Computer Science Curriculum for Schools

Model Curriculum and Teaching Material for K-12 Indian Schools

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Sri Sri Ravishankar Vidya Mandir (SSRVM)

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Abstract:

This curriculum is an attempt at defining the computer science syllabus for K-12 schools in the Indian educational system. It specifies (i) "what" should be taught in each standard, along with an attempt to explain "why" and (ii) "how" it should be taught, by giving sample lesson material and worksheets for each topic. The scope is currently limited to schools in urban areas and following the ICSE Board.

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SSRVM Curriculum, Computer Science, 2007 Edition

1 INTRODUCTION

Children today are exposed to a wide presence of computers (in homes and elsewhere). Their natural curiosity leads them to explore these “interesting toys”. They often learn on their own (or from friends, parents etc.) to use a computer for a variety of purposes. Sometimes this leads to learning undesirable habits (playing on a computer for hours), incorrect usage, as well as unsafe usage (ignorance of the risks in Internet access). Hence it is desirable for schools to introduce learning about computers as part of the curriculum itself.

Now it is necessary to take note of what computer usage is prevalent among children of a given age group and introduce those topics into the curriculum itself, in a suitable manner. Otherwise the school curriculum would lag behind the learning in other settings, leading to boredom, in addition to the dangers of incorrect/ignorant usage. Also, new computer-based tools and technologies are constantly finding their way into popular use. So it is necessary for the curriculum to be dynamic and adapt appropriately to the introduction of new tools, while simultaneously keeping a focus on conceptual learning. Moreover, there should not be emphasis on learning computers at the expense of other subjects/activities and the curriculum should be well-balanced. This document is an attempt at defining the details of what we believe is an appropriate, balanced curriculum for computer science in schools. We emphasize (i) learning of concepts associated with various tools, rather than just the usage skills of a specific tool and (ii) learning of more than one operating system/tool for doing a given task.

1.1 SSRVM Schools

The SSRVM (Sri Sri Ravishankar Vidya Mandir) group of schools is an initiative in value education. The goal is to provide stress-free education that enables children to blossom to their fullest potential; broaden the vision and deepen the roots. There are currently around 64 schools all over India and the goal is to establish many more. The SSRVM curriculum is based on the NCERT and ICSE syllabus.

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1.2 Scope of this curriculum

The scope of this curriculum includes defining the computer science syllabus for the SSRVM schools and creating the learning material (lesson outlines and worksheets) for each topic. The scope is currently limited to:

- Computer science as the subject.
- Standards K-12 in SSRVM schools in urban areas.
- Schools following the ICSE system.

The scope for this 2007 edition *does not include* teaching computer skills by integrating the use of computers into other subjects. The scope will later be expanded to include:

- E-learning: Using computer-based tools and applications to learn other subjects.
- Schools in rural and tribal areas in India.
- Schools following the CBSE and other State Board systems.

1.3 Curriculum Alternatives

A review of current K-12 computer science curricula being followed in India and abroad is given in Annex A. A summary is as follows:

- The CBSE Board follows the NCERT framework. The NCERT (National Council of Educational Research and Training) classifies the needs into 6 categories: Fundamental Operations and Concepts, Social and Ethical Issues, IT Tools, Communication Tools, Technology Research Tools and Problem Solving. At the end of each level: Primary, Middle and Secondary schools, some learning outcomes are prescribed. Currently, the detailing work is still ongoing.
- The ICSE Board has Computers as a core subject from 1st to 8th standard. In 9th and 10th standard it is an elective subject. The syllabus for 9th and 10th is defined and publicly available. Syllabus for the lower classes is left open. Schools are free to follow textbooks by any Publisher that they find suitable.
- State Boards have introduced the subject but many details are to be defined.
- Many schools abroad integrate the teaching of computers into other subjects. A well defined methodology for doing so is given in the recent ACM Task Force Report on a model curriculum to integrate CS/IT into the K-12 schools. Computer skills are learnt

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by carrying out projects and computer-based activities in other subjects. Such an integrated model is desirable but this approach is not yet suitable for Indian schools. Two key limiting factors are the lack of various resources and low computer skills among the teachers. Hence implementing a model similar to ACM, is not feasible.

- Due to lack of time, we only did some preliminary surveys of the curriculum being followed in developing nations. Nevertheless, given the diversity and specific conditions of the Indian context, we feel that simply adopting the curriculum from elsewhere, even after some modifications, is unlikely to work.

This document is an attempt towards addressing the question: *"What computer-related topics should be taught in each standard and why?*" especially in the Indian context.

1.4 Textbook Alternatives

A review of current textbooks available for computer teaching in Indian schools is given in Annex B. A summary is as follows:

- Books from many reputed textbook publishers, including Oxford, Jeevandeep, Kalra, Rachna Sagar, Navneet, Frank Bros and ILFS were studied.
- Most of the authors have attempted to provide a good, age-appropriate treatment of any given topic. Some of the books provide a good explanation for many topics. Most books provide good suggestions for activities but are often very specific to tools such MS Word, Excel. Many books have a lot of screenshots of the tools and insufficient emphasis on conceptual learning. In a few cases, it is not clear whether the book is meant to be read by the students or be used as a guide by the teacher.
- Moreover there is a wide variation in the interpretation of the syllabus leading to non-uniform emphasis. Even in a given textbook, the relative emphasis of the various topics is sometimes inappropriate. Sometimes the contents for an entire year deals with learning intricate details of one of the tools mentioned above. As a result, we did not find any to be consistently suitable, throughout the various standards and topics.
- Different schools seem to be following different books. Some do not follow any book but simply leave it to the teacher's creativity and resourcefulness to do the needful. As a result, there is a wide variation in the computer curriculum being taught, even among schools that are affiliated to the same Board.

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This document attempts a detailed specification of the computer science syllabus along with examples of the lesson material for each topic. It is hoped that these details will enable textbook authors to exercise their creativity in the explanation of a given topic, rather than the choice of the topics themselves. In other words, they should be free to focus on the "how to teach", rather than deal with "what to teach" and "why".

1.5 Basic Approach

The approach followed for designing this curriculum is:

1. Define what should be taught in each standard and **why.** This is done by identifying (i) the age-appropriate learning goals for each standard and (ii) the examination syllabus as given by the Affiliation Board (*ICSE, in this case*).
2. Create the contents (sample lesson plans and worksheets) for each sub-topic.
3. Conduct a rigorous review of the syllabus as well as the contents created. The main criteria for the syllabus review are *soundness and completeness*, while those for the contents review are *usefulness and child-friendliness*.

The computer curriculum for each standard is broadly divided into three groups:

1. **Concepts**: Learning computer science concepts that are generally useful in many areas as well as some concepts that are specific to computer usage/functioning.
2. **Usage Skills**: Developing hands-on skill in the use of various hardware/software and programming packages/languages.
3. **Social Aspects:** Understanding ethical and security related issues of computer and Internet usage.

1.6 Underlying Philosophy

The emphasis is on understanding the concepts behind various computer-based activities, rather than just the usage skills of specific tools. In higher classes, there is exposure to learning more than one operating system or tool for performing a given activity. Detailed lessons for hands-on laboratory exercises in using specific tools are also provided. It is hoped that such a concept-oriented approach will equip the children to be self-learners and enable them to cope with the inevitable advent of new tools and technologies of the future.

The design approach of this curriculum is to keep the primary section as elementary as possible, have a slight ramp up during middle school and further ramp up in secondary

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section to meet the syllabus prescribed for the Board exams. A summary is as follows:

- Primary Section (1st to 4th) – Get the children to be familiar with the computer and that it has many interesting uses. Introduce the capabilities of a standalone computer without doing any programming. Emphasis on just providing exposure to basic skills. Some elementary social aspects and the concept of logical, step-wise, thinking.
- Middle Section (5th to 7th) – Get the children to learn how to control the computer. Skilled use of a standalone computer, including configuration-level programming (change settings and customize applications). Introduce the power of Internet applications (email and search). Emphasis on social aspects – keeping oneself safe and ethical usage. Introduce an elementary programming language. Introduce general concepts behind some of the skills learnt, such as algorithms etc.
- Secondary Section (8th to 10th) – Full fledged control of the standalone system and skilled navigation of the networked world. Emphasis on learning concepts of broad applicability. Other topics of the syllabus, including using a programming language, as stipulated for the Board examination.
- Higher Secondary Section (11th to 12th) – Mostly follow the syllabus given for the Board examination. Highlight the underlying concepts, without over-doing it.

For the various topics, this syllabus follows the NCERT classification as far as possible. The group "**Concepts**" is broader than and includes the NCERT category of *Fundamental operations and concepts*. The group "**Usage Skills**" corresponds to the NCERT categories of *IT tools* (increase productivity), *Communication tools* (collaboration and publishing), *Technology research tools* (locate and collect information) and *Problem solving tools* (advanced uses of the computer). The group "**Social Aspects**" is the same as the NCERT category of *Social and Ethical issues*.

An emphasis is given to hands-on, laboratory work, wherever appropriate. As a result, any given topic can be classified along three axes:

1. The grade it is intended for (primary, middle or high school).
2. The group it belongs to (skills, social aspects or concepts).
3. The mode of its teaching (theory or lab).

1.7 Design Methodology

- For each standard, the syllabus is defined by giving the topics that should be taught

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(**"what"**), the reasons for doing so (**"why"**) & a schedule (**"how"**). See Section 2.

- For each topic, the detailed sub-topics that should be taught are defined by preparing a lesson outline for that topic. Some lessons may span multiple class periods. A lesson outline includes (i) a brief description of the topic and references for the teacher, (ii) a sample lesson plan that could be useful to the teacher, (iii) worksheets and activities to be done by the children and (iv) suggestions regarding evaluation and assessment. See Section 3.
- There is currently *no textbook* that can be directly used for this syllabus. It is hoped that these lesson outlines, along with some teacher training sessions, would be sufficient for each teacher to prepare his/her own lesson plans.
- A *creative commons* approach is used for generating the lessons and worksheets. All are welcome to participate in this effort. For each topic, detailed subtopics are listed; using which anyone interested can write the lesson outline. A template for doing so is given in Section 3. The lesson is then reviewed and after approval, may be incorporated into the curriculum. The author retains the rights over his/her work while at the same time allows others to use/modify it freely (without copyright issues).

1.8 Hardware/Software Platforms

The hardware resources required for each school are commonly available. During the lab, about 3 students may share each computer at a time. In case any special resources are required for a given topic, they are mentioned with the lesson outline.

The syllabus is agnostic of the software platforms and vendor-neutral. Lesson outlines are provided for both Windows XP and Linux Systems (Ubuntu). We believe that children should have exposure to both (similar to speaking more than one language). Either of them may be used for primary section but both are prescribed for secondary. Hardware specifications and software installation and maintenance guidelines are provided in Annex C, D and E.

1.9 Curriculum at a Glance

A high-level view of the curriculum is given in Tables 1(a), 1(b) and 1(c). These give a summary of the key topics included for the various sections. They show how the topics in each category (usage skills, social aspects and concepts) progress along the learning curve. The syllabus is elaborated in detail in the next section.

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Table 1(a): **Summary of Topics for Primary School Computer Science**

	Topic	1st Standard	2nd Standard	3rd Standard	4th Standard
Concepts		Parts of a computer; Uses of a computer; Notion of pointing and clicking on icons on the Desktop; Notion of a Dialog box.	Peripherals and their uses; More uses of a computer; Concept of Input/Output; File names; File permanence.	Being organized; Storage and directory structure; Hardcopy v/s Softcopy; Hardware v/s Software; Data v/s Program; Step-wise reasoning; Notion of programs.	Logical workflow in various activities; step-wise thinking; simple programs.
Skills	**Handling I/O Devices**	Simple usage of a mouse and a keyboard.	Special keys; Drag and drop; Insert a CD.	External media; CDs; PenDrive; Webcam.	Recording; Playback.
	User Interfaces	Changing Background; Moving windows around; Navigation within a window.	Multiple ways to create and save a file	Start Menu; Navigation within the computer;	Browser demo.
	File Manipulation	Opening and closing some files seen on the Desktop.	Create; Open; Edit; Save; Close; Copy; Rename; Delete.	Folders; sub-folders; nested hierarchies.	Managing a storage hierarchy; moving files around.
	Applications	Music Player; Paint; Games.	Music Player; Paint; Text Editor; Games.	Text Editor	Word processing; Making presentations;
	Activities	Open; Do something; Close.	Controls of a music player; Basic features of Paint; Enter some text into a file.	Common features of text processing; Using software from a CD.	Fonts; Formatting; Inserting objects;
Social Aspects		General carefulness; Do's and Don'ts	Operating precautions; Login/Logout	Login/Logout and privacy; Awareness of viruses;	Dangers of viruses etc.

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Table 1(b): **Summary of Topics for Middle School Computer Science**

	Topic	5th Standard	6th Standard	7th Standard
Concepts		Hardware functions; Tabulating data; Simple programs; Notion of networking; Using Help files; Internet Safety; Firewalls; Anti-virus; Updates.	Functions of an operating system; Drawing flowcharts; "Writing" a flowchart; Notion of syntax.	Structured programming notions; control flow; simple widely-used algorithms; Boolean logic and binary system; elementary computer and network architecture.
Skills	**System Handling**	First step to troubleshooting; checking connections.	Rebooting; passwords; closing non-responsive applications; control panel actions.	Install hardware/software; Multiple users; Automatic updates;
	Word Processing	Changing Background; Moving windows around; Navigation within a window.	Saving to different formats; Import/Export of files;	N/A
	Making Presentations	Templates; Fonts; Styles; Colours; Bullets; Organization.	Import/Export of objects; Master styles.	Animations; other useful stuff.
	Spreadsheets	Tables; Sorting; Summing.	Data filtering; functions; graphs.	Commonly useful features.
	Operating Systems	N/A	Introduction; Performing a known activity in Windows and Linux;	Continue use of both OS.
	Programming Language	N/A	Understanding syntax; Reading simple programs.	Writing simple programs (using BASIC); using a HTML editor.
	Internet	Elementary Browsing; Searching; Email.	Browser settings; Find Tools; Email attachments.	Find and download useful software.
	Security	Deleting spam emails.	Controls of a music player; Basic features of Paint; Enter some text into a file.	Common features of text processing; Using software from a CD.
Social Aspects		Internet Safety; Spam; Ethical use.	Internet and email ettiquette; Authentication; Ethical issues;	Copyright issues; Chat and email ettiquettte.

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	Topic	8th Standard	9th Standard	10th Standard
Concepts		Computer and Network architecture; Structured programming; Algorithms; Elementary operating systems, databases and networking.	**To be done**	**To be done**
Skills	**System Handling**	Basic troubleshooting;		
	Programming	Writing simple programs (BASIC). Web page design.	**To be done**	**To be done**
	Databases	Tables, keys, views, forms, query.		
	Internet	Connecting to Internet; How stuff works		
Social Aspects		Reinforce aspects learnt earlier; Online Transactions	**To be done**	**To be done**

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2 SYLLABUS

A high-level view of the syllabus is given earlier in Table 1. This section defines the next-level of details, using a "what-why-how" approach, i.e., the topics that should be taught, followed by the reasons for doing so, followed by a schedule and more details.

For each standard, a 32-week schedule is given. Week Nos. 1, 2 and 3 are reserved for revision of the previous Standard. Week Nos. 8, 15, 24 and 31 are for revision of the current Standard. Week Nos. 16 and 32 are reserved for evaluation and assessment. Assuming 10-weeks of vacation, there is still a 10-week buffer for the teacher. This can be used for giving more time to difficult topics, for additional revisions/evaluations and for **project work.**
Hence it is expected that a teacher would be able to comfortably complete the syllabus prescribed, by taking *one class per week for primary, one or two classes per week for middle school and two classes per week for secondary*.

2.1 1ST STANDARD

What: At the end of 1st Std, a child should know:

- *Concepts*: Regard the computer as a machine with various parts and associated functions (that can be controlled/directed).
- *Usage Skills*: Identify all the parts of a computer; use keyboard (arrow enter/return keys) and mouse (single/double click) as input devices; open applications, such as Music, Paint, or Games and their rudimentary use.
- *Social Aspects*: Maintaining cleanliness; dust-free area; not spilling food etc; orderliness in handling peripherals and sharing resources.

Why: At the end of 1st Std, it is enough for a child to be able to relate to a computer as an interesting entity with various parts and functions (Existence Awareness). More topics are not required because the goal is to simply introduce the computer as a tool for doing other tasks. Since it can be a highly distracting toy, the content is deliberately low-key. However, fewer topics are not desirable because the child should not get left behind in terms of his/her peers or get overwhelmed at a later age.

How: There should be one class per week, roughly as per the following schedule:

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Week	Topic	Lesson Number
1-1	Names of only basic parts of a computer.	
1-2	Worksheets related to parts of a computer. *Such as: analogy with the human body.*	
1-3	Demo of few interesting uses and applications. *Such as: listening to music, drawing pictures.*	
1-4	Demo of some more applications of interest. *Such as: watching videos, simple games.*	
1-5	Worksheets related to uses of a computer.	
1-6	General carefulness, including power switch on/off. *Such as: no banging on keyboard, no touching any wires, no direct switch off.*	
1-7	Worksheets related to above social aspects.	
1-8	**Revision worksheets and lab exercises.** *Objective up to this point: attract them to learn about computers.*	
1-9	Operating a Mouse: Single and Double click of the left button. *Such as: First attempts to position pointer; open any file/folder.*	
1-10	Operating a Keyboard: Letters and Enter key. *Such as: First attempts to write their names.*	
1-11	Worksheets and lab exercises related to mouse and keyboard.	
1-12	Notion of a cursor and positioning the mouse pointer. *Such as: Pointing to photographs in a photos folder.*	
1-13	Introduction to Desktop. *Such as: icons, background and windows.*	
1-14	Opening and closing some files seen on the Desktop. *Such as: double clicking on some music files or videos.*	
1-15	**Revision worksheets and lab exercises.** *Objective up to this point: minimal familiarity with mouse/keyboard.*	
1-16	**Evaluation and Assessment.**	
1-17	Elements of a Window: Top bar. *Such as: Minimize, Maximize and Close an open music file.*	
1-18	Open a Paint application and scribble something. *Such as: opening a file on desktop and just have some fun.*	
1-19	Notion of a dialog box. *Such as: While closing a Paint application after scribbling in it.*	
1-20	Open an existing Paint application, Edit and Save.	

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	Such as: Further scribbling in a previously saved file.
1-21	Worksheet on Open, Edit, Save and Close.
1-22	Elements of a Window: Tool Bar and Scroll bar. *Such as: Scrolling up/down an open file; opening a different file using the file tab.*
1-23	Open a Music player and then play a music file. *Such as: Click on the music player icon on Desktop, and then open a file.*
1-24	**Revision worksheets and lab exercises.** *Objective up to this point: simple actions with mouse.*
1-25	Operating a mouse: Right click. *Such as: Auto-arrange icons on the desktop.*
1-26	Change Desktop background and screen savers. *Such as: Right click, properties and just play. Children find this interesting.*
1-27	Operating a keyboard. *Such as: Arrows, Page Up/Down, Backspace/Delete keys.*
1-28	Open a game and play it. *Such as: A maze that needs some navigation using arrow keys.*
1-29	Navigate within any window using keyboard and mouse. *Such as: Any other simple game that needs some navigation.*
1-30	Social aspects: Further Do's and Don'ts. *Such as: Keep the computer and surroundings clean.*
1-31	**Revision worksheets and lab exercises.**
1-32	**Evaluation and Assessment.**

Comments: It is important to keep in mind that there may be significant variance in physical and mental development among the children. It is acceptable (and expected) if some children are not able to do all the activities completely. There is time for them to catch up in the 2nd Std.

2.2 2ND STANDARD

What: At the end of 2nd Std, a child should know:

- *Concepts*: Understand that different applications are used for different tasks; notion of response to commands; Input-Output.
- *Usage Skills*: Create, open, save, rename and delete files; different applications associated with different files/icons; familiarity with printer, CDs.
- *Social Aspects*: Care in handling of all computer accessories; sharing resources.

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Why: At the end of 2nd Std, a child should be familiar with the versatile uses and applications of a computer (Capability Awareness). The learning of the previous Std should be reinforced and those lagging behind would catch up. The same topics should be advanced to the next level of features. Introduce at most one new topic and concepts.

How: There should be one class per week, roughly as per the following schedule:

Week	Topic	Lesson Number
2-1	**Revision of parts of a computer learnt in 1st Std.**	
2-2	**Revision of interesting uses and applications learnt in 1st Std.**	
2-3	**Revision of social aspects learnt in 1st Std.**	
2-4	Functionality of additional parts and peripherals *Such as CD, printer and webcam.*	
2-5	Worksheets related to additional parts of a computer.	
2-6	Concept of Input and Output mechanisms and devices. *Notion of computer responding (Output) to a given command (Input).* *Categorize all the parts learnt so far.*	
2-7	Worksheets related to Input and Output concepts.	
2-8	**Revision of Mouse and Keyboard operations learnt in 1st Std.** *Objective up to this point: extra time for children to get familiar.*	
2-9	**Revision of using various applications learnt in 1st Std.** *Objective up to this point: extra time for children to get familiar.*	
2-10	Operating a Keyboard: Using numbers and special keys. *Such as: Shift, CAPS, Ctrl, ESC.*	
2-11	Operating a Mouse: Selecting objects; Drag and Drop. *Such as: Change the position of a file on the Desktop.*	
2-12	Worksheets and lab exercises related to mouse and keyboard.	
2-13	Using the basic controls of a Music player. *Such as: increase volume, seek etc.*	
2-14	Using the basic features of Paint software. *Such as: Draw objects using the drawing toolbar, colour palette.*	
2-15	**Revision worksheets and lab exercises.** *Objective up to this point: slightly advancing the 1st Std topics.*	
2-16	**Evaluation and Assessment.**	

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2-17	Introduction to additional uses of a computer. *Such as: text editor (Notepad), calculator (?).*
2-18	Insert and use of a CD in Auto-play mode. *Such as: audio or video or a game.*
2-19	Worksheets and lab exercises for additional uses.
2-20	Using the basic features of text editing software. *Such as: Typing 1-2 sentences in Notepad or equivalent.*
2-21	Open an existing document; edit, save and close it. *Such as: Repeat what they already know to do in Paint.*
2-22	Worksheets and lab exercises for text editing software.
2-23	Create a new document and save it. *Introduce concept of choosing appropriate names for files.* *Multiple ways to create files (Rt click or using tool bar).*
2-24	**Revision worksheets and lab exercises.** *Objective up to this point: introduce a new application and some common actions.*
2-25	Concepts of file permanence. *Such as: save a file, remember the name/location and open it later.*
2-26	Ways to save files (different locations, different names). *Such as: Same file contents saved with different names.*
2-27	Copy a file, Rename a file and Delete a file. *Such as: simply using mouse right click options.*
2-28	Worksheets and lab exercises for file management.
2-29	Login/Logout and concepts of privacy. *Such as: Login using preassigned id and password.*
2-30	Precautions while operating (deletion, shutdown etc). *Such as: No hasty action, especially for delete.*
2-31	**Revision worksheets and lab exercises.**
2-32	**Evaluation and Assessment.**

Comments:

If a school is just introducing computers but already has a child in the 2nd Std, then it is advisable to have 2 classes per week instead of one, just for one year. The 1st Std portion can be done in the first half of the year while the 2nd Std portion can be done in the second half of the year, without putting undue pressure on the children. From the next year onwards, the children can follow the regular schedule as prescribed.

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2.3 3RD STANDARD

What: At the end of 3rd Std, a child should know:

- *Concepts*: Hardware/Software; Hardcopy/Softcopy; Directory structure; information organization, storage and retrieval; Basic step-wise reasoning; Notion of a computer language.
- *Usage Skills*: Use of common peripherals; Using CDs and external media; Auto-installation of software (from CDs); file and folder manipulation; Use of common applications; Simple commands in LOGO.
- *Social Aspects*: Ethics, respecting other's privacy; preliminary security awareness.

Why: At the end of 3rd Std, a child should be able to find programs in a computer (Navigational Awareness). After a quick revision of the previous Std, the child should move to new topics and applications. Emphasis should be on systematic functioning & thinking. Some abstract concepts (data versus program) should begin to get included.

How: There should be one class per week, roughly as per the following schedule:

Week	Topic	Lesson Number
3-1	**Assessment of knowledge retained from 2nd Std portion.**	
3-2	**Revision of topics from 2nd Std based on above assessment.**	
3-3	**Revision of concepts from 2nd Std continued.**	
3-4	Using the common features of text processing. *Such as: undo; cut-copy-paste; font; using Notepad or equivalent*	
3-5	Worksheets and lab exercises for text processing.	
3-6	Concepts of storage and directory structure. *Such as: folders, sub-folders; nested structures.*	
3-7	Organizing data files. *Such as: Naming conventions; folder hierarchies.*	
3-8	**Revision worksheets and lab exercises for file/folder concepts.** *Objective up to this point: basic exposure to handling of files.*	
3-9	Concepts of hardcopy and softcopy. *Such as: Printing a file as well as having it on the computer.*	
3-10	Using external media such as CDs and Pen Drives. *Such as: Reading from a CD; Writing to a Pen Drive.*	

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3-11	Worksheets and exercises for moving files to/from external media.
3-12	Start Menu: Navigation and finding applications of interest. *Such as: Launching MusicPlayer/Paint/Notepad from the Start Menu.*
3-13	Navigation within the computer (locating files and programs). *Such as: by looking into various sub-folders (using 'folders' view?)*
3-14	Worksheets for navigation in the computer.
3-15	**Revision worksheets and lab exercises.** *Objective up to this point: continue with handling of files.*
3-16	**Evaluation and Assessment.**
3-17	Using multimedia hardware and software such as Webcam. *Such as: Take your own photo using a pre-configured webcam.*
3-18	Concept of hardware versus software. *Such as: Webcam/Printer versus their controlling software*
3-19	Worksheets and lab exercises for above lessons.
3-20	Installation of software from a CD and its use. *Such as: by using the auto-install Wizard inbuilt into a game/lesson CD.*
3-21	Using some interactive educational programs from a CD. *Such as: from BBC or Discovery?*
3-22	Login/Logout and concepts of privacy. *Such as: password protection and access to each others' files.*
3-23	Awareness of viruses and malicious software. *Such as: Never click OK to anything that you don't understand.*
3-24	**Revision worksheets and lab exercises.** *Objective up to this point: move from handling text files to multimedia.*
3-25	Concept of step-wise reasoning, in general terms. *Such as: steps in going to market and buying a toy.*
3-26	Worksheets to show reasoning in various activities.
3-27	Concept of data versus program. *Such as: text entry versus text editor.*
3-28	Concept of simple programming. *Such as: Detailing out the steps involved in any activity.*
3-29	Notion of using a language for programming. *Such as: need for keywords for specific actions (ex. Do 10 times)*
3-30	Demo of some simple language commands. *Such as: using LOGO.*

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3-31	**Revision worksheets and lab exercises.**
3-32	**Evaluation and Assessment.**

Comments:

If a school is just introducing computers but already has a child in the 3rd Std, then it is necessary to have 2 classes per week instead of one, for one year. The 1st Std portion can be done in the first quarter of the year while the 2nd Std portion can be done in the second quarter of the year, since the children would have the ability to quickly grasp these topics. The 3rd Std portion can be done in the third and fourth quarters of the year, at a normal pace by using 2 classes per week. From the next year onwards, the children can follow the regular schedule as prescribed.

2.4 4TH STANDARD

What: At the end of 4th Std, a child should know:

- *Concepts*: Information handling; Workflow notions; Keywords (Syntax).
- *Usage Skills*: Using common devices and applications; Information handling and movement of data between different storage areas; Word processing and elementary making of slides; rudimentary programming (using a language like LOGO).
- *Social Aspects*: Awareness of computer-usage posture, eye-care; Keeping the computer safe from malicious use; Ethical issues?

Why: At the end of 4th Std, a child should be able to find the necessary information to carry out simple tasks using the computer. The child should be able to configure, customize programs (Control Awareness). A child should be equipped to independently learn the preliminary use of common applications.

How: There should be one class per week, roughly as per the following schedule:

Week	Topic	Lesson Number
4-1	**Assessment of knowledge retained from 3rd Std portion.**	
4-2	**Revision of topics from 3rd Std based on above assessment.**	
4-3	**Revision of concepts from 3rd Std continued.**	
4-4	Additional features in Word processing. *Such as: fonts, formatting and other commonly used ones.*	

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4-5	Advanced features of Word processing. *Such as: inserting pictures/objects, making tables.*
4-6	Worksheets and lab exercises for Word processing.
4-7	Simple introduction to making Presentations. *Such as: Open a Presentation software, write text in one slide.*
4-8	**Revision worksheets and lab exercises.** *Objective up to this point: extend text processing and introduce one new topic.*
4-9	Concept of making slides and logical flow from one to the next. *Such as: Four slides on what they do in a typical day; slide show.*
4-10	Worksheets and lab exercises for fun with Presentations.
4-11	Concepts of workflow. *Such as: similar to a slide show on any activity.*
4-12	Worksheets for illustrating workflow concepts.
4-13	Recording an audio file, store and playback. *Such as: Using mic/webcam to capture voice/images.*
4-14	Inserting audio/video into a presentation. *Such as: Including a voice clip in a presentation on "myself".*
4-15	**Revision worksheets and lab exercises.** *Objective up to this point: continue on the topic and introduce a new concept.*
4-16	**Evaluation and Assessment.**
4-17	Organizing a storage hierarchy (creating folders etc). *Such as: keeping all related files in a sub-folder.*
4-18	Managing a storage hierarchy (moving files around). *Such as: Moving files between folders using copy-paste, drag-drop.*
4-19	Worksheets and exercises for organization.
4-20	Reinforce concepts of step-wise logical thinking. *Such as: Those learnt in 3rd Std.*
4-21	Worksheets to show steps for various activities.
4-22	Concepts of simple programming. *Such as: Need for detailing steps, use of keywords.*
4-23	Simple programming with a language like LOGO. *Such as: using the most elementary commands.*
4-24	**Revision worksheets and lab exercises.** *Objective up to this point: continue on the concept of organized thinking.*

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4-25	Continue with simple programming. *Such as: commonly used commands in a language like LOGO.*
4-26	Worksheets and lab exercises for programming.
4-27	Evolution/History of computers *Such as: story to set the stage for networked applications.*
4-28	Internet applications (demo only; *no hands-on*). *Such as: Google; Email (demo only).*
4-29	Further Do's and Don'ts *Such as: Posture and Eye care.*
4-30	Reinforce the safety aspects. *Such as: Dangers of Viruses and malicious intent.*
4-31	**Revision worksheets and lab exercises.**
4-32	**Evaluation and Assessment.**

Comments:

If a school is just introducing computers but already has a child in the 4th Std, then it is mandatory to have 2 classes per week instead of one, at least for one year. The 1st and 2nd Std portions can be done in the first half of the year. The 3rd Std portion can begin in the second quarter of the year and should be completed by the fourth quarter. The 4th Std portion should be taken up in the fourth quarter, *at a normal pace.* The portion can overflow to the first half of the next year (5th Std for these children) and then follow the regular schedule as prescribed.

At the end of Primary, a child should be proficient in the following: Operating computers and peripherals; Using multimedia and applications such as word processing; Exposure to making presentations; Awareness of privacy and security; Ability to take precautions; logical thinking and elementary programming.

Internet applications such as email and search, are not introduced in primary since it is important that a child be able to first understand the safety aspects thoroughly.

(Note to Reviewers: Pls help to identify the key "concepts" in CS that are worth introducing at a primary level itself.)

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2.5 5th STANDARD

What: At the end of 5th Std, a child should know:

- *Concepts*: Tabulating data; simple programs; Network-related concepts such as message exchange between computers; Security concepts of filters and firewalls.
- *Usage Skills*: Understanding some hardware functions [CPU, Disk], networking; Connecting to Internet; browsers; e-mail; search engines; Office applications.
- *Social Aspects*: Careful use of Internet; Recognize and avoid potential dangerous actions, such as opening spam mail, downloading/installing arbitrary programs.

Why: At the end of 5th Std, a child should be able to competently use common programs. Emphasis should shift from just learning how to use a tool to the underlying concepts. For example, simple concepts of searching/sorting should be introduced while learning to use a spreadsheet tool. *Introduction of Internet cannot be further deferred;* otherwise they may learn incorrect usage from elsewhere. There should be a major emphasis on security and safety aspects before they move to unsupervised use.

How: There should be one or more classes per week, as per the following schedule:

Week	Topic	Lesson Number
5-1	**Assessment of knowledge retained from 4th Std portion.**	
5-2	**Revision of topics from 4th Std based on above assessment.**	
5-3	**Revision of concepts from 4th Std continued.**	
5-4	Understanding hardware: Functions of CPU, Memory, Disk. *Such as: using extremely simple language.*	
5-5	Worksheets to understand hardware and system functions.	
5-6	Basic troubleshooting: Check speaker connections, Task manager. *Such as: Inspect wires, Close non-responsive programs.* *Also extend keyboard skills to include pressing 2 keys simultaneously.*	
5-7	Worksheets and exercises for troubleshooting.	
5-8	**Revision worksheets and lab exercises.** *Objective up to this point: Revision and venture into basic troubleshooting.*	
5-9	Capabilities of Presentation software. *Such as: templates, fonts, styles, colours, bullets and sub-bullets.*	
5-10	Organizing a presentation.	

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	Such as: Moving slides around, different views, hiding etc.
5-11	Worksheets and exercises for making presentations.
5-12	Using Help files and documentation for familiar applications. *Such as: Finding out how to change the bullet style.* *Introduce that documentation exists and may be useful.*
5-13	Worksheets and lab exercises for using Help files.
5-14	Simple introduction to Spreadsheets. *Such as: useful for making a table.*
5-15	**Revision worksheets and lab exercises.** *Objective up to this point: Continue presentations and introduce spreadsheets.*
5-16	**Evaluation and Assessment.**
5-17	Spreadsheets as a database (sorting on different columns). *Such as: sort by name, sort by age, sort by roll number.* *Demonstrate a couple of times and let them figure out by themselves.*
5-18	Spreadsheets as a calculator (mathematical functions). *Such as: average, sum, defining formulae for a row/column of entries.*
5-19	Worksheets and lab exercises with Spreadsheets.
5-20	Concepts of simple programming *Such as: Maths using LOGO.*
5-21	Worksheets on simple programming.
5-22	Internet applications demo: Browsing, Searching, Email etc. *Such as: Repeat demo from 4th Std and move ahead.*
5-23	Concepts of networking computers. *Such as: Notion of one computer being able to talk to another.*
5-24	**Revision worksheets and lab exercises.** *Objective up to this point: Wrap up standalone applications and start Internet.*
5-25	Internet access using a Browser. *Such as: opening a link, bookmarks, Search Engine.*
5-26	Internet search engines and their use. *Such as: Basics of keyword combinations and looking up results.*
5-27	Introduction to email applications, and managing email. *Such as: Create an email id; Write a short message to your friend.* *Such as: Check mail; delete mail; manage inbox; folders (?).*
5-28	Worksheets and lab exercises for Internet access.
5-29	Internet safety: Firewalls, Anti-virus, Automatic updates.

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	Such as: Show firewall and anti-virus installed on the machine. *Introduce the necessity of keeping these updated continuously.*
5-30	Worksheets and exercises for Internet safety. *Also include: Handling spam and reinforcing security and ethical issues.* *Such as: Never open a mail from unknown. Do not send abusive mails/postings.*
5-31	**Revision worksheets and lab exercises.**
5-32	**Evaluation and Assessment.**

Comments:

If a school is just introducing computers but already has a child in the 5th Std, then only the Primary syllabus should be done in that year. The syllabus for both 5th and 6th Std may be done in the next year, using some additional classes per week. The emphasis should be on broad understanding of various features rather than specific details.

2.6 6th STANDARD

What: At the end of 6th Std, a child should know:

- *Concepts*: Perform same activity using different applications and/or operating systems. Different functions of an operating system. Sequential program execution; Syntax and structured logic.
- *Usage Skills*: Exposure to different operating systems and tools for the same activity. Some advanced features of familiar applications, such as incorporating tables and pictures in slides; setting homepages in browsers, blocking pop-ups; Elementary system administration of a single-user machine (changing display resolution; using all features of the control panel). Introductory programming – Using BASIC.
- *Social Aspects*: Increased awareness of security; sharing photos or personal information over email.

Why: At the end of 6th Std, a child should be able to distinguish between an activity and the tools used for perform it; It is desirable to provide exposure to more than one operating system or more than one application for an activity. Notion of different programming languages should be introduced, to avoid a sudden exposure in the later standards. Emphasis on security and safety aspects of Internet usage should continue.

How: There should be one or more classes per week, as per the following schedule:

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Week	Topic	Lesson Number
6-1	**Assessment of knowledge retained from 5th Std portion.**	
6-2	**Revision of topics from 5th Std based on above assessment.**	
6-3	**Revision of concepts from 5th Std continued.**	
6-4	Introduction to Operating Systems. *Such as: Difference between OS and Desktop.*	
6-5	Worksheets to understand operating system functions.	
6-6	Elementary administration of a standalone system. *Such as: rebooting; passwords, setting time; closing non-responsive applications*	
6-7	Continuing with administration of a standalone system. *Such as: Control panel type activities; change various settings.*	
6-8	**Revision worksheets and lab exercises.** *Objective up to this point: learning to manage one's environment.*	
6-9	Performing a given activity in Windows AND Linux. *Such as: Repeat two activities learnt in 5th (Browsing/Editing) in the other OS.*	
6-10	Continuing with performing a given activity in both OS. *Such as: using media players, making presentations etc.*	
6-11	Worksheets and exercises for mapping between OS.	
6-12	Advanced features in Word processing (in both the OS). *Such as: saving to different formats; import/export of files.*	
6-13	Advanced features in making Presentations (in both OS). *Such as: Import/export of objects; master styles etc.*	
6-14	Advanced features in Spreadsheets (in both OS). *Such as: Data filtering, functions and graphs.*	
6-15	**Revision worksheets and lab exercises.** *Objective up to this point: learning that there are multiple options.*	
6-16	**Evaluation and Assessment.**	
6-17	Concept of drawing flowcharts for non-programming tasks. *Such as: Entry; Step; Branch; Loop; Exit.*	
6-18	Worksheets for drawing flowcharts.	
6-19	Concept of "writing" a flowchart using keywords. *Such as: Using keywords (if-then-else) instead of drawing flowchart steps.*	
6-20	Worksheets for writing a flowchart. *Such as: Pseudo-code (in English) for non-programming tasks.*	
6-21	Concept of syntax and structured logic (using BASIC).	

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	Such as: computer understands only specific keywords instead of English.
6-22	Worksheets for 'reading' ability in a programming language.
6-23	Simple 'writing' ability in programming (using BASIC). *Such as: Using syntax for earlier pseudo-code.*
6-24	**Revision worksheets and lab exercises.** *Objective up to this point: notion of structured thinking and syntax.*
6-25	Additional features in Browsers. *Such as: settings – text size, home page etc.*
6-26	Exercises for Browser features (using both operating systems).
6-27	Using Find tools on a computer and effective Internet search. *Such as: search for specific types of files; pattern matching using wildcards.* *Downloads and dealing with information overload.*
6-28	Worksheets and lab exercises for search related activity.
6-29	Advanced email and Internet etiquette. *Such as: Upload/View attachments. Politeness; maintaining address books.*
6-30	Reinforce authentication, safety and ethical issues in Internet access.
6-31	**Revision worksheets and lab exercises.**
6-32	**Evaluation and Assessment.**

Comments:

Since the features of applications change over a period of time, it is not advisable to be too specific or rigid in this respect. As long as a child is aware of the commonly used features and is able to navigate and find how to use them when required, it is sufficient. The emphasis should be on a broad understanding rather than advanced details. Focus on concepts is important to equip a child to explore, find and learn to use new applications on his/her own.

2.7 7TH STANDARD

What: At the end of 7th Std, a child should know:

- *Concepts*: Architecture such as CPU and Memory working together to accomplish an instruction; Concepts of Boolean logic and Binary arithmetic; Structured programming; Constants and variables; Branching and Looping; simple algorithms; Network architecture such as simple understanding of some protocols.
- *Usage Skills*: Set up of printers/scanners and installation of device drivers; Advanced

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features of familiar applications, such as incorporating tables and pictures in slides; Data sorting/filtering, generating graphs; Adding animation in presentations; browser settings customization settings; Creating simple web-pages using authoring tools; Chat; Simple Programming – Using BASIC.

- *Social Aspects*: Reinforce the importance of security and etiquette in chat rooms or in groups like Orkut; Copyright and piracy awareness.

Why: At the end of 7th Std, a child should be able to use some applications and Internet with some competence. A child should be able to write simple structured programs.

How: There should be one or more classes per week, as per the following schedule:

Week	Topic	Lesson Number
7-1	**Assessment of knowledge retained from 6th Std portion.**	
7-2	**Revision of topics from 6th Std based on above assessment.**	
7-3	**Revision of concepts from 6th Std continued.**	
7-4	Setup and administration of a standalone system. *Such as: Install and Uninstall hardware and software; backup and restore.*	
7-5	Worksheets and exercises for system administration.	
7-6	Administration of both Windows and Linux systems. *Such as: Multiple users, automatic updates of software, etc.*	
7-7	Worksheets and exercises for system administration.	
7-8	**Revision worksheets and lab exercises.** *Objective up to this point: independent, competent control of an individual machine.*	
7-9	Advanced features in Presentations/Spreadsheets. *Such as: Animations and useful features not covered earlier.*	
7-10	Exercises in using advanced features in Presentations/Spreadsheets.	
7-11	Structured programming concepts. *Such as: use of constants and variables, assignment statement.*	
7-12	Structured programming continued. *Such as: control flow statements; branching; looping.*	
7-13	Writing simple programs. *Such as: Add any two given numbers.*	
7-14	Worksheets on writing simple programs.	
7-15	**Revision worksheets and lab exercises.**	

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	Objective up to this point: Provide sound foundation in logical thinking.
7-16	**Evaluation and Assessment.**
7-17	Study some simple widely useful algorithms. *Such as: Elementary sorting/searching techniques.*
7-18	Exercises to program the algorithms (using BASIC?).
7-19	Concepts of Boolean logic and Binary system. *Such as: AND, OR, TRUE/FALSE.*
7-20	Worksheets to understand basics of Binary system.
7-21	Elementary computer architecture. *Such as: Interactions between CPU, Memory, Disk etc.*
7-22	Elementary network architecture. *Such as: Existence of Routers.*
7-23	Worksheets to understand computer and network architecture.
7-24	**Revision worksheets and lab exercises.** *Objective up to this point: Provide some idea of internal workings.*
7-25	Network related concepts. *Such as: Message exchange protocols.*
7-26	Find, download and install free and open source software. *Such as: Games, Typing tutor.*
7-27	Understanding copyright issues. *Such as: Difference between free and licensed software; piracy.*
7-28	Creating simple web pages using HTML editors. *Such as: About yourself.*
7-29	Exercises for Browser features and HTML.
7-30	Internet Chat and email etiquette. Such as: Do not spam; do not flame;
7-31	**Revision worksheets and lab exercises.**
7-32	**Evaluation and Assessment.**

Comments:

The emphasis should not be on simply using applications. It should move towards understanding the concepts behind how various applications work.

(Note to Reviewers: Pls help to identify the key "concepts" in CS that are worth introducing at a middle school level.)

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2.8 8TH STANDARD

What: At the end of 8th Std, a child should know:

- *Concepts*: Simple understanding of architecture, operating systems, algorithms, databases, networks; How stuff works, mail, hyperlink; Resident program v/s network access.
- *Usage Skills*:
  - Hardware – Elementary troubleshooting (connectors and drivers).
  - Software – Database software; Creating web-pages using HTML editors.
  - Programming – Structured programming (using BASIC).
- *Social Aspects*: Understanding of online transactions and importance of security.

Why: At the end of 8th Std, a child should be able to use most applications and Internet with reasonable competence. A child should be able to write simple structured programs. Most of the topics learnt earlier are to be reinforced towards the 9th and 10th Std syllabus given by the Board.

How: There should be two or more classes per week, as per the following schedule:

Week	Topic	Lesson Number
8-1	**Assessment of knowledge retained from 7th Std portion.**	
8-2	**Revision of topics from 7th Std based on above assessment.**	
8-3	**Revision of concepts from 7th Std continued.**	
8-4	Computer architecture and elementary hardware troubleshooting. *Such as: Check connections, drivers.*	
8-5	Worksheets to understand architecture and troubleshooting functions.	
8-6	Network architecture and mechanisms for connecting to the Internet *Such as: Dial up; Broadband.*	
8-7	Worksheets to understand network architecture.	
8-8	**Revision worksheets and lab exercises.** *Objective up to this point: Provide more idea of internal workings.*	
8-9	Reinforce structured programming concepts. *Such as: Slightly advance the concepts taught earlier.*	
8-10	Reinforce concepts in algorithms. *Such as: Slightly advance the concepts taught earlier.*	

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8-11	Programming exercises (using BASIC).
8-12	Programming exercises (using BASIC).
8-13	Elementary concepts in databases. *Such as: Tables, keys, views, forms and query.*
8-14	Simple exercises for use of a database application. *Such as: Create a database of academic records.*
8-15	**Revision worksheets and lab exercises.** *Objective up to this point: Prepare them for the programming in 9th Std.*
8-16	**Evaluation and Assessment.**
8-17	Elementary concepts in operating systems. *Such as: Scheduling; Resource sharing, Producer-consumer, etc.*
8-18	Worksheets to understand operating systems.
8-19	Concepts of remote access over a network. *Such as: Running an application on a remote computer versus a resident program.*
8-20	Elementary concepts of networking protocols. *Such as: Multiplexing, Shared access, client-server, etc.*
8-21	Worksheets to understand networking protocols.
8-22	Advanced web page design. *Such as: Fancy stuff using HTML editors.*
8-23	Exercises for web page design.
8-24	**Revision worksheets and lab exercises.** *Objective up to this point: Introduce some fundamental concepts and have some fun.*
8-25	General exposure to 'interesting' technologies. *Such as: How email works? How mobiles work?*
8-26	Worksheets on thinking about how stuff works.
8-27	Security in online transactions. *Such as: Registration to forums etc.*
8-28	Worksheets for security and safety.
8-29	Project Work involving many of the tools learnt.
8-30	Project Work involving many of the tools learnt.
8-31	**Revision worksheets and lab exercises.**
8-32	**Evaluation and Assessment.**

Comments:

The emphasis should move more and more towards understanding the concepts behind

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how computers and various applications work. Also understanding concepts commonly found in computer science but having general applicability.

2.9 9TH STANDARD

The syllabus for the 9th Std as available on the ICSE website is given in Annex A. This includes: Command user interface; Graphic user interface; Installing software; Office applications - Word; Excel; PowerPoint; Access; The Internet; Computing ethics;
Concepts of objects; Introducing classes; Introducing Java on BlueJ Environment; Classes as basis of all computation; Functions; Flow of control; etc.

The week-wise schedule and lessons for 9th Std are deferred to the next year.

2.10 10TH STANDARD

The syllabus for the 10th Std as available on the ICSE website is given in Annex A. This includes: Classes as basis of all computation; Functions; Flow of control; Constructors; Types; Using library classes; Iteration; Encapsulation; Arrays; Operations on Files; etc.

The week-wise schedule and lessons for 10th Std are deferred to the next year.

2.11 11th STANDARD

The detailed syllabus for the 11th Std is available from the ICSE website.
The week-wise schedule and lessons for 11th Std are deferred to the next year.

2.12 12th STANDARD

The detailed syllabus for the 11th Std is available from the ICSE website.
The week-wise schedule and lessons for 12th Std are deferred to the next year.

(Note to Reviewers: Pls help to identify the key "concepts" in CS that are worth introducing at a high school level, keeping in mind the syllabus for 9th and 10th)

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2.13 SYLLABUS REVIEW FORM

Here are few points to keep in mind while doing the review:

1. The ICSE prescribed syllabus for 9th and 10th Std, is given and we cannot change it. For the lower Std, we are free to define our own syllabus, such that a child is ready for the eventual Board exam.
2. We need your feedback on whether the defined syllabus is appropriate for the age and development level of the child. For each Std, please let us know if you feel anything is missing or if anything is over-emphasized or irrelevant.
3. Learning computers by integrating its use into other subjects is desirable, BUT it is out-of-scope for Release 2007.

Here is a rough form that you can use while reviewing.

Reviewer Name: (and affiliation)	
Std 1:	Do you feel that the chosen topics suitable for a 5-6 years old child? Please indicate the topics that you feel are: • Missing and MUST be included (very critical) • Missing and SHOULD be included (can wait for next Release) • Missing and MAY be included (would be fun for the children) • Topics that are over-emphasized and should be pared down. • Topics that are irrelevant and should be removed or moved elsewhere. • Sequencing of topics and Any other comments.
	Do you feel that the chosen schedule is appropriately paced? Please indicate the topics that you feel have been given: • Too many weeks • Too few weeks • Any other comments.
	Any other ambiguities and errors, including typos that you may find.
Std 2:	*Please repeat the same process as above, for each standard.*
…	
Std 12:	
Other points:	*Any Overall or General Comments that you would like to make.*

Please send your completed review form to sri@iitb.ac.in

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3 LESSON CREATION APPROACH

Each lesson outline includes an explanation of the topic, a sample lesson plan for use by the teacher, some worksheets for the students and some evaluation guidelines. Lessons may span across multiple weeks in the schedule.

A *creative commons* approach is being used for creating the lessons. All are welcome to participate in this effort. For each topic, anyone interested can write the lesson using the guidelines and templates given below. The lesson is then reviewed by various experts and after approval, may be incorporated into the curriculum.

3.1 AUTHORING GUIDELINES

There may be a lot of material already available on the topic for which you are creating the lessons. Some of the material that you refer (either websites or textbooks) may have copyright constraints. Please keep in mind the following while authoring a lesson:

1. DO NOT lift any content verbatim from anywhere, unless it is explicitly permitted by the copyright policy of the website or the original authors. Copyright issues are a major concern world-wide and we should take care not to violate them. It is not possible for the SSRVM Academic Council to check for copyright infringement in every lesson submitted. *So ensuring that there are no violations is your responsibility; you have to give a statement in this regard.*

2. *Most* websites will have a copyright policy stated somewhere on their site. Be sure to check this. If it says “Free for non-profit use” or something to that effect, you can use the material in your lesson. Most books are heavily copyrighted, so use them only as references. After referring to a book, significantly re-writing the material in your own words and in your own way, for teaching use, is ok. The sources you have referred must be mentioned in the lesson.

3. Any lesson that you author and share with SSRVM is covered under the Creative Commons License-Attribution-Share-Alike. See **http://creativecommons.org/licenses/by-sa/2.5/** for details**.** In brief, this means that you permit others to use your work and/or modify it. You continue to retain the rights to further develop your work in any way you choose, including commercial use.

4. There is NO royalty or any such remuneration associated with this activity.

5. If you do not agree with any of the above or for some reason are unable to comply, then please do not submit your content to SSRVM. If you agree with the above, then take a look at the next few sections to get an idea of what is required.

6. Submission Instructions: When you are done, send your lesson draft to sri@iitb.ac.in

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3.2 LESSON CREATION TEMPLATE

Use this to create the lesson for each topic. It will finally be merged into this document.

Title:	Give the title of the topic here.		
Contributors:	Names of those who created or contributed this lesson and their affiliation (if required). IF content is downloaded from some site, give the link here. Ensure that there are no copyright violations.	**Std:**	Grade level
		Reviewers:	Names of those who reviewed and/or modified this lesson.
Submission Date:	Date of sending the lesson to SSRVM Academic Council.	**Approval Date:**	Date of inclusion into the SSRVM curriculum.
		REF No:	Internal reference no.
Brief Description:	What is this topic about? Give a 2-3 lines description.		
Goal:	What aspect of this topic do we want a child to learn?		
Pre-requisites:	What should the child know before starting to learn this topic?		
Learning Outcome:	What do we expect the child to gain by learning this topic? *This is similar to the Goal but may include more abstract concepts.*		
Duration:	Number of hours (class periods).		
References:	Main sources referred for creating this content. *This is important so that teachers can find additional material on this topic.*		
Detailed Description:	Give a detailed description of the topic. *Provide the detailed description on separate page(s).* *Use figures or pictures wherever appropriate. In case of handwritten or hand-drawn materials, please scan into a single document.* *Note: If using contents from the Internet or other sources, please ensure that there are no copyright violations.*		
Lesson Plan:	Give a sample lesson plan for the teacher to follow in the class. Include any associated *Activities (or other innovative ideas)* here. *Provide the sample lesson plans on separate page(s).*		
Worksheet:	Give some worksheets for use in class or homework. *Provide the sample worksheets on separate page(s).*		
Evaluation:	Give some sample questions that a teacher can use to check whether a child has learnt this topic. *This part is optional.*		
Other Notes:	Any other remarks or supplementary notes to the teacher. *(Optional)*		

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3.3 USEFUL RESOURCES

This section gives some Internet links to resources for lesson authors. For all you know, a fair amount of the lesson that you are creating may be available on the Internet, in some form. So once you have decided your approach to the lesson, taking a look at these links and a Google search using the keywords of your topic, may save you some time for the detailing.

(Caveat: Searching the Internet for specific material can itself be time-consuming!)

http://www.kidsdomain.com/brain/computer/lesson.html
http://www.teach-nology.com/teachers/lesson_plans/computing/
http://www.eduref.org/cgi-bin/lessons.cgi/Computer_Science
http://www.internet4classrooms.com/computer_lab_help.htm

http://www.pacificnet.net/~mandel/EducationalResources.html
http://edweb.tusd.k12.az.us/nussbeg/teach.htm
http://www.col-ed.org/cur/index.html
http://www.libsci.sc.edu/miller/LessonPlansOnline.htm

http://www.ipl.org/div/subject/browse/edu30.00.00/
http://dmoz.org/Science/Educational_Resources/Lesson_Plans/
http://www.cs.purdue.edu/external_relations/k-12_outreach/lesson_plans/
http://etc.usf.edu/index.html
http://www.beaconlearningcenter.com/lessons/
http://school.discovery.com/lessonplans/

http://www.cln.org/subject_index.html
http://www.schoolnet.ca/home/e/resources/index_cur.asp
http://access.k12.wv.us/manual/lesson.htm
http://library.csus.edu/guides/rogenmoserd/educ/LESSON.HTM

http://k12linux.org/contents.html
http://www.schoolforge.net/software
http://eduforge.org/
http://www.oercommons.org/oer/oer-categories

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3.4 LESSON EXAMPLE

This is an example lesson. It is not complete and is only intended for illustration.

Title:	Introduction to the Desktop		
Contributors:	Sridhar Iyer Some material is based on the lessons by Carol Welch, at www.kidsdomain.com See references below.	**Std:**	I
		Reviewers:	Malati Baru Umesh Bellur Neela Srinivasan
Submission Date:	1st March 2007	**Approval Date:**	Not yet approved.
		REF No:	Will be filled in later.
Brief Description:	This topic introduces the concept of a Desktop that is seen after a computer boots up. This lesson uses the Windows Operating System as an example.		
Goal:	To learn about a few icons seen on a Desktop. To introduce the notion of opening a file by clicking on the icon.		
Pre-requisites:	Familiarity with computer parts, mouse buttons and moving a mouse around.		
Learning Outcome:	Familiarity with using the mouse to click icons on the Desktop. Concept that clicking an icon leads to some action by the computer. Concept that different icons are associated with different actions.		
Duration:	One period (with lab).		
References:	http://www.kidsdomain.com/brain/computer/lesson/comp_les8b.html http://www.kidsdomain.com/brain/computer/index.html		
Detailed Description:	*Attached page nos. 2, 3 (assuming this is page 1)*		
Lesson Plan:	*Attached page nos. 4*		
Worksheet:	*Attached page nos. 5, 6*		
Evaluation:	*Attached page nos. 7*		
Other Notes:	*None*		

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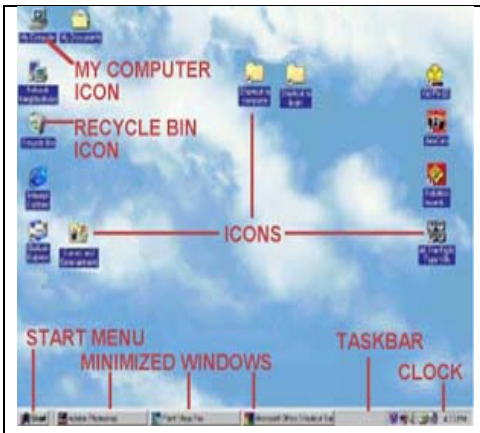
Description: (Comment: For use as a teacher's script; not as a text-book)

When your computer is booted up and ready, the screen you see is called the **Desktop**. It is the background for all activities performed by a computer. It contains the commands needed for accessing those activities. (Comment: introduce the word *program* in a later lesson. Use an informal definition for now.)

The background picture on the Desktop is called **Wallpaper.** This can be changed to show any picture that you like. In a later lesson we will learn to change the Wallpaper!

Each of these small pictures you see on the Desktop is called an **icon**. Icons are linked to activities that we want to perform using the computer. For example, this is the icon for a music player.

A sample screenshots of a Desktop is given below. The teacher should illustrate using the computer available in the school and continue.

<table>
<tr>
<td rowspan="2"> 
</td>
<td>  </td>
<td>This is the icon for a Music Player</td>
</tr>
<tr>
<td>  </td>
<td>This is the icon for a Paint program.</td>
</tr>
</table>

You can start the activity by moving the mouse to be on top of the icon, then clicking on the mouse button and pressing Enter. (Use the notion of double-click if they are already familiar, otherwise introduce double-click later).

When you click on the icon, the activity starts. The computer opens the activity and displays a new icon. This is a much bigger icon and is called a **Window.** It is the Window that actually lets you do the activity. For example, here is what happens when you click on the Music player icon. (Play a music file and/or draw something for demonstration).

Each time you click on an icon, the computer opens a new Window for the activity. As you can see, the window is quite big. Now what happens when you want to do two activities at the same time? Suppose you want to listen to music while doing painting. Is there enough space on the Desktop for both the Windows to be open and visible together? No!

Notice the interesting thing: When you click anywhere in a Window, that Window moves to the front of the Desktop. The other Windows go back. Whichever Window you click your mouse in, the computer is ready to do your command for that activity. (Demonstrate using the music player and paint application).

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Now what happens if one Window is fully hiding the other and you cannot see it at all to click? Aha! Windows and Icons can be moved around on the Desktop by clicking on them and dragging them out of the way. (Demonstrate).

(Comment to teacher: If the students were able to understand this easily, the concept of minimizing and maximizing Windows may be introduced in this lesson itself. Otherwise it may be left to the next class. The teacher will have to improvise using his/her own flow.)

Lesson Plan: (This is only an example. The teacher should create his/her own lesson).

1. Prepare for the lesson by making a clean Desktop with only a few icons relevant to the lesson. Have an interesting background Wallpaper but ensure that it does not clutter the Desktop or reduce the readability of the icons.
2. Take the computer to the class or vice versa, whichever is applicable.

3. Switch on the computer.
4. Engage the children by asking some quick questions from the earlier classes. For example, names of the various components, what is the use of the mouse?

5. Let the children simply look at the Desktop and describe what they see.
6. Tell them about icons and the functions of the icons that they see.

7. Demonstrate launching of an application by clicking on a icon. Play a music file.
8. Tell them about the Window that opens up. Let them try it on their own, if possible.

9. Click on another icon to open another Window, say a Paint application.
10. Demonstrate some rudimentary actions using Paint. Again let them handle the mouse, if possible.

11. Clutter up the desktop with a bunch of open Windows. Hide the Window that they seem to find most attractive.
12. Now ask them how to find the Window that they are interested in.
13. Then tell them about clicking on the Window to get it forward. Also demonstrate moving the Windows around.

14. Ask them what they do after they finish writing in their notebooks. Introduce the notion of closing an application Window by clicking on the Red X button.

15. Finally tell them that the screen they see when there are no open Windows is called the Desktop. Change the Wallpaper while they are watching but without telling them what you did or how. When they ask, say “Magic!” and leave it for the next class. ☺

(Comment: This outline is in reverse order to that of the description. This is just to emphasize that there no single “ideal” way of teaching. The teacher should not rely overly on this material but should use whatever style works for him/her.)

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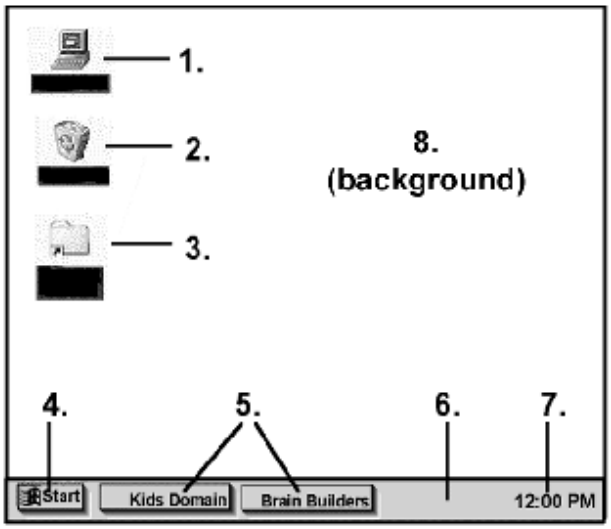
Worksheets: (Comment: These are just some sample worksheets for this topic. They do not correspond exactly to the content above but can give an idea of what to do)

Computers: Inside & Out - The Windows Desktop Labeling Worksheet

Label the diagram below by writing the name of the desktop feature in the blank next to the corresponding number.



Start Menu

clock

My Computer icon

icon

minimized windows

taskbar

Recycle Bin icon

wallpaper

1._____ 5._____

2._____ 6._____

3._____ 7._____

4._____ 8._____

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Computers: Inside & Out - The Windows Desktop Vocabulary Worksheet

Fill in the blanks with the vocabulary words from the box below.
Use each word only one time.

desktop	GUI	icon	Recycle Bin
Start Menu	Control Panel	task bar	title bar
windows	tool bar	scroll bar	wallpaper

1. You put things in the _____ that you no longer need or want.

2. A _____ uses graphics or pictures to help the user navigate and access programs.

3. The Start Menu and clock are found on the .

4. The _____ is the background screen for all programs and contains the commands needed to access them.

5. An _____ is a small picture that links to a file or program.

6. At the top of each window, the _____ contains the title and buttons to close, minimize and resize.

7. Moving the _____ up or down allows you to see all of the information in a window.

8. Programs and applications run inside _____ that can be opened, closed or resized.

9. The _____ is like a backdrop on your screen that can be changed.

10. Found below the menu in some windows, the _____ contains icons or options that allow you to perform specific tasks

11. The _____ contains basic operations such as run, shut down and find.

12. The _____ contains important system controls.

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Evaluation: (Comment: Only a few suggestions are given below. Please improvise.)

In class:

1. Create a different match-the-following or labeling worksheet and use it.
2. Create a different fill-in-the-blanks or vocabulary worksheet and use it.
3. Sorry, no more ideas at this point. ☺

In lab:

1. Keep a few music files on the desktop and ask the child to play a specific one.
2. Ask the child to move the Window somewhere else and then close the Window.
3. Make it fun for the kids. They are just in 1st Std after all. ☺

Other Notes:

This lesson is actually independent of the Operating System used. The same exercises can be carried out using Linux also.

Some other interesting sources and sites for reference are:

- http://www.teach-nology.com/teachers/lesson_plans/computing/
- http://www.eduref.org/cgi-bin/lessons.cgi/Computer_Science

END of material on "Introduction to Desktop"	REF No:

NOTE:

This lesson example has been deliberately kept brief for the purpose of illustration. For it to be actually useful, the description has to be expanded with more pictures and explanation and many interesting worksheets need to be added. The lesson's impact hinges upon the number and quality of the worksheets.

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3.5 LESSON REVIEW FORM

This is a template of the form that reviewers will use for approving/rejecting a lesson.

Lesson Title:	
Reviewer Name:	
Correctness:	Please list ALL the factual errors that you find, including minor ones.
Completeness:	Please list ALL the sub-topics which should be there but are missing.
Ratings	***Please rate the lesson for the following, on a scale of 0-4.*** *0 – Poor; 1 – Passable; 2 – Ok, 3 - Good; 4 – Great.*
Lesson flow:	A good rating for flow means that there is a logical sequence in the points covered by the lesson. The transition from one to the next is smooth and natural.
Clarity:	A good rating for clarity means that each point is explained well, in the technical sense. There should be no scope for misinterpretation.
Ease of use:	A good rating for ease of use means that a teacher using it for the first time will be able to understand and follow it without difficulty.
Language:	A good rating for language means that the material is appropriate for the level and the sentences are well written.
Balance:	A good rating for balance means that the emphasis on theory (explanation in class) versus lab (demonstrations/worksheets/exercises) is appropriate.
Depth:	A good rating for depth means that there is a good balance between breadth (introduction of new ideas) and depth (further expansion of one idea). Too much breadth without depth or vice versa is not desirable.
Timing:	A good rating for timing means that a teacher should be able to comfortably cover the lesson in the given time.
Innovativeness:	A good rating means that the lesson as presented is likely to engage attention and be interesting. This is a subjective criterion.
Worksheet:	A good rating means that the worksheets are likely to be interesting.
Overall Rating:	What is your overall feeling about this lesson? Rate on a scale of 0-4
Other points:	*Any Overall or General Comments that you would like to make.*

Please send your completed review form to sri@iitb.ac.in

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4 LESSON OUTLINES

This section gives the lesson outline for each topic of every standard, after it has been reviewed and approved for inclusion into the curriculum. This section will change or expand from year to year, as existing lessons are improved and new lessons added.

Work is ongoing to create suitable lessons for every topic. A lesson may span across multiple weeks in the schedule. Guidelines for detailing each topic are given independently. These guidelines define:

- The minimal sub-topics that must to be covered in the lesson.
- Other optional sub-topics may also be covered.
- Suggestions for detailing the description.
- Suggestions for preparing worksheets.
- References and pointers to existing content.

Authors may use these guidelines along with the templates in Section 3, to create the lessons. The lessons are included in this section, as and when they are approved.

Note: Simply translating an existing lesson from one platform (Windows XP or Linux) to the other is also a useful contribution. The source reference is simply the original lesson.

(There are no lessons included here as yet; should they be in another document?)

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5 ANNEX A: CURRICULUM SURVEY

A brief survey of the curriculum followed in India and Abroad is given in this section.

5.1 NCERT (CBSE Board)

National Council of Educational Research and Training (NCERT) has released a national framework of Curriculum for IT in schools. The competencies, skill sets are divided into six heads namely Fundamental Operations and Concepts, Social and Ethical issues, IT Tools, Communication Tools, Technology Research Tools and Tools for Problem solving.

The curriculum also proposes the desirable competencies for teachers. The children are expected to attain the skills listed out in the syllabus during their schooling as part of their general education till class 10. The curriculum is categorized for three levels, Primary, Middle and Secondary schools. At each level, the six heads as listed above are again divided into competencies, activities through which these competencies can be attained and detailed specific skills.

At the end of each level: Primary, Middle and Secondary schools, a list of learning outcomes and evaluation techniques are also prescribed. The CBSE board follows the curriculum framework of NCERT.

5.2 ICSE Board

The ICSE Board system has Computer applications as a core subject from 1st to 8th standard. In 9th and 10th standard it is an elective subject and hence is not compulsory. The outline of the syllabus is given to the schools and they have the freedom to follow textbooks by any Publisher which they find suitable.

The syllabus for 9th standard covers the following topics: Computer Hardware functions, data representation and Internal computer structure, Computer software, Social context of computing and ethical issues, Algorithms, Programming using a High level language and Computers in everyday life.

The syllabus for 10th standard covers the topics: Computer structure, Review of Programming, Advanced Programming, Documentation of Programming, and Practical sessions. A part of the syllabus document from the ICSE website is given below.

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COMPUTER SCIENCE (71)

Aims:

1. To enable candidates to comprehend the concepts and practices of Computer science.
2. To develop an understanding of how computers store and process data.
3. To enable candidates to describe the major components of computer hardware, their functions and interaction.
4. To develop an understanding of the fundamental concepts of programming and the ability to apply the same.
5. To develop an appreciation of the implications of computer use in contemporary society.

CLASS IX

There will be one paper of two hours duration carrying 80 Marks and Internal Assessment of 20 Marks.

The paper will be divided into two Sections A and B.

Section A (20 marks): This section will consist of compulsory short answer questions, testing knowledge, application and skills relating to elementary/fundamental aspects of the entire syllabus.

Section B (60 marks): This section will consist of questions based on programming. There will be a choice of questions and candidates will be required to answer four questions from this section.

PART I – THEORY

1. **Computer hardware: parts of a computer and their functions**

   CPU, the clock, cache memory, primary memory, secondary memory, input and output devices, communication devices (the aim is not to describe/discuss an exhaustive list of devices but to understand what parts are present in a typical computer and what the function of each part is).

2. **Data representation and internal computer structure**

   (i) Number systems, base of a number system - decimal, binary, octal, hexadecimal representation, conversion between various representations, character representations (ASCII, ISCII, Unicode).

   (ii) Representations for integers, real numbers, limitations of finite representations.

   (iii) Internal structure of a computer, a simple decimal load and store computer and its machine language, instruction format, registers, program counter, instruction register; register addressing modes, instruction cycle, assembly language for the same computer, simple algorithms in assembly language.

3. **Computer software**

   The boot process, operating system (resource management and command processor), file system.

   (i) Boot process, operating systems - resource management, command processing.

   (ii) Directories, files and hierarchical file system.

   (iii) Programming languages (machine language, assembly language, high level language).

   (iv) Compilers and interpreters.

   (v) Application software.

4. **Social context of computing and ethical issues**

   (i) Intellectual property and corresponding laws and rights, software as intellectual property.

   (ii) Software patents, copyrights, and trademarks, software licensing and piracy.

   (iii) Free software foundation and its position on software, open source software.

   (iv) Privacy, email etiquette.

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5.3 State Boards

Many State Boards have introduced the subject of Computer applications in schools but not many details are available online at present. Typically, the syllabus for a State Board is expected to be a subset of that prescribed by CBSE/ICSE, with some variations. Hence the computer science curriculum of State Boards has not been studied in detail.

5.4 ACM Curriculum

A Model Curriculum for K -12 Computer Science, Final Report of ACM Task Force.
(This is a good reference document; Expand this section with more details.)
This ACM (Association of Computing Machinery) report proposes a model curriculum to integrate computer science as a subject throughout primary and secondary schools, both in the United States and throughout the world. With the rapid growth of computing technology and it's relevance to the modern world in terms of real life applications, there is an urgent need to provide a framework for the schools to follow.

Computer science is already an established core discipline at the college level but the holistic integration of computer science concepts into the K–12 curriculum has not been happening. As a result, the general public is not as well-informed about computer science as it should be. This report provides a framework within which schools can revise their curricula and be ready to educate the youngsters.

This curriculum model provides a four-level framework for computer science. The first two levels suggest subject matter that ought to be mastered by all students, while the second two suggest topics that can be elected by students with special interest in computer science, whether they are college-bound or not.

5.5 Schools Abroad

5.5.1 Virginia Public Schools

The Standards of Learning for Computer/Technology is a reference document for Virginia Public Schools is a reference document. The Standards identify and define the progressive development of essential knowledge and skills necessary for students to access, evaluate, use and create information using technology. They provide a framework for technology literacy and demonstrate a progression from physical manipulation skills for the use of

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technology, to intellectual skills necessary for information use, to skills needed for working responsibly and productively in groups.

Computer/technology proficiency is not an end in itself, but lays the foundation for continuous learning. The focus is on learning using technology rather than learning about technology. To become technologically proficient, the student must develop the skills through integrated activities in all content areas K-12, rather than through one specific course. These skills should be introduced and refined collaboratively by all K-12 teachers as an integral part of the learning process. Teachers can use these standards as guidelines for planning technology-based activities in which students achieve success in learning, communication, and prepare them to meet the challenges of today's technology-rich world of work.

This document is divided into K-2, 3-5 ,6-9, 10-12 Grades and lists out Basic Operations and concepts, Social and Ethical issues, Technology and research tools, Problem solving and decision making tools ,Technology and Communication tools for every grade.

5.5.2 Pennsylvania School Curriculum [Avon Grove school]

The Pennsylvania Academic Standards for Science and Technology and the National Educational Technology Standards for Students from ISTE (International Society for Technology in Education) define the curriculum for Grades K-8. Grades 9-12 will have specific classes that students may choose related to technology.

The milestones for the curriculum describe what students should know and be able to do by the end of fourth, seventh, tenth and twelfth grade. In addition, the standards also reflect the progress that they expect their students to achieve. This curriculum assumes that the students can apply the skills learnt at the earlier levels and add new concepts every year. Previous learning is reinforced but not taught again.

5.5.3 New York Public School Curriculum

The New York State Standards for Computer Technology divides the curriculum into two levels: Elementary (1^{st} to 5^{th} grade) and Intermediate (6^{th} to 8^{th} grade).

The Elementary level has the following heads: Word processing, Computer skills, Networking and Telecommunication skills, Legal and Ethical issues, Information Management skills.

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The Intermediate Level has the following heads : Word processing, Computer skills, Networking and Telecommunication skills, Legal and Ethical issues , Information Management skills, Database skills, Spreadsheet skills, Multimedia skills.

5.5.4 Ontario School Curriculum

The Computer Skills curriculum for 1st to 8th grade is organized into seven heads: Operating the Computer, Word Processing, Keyboarding, Graphics, Database, Spreadsheets, Internet, Multimedia and Authoring Software.

Every Grade starts with an Overall and Specific expectations. Achievement levels at the end of each grade are also classified as Understanding of concepts and terminology, Keyboarding and word processing skills, communication of required knowledge, Application of concepts and skills.

5.5.5 Pocantico School Curriculum

This curriculum recognizes the inevitable change in computer technology and as such should be viewed as an evolving, flexible guideline for study, rather than a fixed set of skills. The curriculum is divided into Primary level [1st to 5th] and Middle school level [6th to 8th] and elaborates on the exit goals at the end of each grade.

The major goals at the end of 8th grade are Computer operations and Terminology, Using electronic Information resources, Using Spreadsheets and Databases, Organizing and analyzing information, presenting information in variety of ways, Ethical behaviour in using Computer technology, Proficiency in using Word-processing tools.

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6 ANNEX B: TEXTBOOKS SURVEY

This section gives a listing of the topics covered in various textbooks surveyed and will later provide an informal evaluation of these textbooks as per the criteria defined in the Lesson Review Form (Section 3.5).

Table 2:	**Summary of Textbooks Reviewed for School Computer Science.**				
Publisher:	**Oxford Univ Press**	**Rachna Sagar**	**Kalra Publications**	**JeevanDeep Prakashan**	**Frank Bros**
Authors:	*Sangeeta Panchal, Alka Sabharwal*	*Vaishali Bhatnagar, Anu Pasricha, Reeta Sahu*	*M.M.Joshi, Amit Kantiwal*	*Sadhana Sharma*	*Manjeet Jauhar, Bhuvana Balasubramanian*
Year:	2005 (Second edition) ***Follows NCERT framework***	2006 (Fourth edition) ***Recommended for CBSE***	2005 (Revised edition)	2006? (Revised edition)	2002 (First edit
Standard					
1st	Parts of a computer Uses of computers Mouse Keyboard	Computer Parts of a computer Handle with care Uses of computers Keyboard Mouse handling Paint	Useful electronic Devices About Computer History of Computer Some other Parts Uses of Computer Importance of Computer Machines Don'ts with Computer Computer Alphabets	Computer Machines Electricity Information Computer and its parts Monitor Cursor Let's use the Keyboard Mouse and Printer CPU A to Z of Computer World	What is a computer Uses of computer Computers everywhere Parts of a computer Monitor Keyboard Input, Processing, Output CPU Compu Maths
2nd	Computers - A Machine.	What is a Computer?	Computer	Machines/Electricity	Applications of computer

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	Parts of computers Application of Computers Start and Shut down Keyboard Mouse Fun with Paint	Parts of a computer Storage devices More about computers Things to do How does it work? Input-Process-Output Keyboard Mouse handling Paint Operating a computer Precautions	Components of a computer Keyboard and keys CPU and its usefulness Monitor and its uses Types of Computer Languages and LOGO March of a TURTLE How a computer works Uses of computer	Man and Machine Information Where to store Information? Why do we need Computers? What is a Computer? Computer System Let's Use Keyboard Input-Output Some Maths with Computer Uses of Computer Some Do's and Don'ts	How computers work Getting started with a PC Using the Keyboard Compu Maths
3rd	Introduction to Computers Keyboard Operating system Operating a Computer Starting Paint Drawing in Paint Introduction to LOGO LOGO Commands Writing with LOGO Arithmetic with LOGO Notepad Project work	Know your Computer Parts of Computer Input output devices Hardware and software First step to Lab Your windows Starting MS Paint Fun with LOGO Drawing, Moving cmds Introduction to MS Word Project work	Introduction and History Uses of main parts. Other basic devices. Operating a computer Other operations. Languages and LOGO Introduction to Windows 98 Introduction to WordPad Introduction to Multimedia	The Computer Parts of Computer LOGO **11 Chapters on LOGO commands and usage**	Man and Computer Structure of a computer Input devices Output devices Windows Paintbrush Compu Maths
4th	Computer Evolution Input an Output Devices More about Windows	Computer overview History of Computer Working with windows	Evolution of Computer Computer: Detailed Focus Computer Applications	Computer LOGO **15 Chapters on LOGO**	Learning step by step Introduction to LOGO **6 Chapters on LOGO commands and usage**

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				commands and usage	
	More about Paint More LOGO commands REPEAT and PRINT Introduction to MS Word Multimedia Project work	Working with MS Paint Drawing with LOGO Procedures in LOGO Advanced LOGO Word Processing Document Formatting Project Work	Computer terminology Learning PC LOGO Windows98 - OS Working in Paintbrush Working with MS Word Multimedia and Internet Social Ethics	Some programs	
5th	Applications of Computers Data Storage Media More about Windows Working with Calculator LOGO Procedures Editing Text in MS Word Formatting in MS Word More features of MS Word Internet Flowcharting Project work	Computers Overview Input Units Output Units Computer Memory Computer Software MS-Windows98 Clip art and Word art Algorithm and Flowchart Introduction to BASIC BASIC statements Multimedia and Internet Project Work	Generation of Computers Fundamental Elements Output Devices Uses of Computer More about Windows98 More about Paintbrush More about MS Word Electronic Mail Introducing Networks Social Ethics	Computer Lets write a Program Language (BASIC) Print System Commands Constants and Variables LET Let's Try Print Again GOTO Graphics Project	Algorithms and flowcharts Windows ME Paintbrush Wordpad Multimedia, Internet and email Compu Maths Compu English
6th	Computer Peripherals More on MS Word Creating tables in MS Word Word Art and Draw Mail Merge MS Excel Internet	Review of a Computer Uses of a computer Characteristics Classification Input / output devices Hardware and software Windows98	Evolution of Computers Fundamentals of Computers Elements of Computers Working with Windows 98 Working with word processor Flow Chart Multimedia and Internet	Computer Architecture Computer Generation A Quick Revision (BASIC) Revision of Commands More System Commands INPUT Flow Chart	**Not Seen.**

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	Email Basics of BASIC Project work	Windows: My computer Windows: Accessories Word processing Document Formatting Clip art and word art Excel and Powerpoint Multimedia and Internet Project work		For … Next LEN and Library Function Read - Data Condition and Decision Counters On GOTO Graphics	
7th	Computer peripherals More features of MS Word MS Excel Editing in MS Excel Formatting in MS Excel Formulas in MS Excel Intro to PowerPoint Internet as post office Computer Viruses QBASIC looping statements Project	Review of Computer Generations of Computer Computer memory Operating system MS DOS commands Files in MS-DOS Windows: Explorer Word processing Text formatting in Word Mail merge in Word MS Excel Basics PowerPoint basics Multimedia Working with Internet Project work	Fundamentals of Computer DOS and Windows Introduction to Word Multimedia and Internet Computer Virus Fundamentals of BASIC	Computer System MS DOS File, Batch file, Directory Format/Mode Date, Time, Prompt Version,Volume, Label, CLS Wildcards Directory (DIR) Path and Pathname **9 chapters on DOS commands** Common Error Message	**Not Seen.**
8th	Types of Computers Advanced MS Word Advanced MS Excel	Review of Computer Number system Computer languages	Fundamentals of Computer Introduction to Word Networking	Windows Window Elements Explorer	**Not Seen.**

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	Charts in MS Excel MS PowerPoint Text in MS PowerPoint Organization in PPT Graphics,Charts in PPT Enlivening a PPT Intro to MS Access What's on the Internet E-Commerce Graphics in QBASIC Project	Path and Batch file External commands Windows98 Worksheet basics Editing in Excel Charts in Excel PowerPoint basics Slide formatting Computer Network Web browser HTML programming Project work	Multimedia and Internet	Control Panel My Computer, Recycle Bin Word pad and Notepad Paint Internet Explorer Calculator and Address Book Windows 2000	
9th	**Not Seen.**	**Not Seen.**	**Not Seen.**	MS Word : Introduction Document Navigating the Document Formatting of Text Paragraph Formatting Document Tools	**Not Seen.**
10th	**Not Seen.**	**Not Seen.**	**Not Seen.**	**Not Seen.**	**Not Seen.**

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Publisher:	**IL&FS -- ETS**
Authors:	-
Year:	2005 (First edition)
Standard	
Kid Clix - Module 1	Computer Awareness Simple Edu Software
Junior Clix - Module 1	Not seen
Junior Clix - Module 2	MS Paint Typing Skills Simple Edu Software Project Based Learning
Junior Clix - Module 3	Introduction to Word Pad Typing Tutor Project Based Learning
Junior Clix - Module 4	Simple Edu Software Wordpad and Paint Typing Tutor Project Based Learning
Intermed Clix - Mod 1	Computer fundamentals Windows Explorer Introduction to MS Word Project Based Learning
Intermed Clix - Mod 2	Introduction to PowerPoint Internet Project Based Learning
Intermed Clix - Mod 3	Not seen.
Senior Clix - Module 1	Not seen.
Senior Clix - Module 2	Not seen.
Senior Clix - Module 3	Introduction to HTML Programming Turbo C++

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7 ANNEX C: HARDWARE AND SOFTWARE REQUIREMENTS

(Specifications of hardware & software required to be installed in each school).

8 ANNEX D: WINDOWS INSTALLATION AND MAINTENANCE

(Guidelines for installing WindowsXP, application programs and maintenance).

9 ANNEX E: LINUX INSTALLATION AND MAINTENANCE

(Guidelines for installing Edubuntu, application programs and maintenance).

10 ANNEX F: BIBLIOGRAPHY

1. NCERT Framework website
2. ICSE Syllabus website
3. ACM Task Force report website.
4. References for other schools.
5. Creative Commons website.
6.

(Give the complete list of references here).

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