



Guidance on the appropriateness of the solution

Students of the information technology in a global society (ITGS) are expected to—in consultation with a specified client—design, create and implement an information technology (IT) product that meets the specific performance criteria in criterion B and the requirements for appropriateness in criterion E (see the *Updated internal assessment criteria—SL and HL*, March 2015). The following sub-sections provide guidance on developing products at the appropriate level that would be expected from an ITGS student.

The development of an IT product in ITGS is an activity that focuses on managing the relationship between the developer (the student) and client rather than the technical complexity and algorithmic thinking that underpins the product. The client needs to be involved in all stages of the process. The ITGS teacher must not be a client.

There are differences between the way the internal assessment is approached in ITGS and computer science, as highlighted in the following table.

ITGS	Computer science
ITGS is concerned with the development of IT systems, with particular emphasis on the effects on clients and end users.	Computer science is concerned with algorithmic thinking and the ways in which a real-world problem can be decomposed in order to construct a working, computable solution.

Before submitting their work for internal assessment, students must ensure that the copyrighted materials used in their product have met copyright requirements.

All resources used by the student to develop the product must be cited in criterion D and/or criterion E

The product developed in criterion E must be the same product as was planned in criterion D.

The list of techniques in the planning in criterion D should include those techniques that contribute, in a significant way, to the development of the product. The appropriate techniques highlighted in criterion E must be included in the table in criterion D.

The product must be submitted in the original format and in alternative, cross-platform formats wherever possible. For example, a desktop publishing (DTP) product developed with Adobe InDesign must be submitted both Adobe InDesign format and in Portable Document Format (PDF).

All projects will require a screencast that demonstrates the product functioning and that highlights the appropriate techniques identified at the beginning of criterion E. The screencast does not need to be edited and is not counted as an advanced technique.

In each of the following sub-topics, the table for each product type consists of the following two columns.

- **Basic**
- **Appropriate**

The items in the “Basic” column indicate techniques that may be used in the development of the product. However, they are not credited in the three appropriate techniques required in criterion E.

Appropriate techniques may be taken from any of the tables.

Multimedia

The project may be presented through a website, presentation, video, e-book or similar digital product. The contents (ie text, images, videos and similar elements) must be displayed using generally accepted standards for the particular type of multimedia.

Basic— not considered in criterion E	Appropriate (at least three appropriate techniques)— considered in criterion E
Navigation (internal and external links) Combining text and graphics Use of tables or layers for layout Use of headers, footers, watermarks or footnotes Manipulation of graphics involving simple techniques Six slides for a presentation	Proficient integration of the different elements of multimedia Non-simple editing of original sound Non-simple editing of video clips Creation of original animation Manipulation of graphics involving multiple techniques Links to underlying data (for example, through a database or mail merge) Navigation using frames and customized buttons Manipulation of codes such as HyperText Markup Language (HTML), Extensible Markup Language (XML), Java, JavaScript or Visual Basic to customize pages or improve functionality (see the “Code and programming tools” sub-section below) Cascading style sheets (CSS) or schema Integration of components using advanced features from other applications Quality content captured for video using special hardware/software (such as external microphone, tripod, lighting or other special equipment) Precise timing of the components in a video (such as audio, music or video footage)

Examples of suitable products could include:

- a website for a local photographer (client) to increase revenue (see example 1 in the “Internal assessment” section of the *Information technology in a global society teacher support material*)
- a video created for the Spanish teacher (client) to illustrate how Spanish is used in a particular city (see example 6 in the “Internal assessment” section of the *Information technology in a global society teacher support material*).

Products developed using web-based templates and Web 2.0 tools

Students must use techniques listed for other types of products to ensure the product includes at least three appropriate techniques. There are three ways to achieve this.

- The web-based template is used only as a “container” and all of the appropriate techniques achieved through the development of the “content” that is added to the “container”.
- The functionality of the “container”, template or the Web 2.0 tools has been extended through the use of code or other appropriate techniques.
- A combination of the above approaches.

For example, in a product a student may use one appropriate technique to modify the web-based template or Web 2.0 tools, one appropriate technique in creating a video and the third appropriate technique in developing a spreadsheet.

Basic— not considered in criterion E	Appropriate (at least three appropriate techniques)— considered in criterion E
Organization of template structure such as merging and splitting cells	Proficient integration of a range of different elements Use of editable sub-regions Use of code provided by the site Creation of original templates Integration of components using advanced features from other applications

Examples of suitable products could include:

- a Wikispaces website for a particular curriculum topic that allows students to contribute to the site (see example 2 in the “Internal assessment” section of the *Information technology in a global society teacher support material*)
- a blog made for the creativity, activity, service (CAS) coordinator to share successful CAS projects with the school community.

Desktop publishing (DTP) - MS Publisher, InDesign, Pages

The product may be presented through a desktop-published document. Ideally, it should have at least 12 pages.

Basic— not considered in criterion E	Appropriate (at least three appropriate techniques)— considered in criterion E
Combining text and graphics Use of tables for layout Use of headers, footers, watermarks or footnotes Single document of up to 12 pages	Manipulation of graphics to improve print quality Development of an original and unifying template Proficient use of typography Proficient interrelationship of graphical elements, images and text Links to underlying data (for example, through a database or mail merge) Integration of components using advanced features from other applications

An example of a suitable product could be a desktop-published booklet for a history teacher (client) to give to eighth-grade students (end users) when they visit Florence (see example 3 in the “Internal assessment” section of the *Information technology in a global society teacher support material*).

Relational databases

Students must not use a template that comes with the product. A flat file database is not an appropriate product.

Basic— not considered in criterion E	Appropriate (at least three appropriate techniques)— considered in criterion E
Simplistic use of forms, queries, macros, reports	At least three appropriately related tables Appropriate use of data validation, input masks Proficient integration of complex queries, calculated fields, forms, sub-forms, macros, and modules Structured Query Language (SQL) to develop a back-end database Proficient use of techniques to enable easy navigation (such as menus or buttons)

An example of a suitable product could be:

- a database for a local garage owner (client) to assist in the efficient ordering of parts (see example 4 in the “Internal assessment” section of the *Information technology in a global society teacher support material*).

Spreadsheets

Students must not use a template that comes with the product.

In general, a spreadsheet works better as a component of a larger product and not as a standalone ITGS product.

Basic— not considered in criterion E	Appropriate (at least three appropriate techniques)— considered in criterion E
Cell formatting Simplistic use of macros Charts Basic functions used in isolation (for example, IF, SUM, AVERAGE, MIN, MAX)	Multiple linked sheets Pivot tables, goal seek, scenarios Nested functions Proficient use of forms using customized macros Complex functions such as DATE, VLOOKUP, CONCATENATE

Code and programming tools

Students may wish to use programming tools as an appropriate technique to increase the functionality of a product or to actually create the product. Students must ensure there is an identified client for the product (in contrast to the computer science course, where the student may be the client).

It is recommended that products that are entirely programmed are only undertaken by students who have formally studied programming techniques. As some students may also be studying computer science, it is important to note they may not submit the same or similar work for two different Diploma Programme subjects or components.

Students should be reminded that all products that involve programming **must** provide both access to the code and to a functioning version of the product that the moderator can access **either** on the CD-ROM/ DVD **or** via the internet.

Moderators are **not** expected to download specialist software (such as NetBeans) to run the program

Basic— not considered in criterion E	Appropriate (at least three appropriate techniques)— considered in criterion E
Formatting of layout Templates Unedited code from third parties	Arrays File handling Sub-routines, parameter passing Loops, if-then, exit conditions Object definitions Graphical user interface (GUI)

Examples of suitable products could include:

- a spreadsheet or database with the use of code such as Visual Basic to increase functionality (see example 5 in the “Internal assessment” section of the *Information technology in a global society teacher support material*)
- a PHP website (front end) with an SQL database (back end).