List.

If the computer is then unable to automatically place the child in a preferred school or one on the MoE Proximity List, the child is manually placed by MoE regional officers, whom possess an intimate knowledge of the schools under their jurisdiction. Typically approximately 5% of students are manually placed. This process is 'blind', with officers effecting the placements being given no indication as to the student's identity. All that is provided to officers are a randomly generated student number, and the school at which they sat the GSAT. They are placed in schools which have available spaces and which can cater to their needs.

One challenge faced by the process is the public perception that students are not ‘placed in a preferred school’. Upon examination of the system it becomes clear that the Ministry’s ability to place students in their preferred schools is dependent on the number of places available in each school, as well as the number of students selecting that school.

On completion of placement each year the process and its results are audited by the National Examination Committee chaired by Archdeacon Stone and comprising representatives from the Ministry of Education, Jamaica Teachers’ Association, Jamaica Council of Churches and the company contracted to process the examinations. The committee is provided with information on the processes used, challenges encountered and the results.

Release of GSAT data

Each year, the GSAT results are made available to schools and parents/guardians in the form of rounded percentage scores for each subject, together with the schools at which students have been placed. The Ministry’s permanent records would include all scores, raw, percent and standard, as well as placement data.

Since 2006, an electronic platform has been adopted for the release of result data, and this has enabled the Ministry to more easily and cost-effectively make more data available to stakeholders. Result data is typically released in June of each year.

7.0 Scholarships

7.1 Eligibility Criteria

Scholarships are generally awarded based on criteria set by donors or sponsors. Among the criteria are:

- Performance level
- Gender

- Location
 1. County
 2. Parish
 3. Inner-City
- Economic need
- Subject area
- Membership at:
 1. Financial Institutions
 2. Organizations/Groups (eg. Jamaica Civil Service Association, Blue Cross, JCF)

Scholarships are also awarded to students of particular schools through endowments or by philanthropic past-students. Example: Mable Downer Memorial Scholarship which is awarded to the top performer from the Watt Town All Age School.

7.2 Selection Process

No beneficiary of a Government Scholarship or a Bank of Nova Scotia Scholarship under the GSAT scheme may hold more than one scholarship award at any given time.

The computerized system used for placement of students would have already ranked all the students sitting the examination based on their **composite standard score** from the 1st to final candidate. Students who are to be considered for scholarship awards are therefore selected using the stipulated criteria and information from the database used for Ranking and Placement.

6.0 Appeals and Review Protocol

Existing Protocol

1. **Informal queries received by telephone or made orally by drop-in visitors:**
The staff member receiving the query responds, or directs the query to the relevant Head of Section. These queries usually relate to registration, examination and results dates, vacancies for raters, eligibility for the examination, and the curriculum.

2. **Queries from the Media:** These are usually referred to the SAU by the Communications Unit. The Manager of the SAU provides written responses or grants interviews.
3. **Requests for GSAT data:** The request must be presented in writing. Persons making the request complete a form specifying details of the request. The Manager of the Unit reviews the request and grants approval for the data to be generated. Persons making requests which are denied are so advised by telephone. Some persons requesting data are uncertain and sometimes unable to clearly articulate what they require. These persons are invited to consult with an Officer of the Unit to clarify the request.
4. **Requests made under the Access to Information Act:** These requests are usually forwarded to the SAU by the Director of Information, MOE. The SAU reviews the request, gathers and reviews the pertinent documents, and schedules an appointment through the Director of Information, with the person (s) requesting access.

Review of the Existing Appeals Protocol

We have decided to establish a Review Committee. This Committee consists of:

- A representative from the University of the West Indies
- A representative from the company contracted to process the examination results
- A representative from the Ministry of Education
- Public Defender?
- President of NPTA

Aggrieved parents/guardians may submit a written request through the Student Assessment Unit to the Committee.

NB: All requests/queries must be submitted to the Committee within ten (10) working days after the release of the scholarship/placement information.

7.0 Review of the Test

For the past 10 years, the GSAT component of the National Assessment Programme has been used as a placement mechanism. The test was piloted in 1996 in preparation for the replacement of the pass/fail Common Entrance Examination. The Ministry recognizes the need for continuous review of processes in order to ensure continued improvement in

standards and quality. As a result, a technical review of the test will be carried out. Particular focus will be given to the area of the marking scale for the Communications Task component and the Science component.