

Introduction

An mp2 review was conducted in 2005 to help in the setting of implementation priorities to move mp2 forward to FY2006-2008. One of the key priorities recommended was to set Baseline ICT Standards for pupils to ensure that all pupils acquire the necessary ICT¹ skills to support them in learning and prepare them for future needs.

The Baseline ICT Standards for pupils are implemented in 2 phases:

- Primary Schools: January 2007 onwards
- Secondary Schools & JC/CI: January 2008 onwards

Baseline ICT Standards – Guide to Implementation aims to support schools, in particular, Heads of Department working with their teachers to integrate the Baseline ICT Standards into the curriculum. It offers tips, suggested strategies and resources to integrate the Baseline ICT Standards into the curriculum for pupils as well as monitor their attainment of the ICT standards. Many of the examples in this guide are drawn from 10 pilot Primary Schools and 9 pilot Secondary Schools². Schools have the flexibility to adopt and adapt the suggestions in this guide to meet their needs.

There are five main sections in this guide:

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¹ ICT refers to Information and Communication Technology

²The Baseline ICT Standards were piloted in 10 Primary Schools in 2006 and in 9 Secondary Schools in 2007 to gather feedback on achievability and relevance of the standards as well as implementation practices.

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Section A: Baseline ICT Standards for Pupils

Baseline ICT Standards for Pupils

In this section:

1. ICT Skills Attainment
2. Key Stages
3. Learning Objectives and ICT Focus
4. Areas of ICT Skills
5. Cyberwellness
6. Evidence of Attainment

The **Baseline ICT Standards** are a comprehensive list of ICT skill competencies set out in progressive stages. These represent the basic level of knowledge, skills and values that pupils need in order to fully benefit from a curriculum enriched with ICT, and eventually thrive in a technology-driven society. Refer to [Table A-1](#) for the Baseline ICT Standards.

These standards have been benchmarked against overseas ICT standards as well as curriculum and existing practices in our schools. They are to be integrated into core subject areas and project work, and will be reflected in curricular documents put out by the Curriculum Planning and Development Division to schools, and supported with curricular exemplars for use by teachers.

1. ICT Skills Attainment

At the end of the Primary and Secondary education, pupils will have acquired a basic set of **ICT skills**:

Primary pupils will be able to

- a. Operate computers and applications in ICT-enabled learning environment
- b. Search for information and communicate over the Internet
- c. Create a short document using a word processor
- d. Represent tables of information in word processors and spreadsheets
- e. Create a short presentation with multimedia elements
- f. Collect data using ICT tools

Secondary pupils will be able to

- a. Search independently for information and communicate over the Internet
- b. Create a publication (e.g. report, pamphlet and newsletter) using a word processor
- c. Integrate digital media from different sources into a document, spreadsheet and presentation
- d. Represent data using graphs and charts in word processors and spreadsheets
- e. Use built-in functions for calculations in a spreadsheet
- f. Create and edit media elements for a multimedia presentation
- g. Transfer data collected from ICT tools to computers

Baseline ICT Standards for Pupils

At the end of the Primary and Secondary education, pupils will also have acquired skills related to ethical and legal as well as safe and responsible use of ICT, which is aligned to the Cyberwellness Framework³:

Primary and Secondary pupils will

- a. Use appropriate language, demonstrate mutual respect and observe etiquette in communication
- b. Respond appropriately when encountering illegal or unsuitable materials on the Internet
- c. Be aware of and take precautionary steps against the dangers of cyber abuse
- d. Respect intellectual property and comply with copyright laws and regulations
- e. Prevent and minimise security risks in different online situations
- f. Protect private information against exploitation
- g. Maintain a balanced use of technology to avoid computer addiction
- h. Verify the credibility of information and that information is communicated accurately and responsibly

2. Key Stages

The attainment of the Baseline ICT Skills is set out in four progressive Key Stages. The first Key Stage starts at Primary 1 to 3 and the last stage ends at Secondary 3 – Pre-University 2. For the last Key Stage, focus is largely on the application of all the ICT skills acquired in the earlier Key Stages to achieve curricular objectives in various ways.

Key Stage 1	Key Stage 2	Key Stage 3	Key Stage 4
Pri 1 to 3 <i>e.g. create a short text using word processor</i>	Pri 4 to 6 <i>e.g. create a short paragraph which includes punctuations and symbols</i>	Sec 1 to 2 <i>e.g. create pages of text in a document</i>	Sec 3 to Pre-U 2 <i>e.g. create documents for different purposes, such as, newsletters, reports, pamphlets</i>

Schools have the flexibility to accelerate the skills development and ICT-enabled learning experiences according to the capability and interests of their pupils, within and across the Key Stages.

3. Learning Objectives and ICT Focus

The learning outcomes described for each Key Stage indicate the pedagogical purpose of ICT use in the curriculum. The focus is on the thinking and process skills that are common and necessary across all core subjects, such as gathering and organising information, presenting information and ideas (e.g. use of digital resources to gather and record information in Key Stage 1).

³ The MOE Cyberwellness Framework was launched in Oct 2007.

Baseline ICT Standards for Pupils

The focus of ICT skills range from basic operations (e.g. opening, saving and retrieving a file) to ICT process skills (e.g. using a spreadsheet to process data for analysis and search engines to retrieve current information).

4. Areas of Baseline ICT Skills

Broadly, the Baseline ICT Skills are categorised into the following areas to support pupils' learning:

Areas	ICT Skills
Learning with Searches	Internet navigation and search
Learning with Text	Word processing
Learning with Multimedia	Production and manipulation of multimedia content
Learning with Spreadsheet	Data management and processing
Learning with Communication Tools	Online communication
Learning with Data Collection Tools	Data collection and transfer

The ICT skills defined are generic and are applicable across subjects. Schools may choose to focus the integration of certain areas of ICT skills in specific subjects. For example, the use of word processor can be integrated into English Language while the use of spreadsheet into Mathematics and Science. However, schools should ensure that the opportunities for ICT learning experiences as a whole are well-spread out across the curriculum.

Baseline ICT Standards for Pupils

The ICT tools and resources used by the pupils can include the following:

- a. Applications
 - Internet search engine
 - Word processor
 - Spreadsheet tool
 - Presentation tool
 - Media editing tool⁴
- b. Hardware
 - Data probe
 - Digital camera
 - Sound recording device⁵
 - Scanner

Refer to [Annex A-1](#) for an elaboration of the descriptors for each area of Baseline ICT Skills in the four Key Stages.

5. Cyberwellness

The Baseline ICT Standards include a cyberwellness strand that covers the critical areas and issues associated with ethical and legal as well as safe and responsible use of ICT. These have been spread over the later three Key Stages and should be integrated into learning activities wherever appropriate. For example, when pupils are communicating with others through email or gathering information and using digital resources from the Internet, they should be taught and be required to practise Internet etiquette and respect copyright laws. The cyberwellness areas and descriptors provide a guide for teaching and learning with ICT.

6. Evidence of Attainment

The attainment of the Baseline ICT Standards by pupils can be observed through softcopies or print-outs of their work. As pupils gain competence in the use of different ICT tools, digital portfolios and even online journals (e.g. blog) can be introduced to document attainment. Refer to [Section E](#) for more suggestions on monitoring the attainment of pupils' ICT skills.

⁴ E.g. Windows Movie Maker, iMovie, Photoshop, Audacity

⁵ E.g. mp3 recorders, microphones

Baseline ICT Standards for Pupils

Table A-1: Baseline ICT Standards for Pupils (Version 4)

Primary 1 - 3		
Learning Objectives Pupils will <ol style="list-style-type: none"> 1. Gather and record information 2. Present information 		
ICT Focus Pupils will <ol style="list-style-type: none"> 1. Perform basic ICT operations 2. Access digital resources 3. Create a short presentation with text and pictures 		
Skill Areas	Code	Skills
Basic Operations (K)	PK1	Navigate in a Graphical User Interface (GUI)
	PK2	Use application software and work with files
Learning With Searches (H) <i>Internet navigation and search</i>	PH1	Use digital resources from specified sources
Learning With Text (T) <i>Word processing</i>	PT1	Type short sentences or paragraphs
	PT2	Edit and format short sentences
Learning With Multimedia (M) <i>Production and manipulation of multimedia content</i>	PM1	Combine text with drawings or pictures in a presentation
Suggested Evidence - Softcopies or print-outs of pupils' work		

Baseline ICT Standards for Pupils

Primary 4 - 6		
Learning Objectives Pupils will <ol style="list-style-type: none"> 1. Gather and record information 2. Organise information 3. Communicate information and ideas 4. Recognise and address cyberwellness issues 		
ICT Focus Pupils will <ol style="list-style-type: none"> 1. Use the Internet for email and searches 2. Create, edit and format text in word processors, spreadsheets and presentation tools 3. Produce a short presentation with available multimedia elements 4. Use ICT tools to collect data 		
Skill Areas	Code	Skills
Learning With Searches (H) <i>Internet navigation and search</i>	PH2	Use search engines and keywords
Learning With Spreadsheet (S) <i>Data management and processing</i>	PS1	Create, edit and format tables of data
	PS2	Use mathematical formulae
Learning With Text (T) <i>Word processing</i>	PT3	Type paragraphs of text
	PT4	Edit and format paragraphs of text
	PT5	Create tables and edit content
Learning with Multimedia (M) <i>Production and manipulation of multimedia content</i>	PM2	Create a multimedia presentation
Learning with Communication Tools (C) <i>Online communication</i>	PC1	Send a message
	PC2	Send an attachment
Learning With Data Collection Tools (D) <i>Data collection and transfer</i>	PD1	Record pictures, sound, video or data using ICT tools
Suggested Evidence: <ul style="list-style-type: none"> - Softcopies or print-outs of pupils' work - Digital portfolio (e.g. pupil folder or project website/blog) 		
Cyberwellness Areas	Code	Skills and Values
Ethical and Legal Use	C1	Handle Inappropriate Content
	C2	Prevent Cyber Abuse
	C3	Display Internet Etiquette
	C4	Respect Intellectual Property
Safe and Responsible Use	C5	Protect Private Information
	C6	Avoid Computer Addiction

Baseline ICT Standards for Pupils

Secondary 1 – 2		
Learning Objectives Pupils will <ol style="list-style-type: none"> 1. Gather and record information independently 2. Examine, organise and use information and digital resources 3. Present and communicate information and ideas 4. Recognise and address cyberwellness issues (skills and values from earlier key stage should be continuously reinforced) 		
ICT Focus Pupils will <ol style="list-style-type: none"> 1. Use the Internet for communication and searches 2. Create, organise and lay out text in word processors, spreadsheets and presentation tools 3. Produce multimedia elements using a simple application software 4. Create links to access a variety of data sources 5. Set up ICT tools to collect and process data 		
Skill Areas	Code	Skills
Basic Operations (K)	SK1	Operate in an interactive media environment
Learning with Searches (H) <i>Internet navigation and search</i>	SH1	Use search engines and keywords independently
Learning with Spreadsheet (S) <i>Data management and processing</i>	SS1	Create, edit and format graphs or charts
	SS2	Use built-in functions to process data
Learning with Text (T) <i>Word processing</i>	ST1	Create pages of text
	ST2	Edit and format pages of text
Learning with Multimedia (M) <i>Production and manipulation of multimedia content</i>	SM1	Produce multimedia elements
	SM2	Create presentation with hyperlinks
Learning with Communication Tools (C) <i>Online communication</i>	SC1	Communicate online
Learning with Data Collection Tools (D) <i>Data collection and transfer</i>	SD1	Export data collected
Suggested Evidence: <ul style="list-style-type: none"> - Softcopies or print-outs of pupils' work - Digital portfolio (e.g. pupil folder or project website) - Online journal (e.g. blog, forum, wiki, audioblog, podcast) 		
Cyberwellness Areas	Code	Skills and Values
Ethical and Legal Use	C4	Respect Intellectual Property
Safe and Responsible Use	C5	Protect Private Information
	C6	Avoid Computer Addiction
	C7	Manage Security Risks
	C8	Verify Information Sources

Baseline ICT Standards for Pupils

Secondary 3 – 5 / Pre-University		
Learning Objectives Pupils will <ol style="list-style-type: none"> 1. Revise information-gathering strategies to retrieve and organise information from various sources 2. Evaluate information in terms of credibility and relevance for a specific purpose 3. Present and communicate information and ideas clearly 4. Address cyberwellness issues (skills and values from earlier key stages should be continuously reinforced) 		
ICT Focus Pupils will be proficient in the following: <ol style="list-style-type: none"> 1. Locate, evaluate and synthesize reliable information from multiple Internet sources 2. Manipulate multimedia elements and create a range of media products 3. Use online and network means to communicate, collaborate and distribute media within and beyond the classroom 4. Employ ICT tools independently to collect and process different kinds of data and media 		
Skill Areas	Examples of Application	
Learning with Searches (H) <i>Internet navigation and search</i>	Locate, select and use resources to enhance learning of curriculum topics (e.g. simulation to explore the effects of changing conditions such as a Tsunami)	
	Use and analyse (e.g. compare and contrast) information from various sources to complete assignments and project work	
Learning with Spreadsheet (S) <i>Data management and processing</i>	Process data and interpret results to draw inferences (e.g. number patterns and what-if analysis)	
	Plan and design spreadsheets based on a scenario to solve a problem (e.g. which loan package to take up)	
Learning with Text (T) <i>Word processing</i>	Use the word processor frequently with accuracy and efficiency to complete assignments	
	Organise ideas for different purposes (e.g. publications such as newsletters, pamphlets and reports)	
Learning with Multimedia (M) <i>Production and manipulation of multimedia content</i>	Use the presentation tool frequently to organise and present information and ideas	
	Produce multimedia presentations using a variety of media elements to illustrate ideas to targeted audiences (e.g. digital story)	
Learning with Communication Tools (C) <i>Online communication</i>	Use ICT tools frequently to exchange information and data collected with peers, teachers, experts, groups of people and organisations	
	Communicate and collaborate in ways appropriate to the task and audience (e.g. use blogs or wikis for expressing personal or group views)	
Learning with Data Collection Tools (D) <i>Data collection and transfer</i>	Make observations and measurements of several variables at the same time, or over time to help in scientific and geographical investigations	
	Select and use appropriate ICT tools to measure, collect and process data to support an investigation	
Suggested Evidence: <ul style="list-style-type: none"> - Softcopies or print-outs of pupils' work - Digital portfolio (e.g. pupil folder or project website) - Online journal (e.g. blog, forum, wiki, audioblog, podcast) 		
Cyberwellness Areas	Code	Skills and Values
Ethical and Legal Use	C4	Respect Intellectual Property
Safe and Responsible Use	C8	Verify Information Sources

Section B: Setting the Context

Setting the Context

In this section:

1. Planning Practices for HODs
2. ICT Integration Practices for Teachers

It is important for Heads of Department (HODs) and teachers to align ICT integration into the curriculum with the school vision and strategic directions. Effective planning practices to articulate the purpose of ICT integration, develop staff and manage processes and resources are also essential. It is also important for HODs and teachers to adopt innovative and creative teaching practices to create an environment that is positive, engaging and safe for learning as well as cater to pupils of different abilities.

This section provides some guidelines for HODs and teachers on how to prepare themselves and the school for ICT integration.

1. Planning Practices for HODs

To effectively implement the Baseline ICT Standards for pupils into the curriculum, it is suggested that HODs consider the following planning practices:

- | | |
|-----------------------------|--|
| a. Leadership | Set clear directions for ICT integration that contribute to the shared vision and foster an ICT culture. |
| b. Professional Development | Mentor and develop teachers in the use of ICT for teaching and learning. |
| c. Communication | Generate buy-in and involvement of both teachers and stakeholders, as well as provide opportunities for their input to improve the ICT integration plan. |
| d. Cyberwellness | Establish school-wide or department-wide Acceptable Use Policies ⁶ (AUPs) regarding the ethical and legal as well as safe and responsible use of ICT.

Raise awareness of the issues which could arise due to inappropriate use of ICT through education programmes, assembly talks and staff meetings. |

Annex B-1 provides in greater detail each of the planning practices for HODs. The different ways to provide professional development to teachers and establish communication with stakeholders are further elaborated in Section D.

⁶ Acceptable Use Policies (AUPs) are documents detailing the ways which ICT facilities can and cannot be used in school by pupils and staff. These documents should list procedures and support strategies for dealing with misuse.

Setting the Context

Annex B-2 provides a sample of an AUP and Annex B-3 provides a list of possible issues arising from inappropriate use of ICT.

2. ICT Integration Practices for Teachers

To prepare for implementation of the Baseline ICT Standards into the curriculum, it is important to create opportunities to allow every teacher to build on the following repertoire of ICT skills, pedagogical knowledge and practices:

- | | |
|---|--|
| a. ICT Skills | Display ICT skills as described in the Baseline ICT Standards for pupils. |
| b. Curriculum Design and Implementation | Plan, design, select appropriate ICT tools, implement effective ICT-based learning activities that support baseline ICT attainment for pupils. |
| c. Classroom Management Skills | Carry out effective ICT-based learning activities in an ICT-enabled learning environment. |
| d. Cyberwellness | Apply ethical and legal as well as safe and responsible use of ICT in classroom practices. |

Annex B-4 provides in greater detail the set of recommended ICT skills and practices for teachers. This could be referred to when conducting teachers' learning needs analysis.

Section C: Integrating ICT into Curriculum

Integrating ICT into Curriculum

In this section:

1. Curriculum integration considerations
2. Lesson design considerations

This section provides suggestions on how to integrate Baseline ICT Standards into the school curriculum and guidelines on how to design ICT-based lessons.

It is useful to review the existing ICT-based lessons which already have Baseline ICT Skills integrated so as to gain an idea of the Baseline ICT Skills that pupils have not been adequately exposed to. It will also help the school to ascertain the level of ICT integration within the school/department and the readiness of the staff and pupils, e.g. from the school's self-appraisal using the BY(i)TES tool⁷, so that school leaders can make plans to integrate the Baseline ICT Standards either in stages or as a whole school.

1. Curriculum Integration Considerations

A review of the existing ICT-based lessons across the different subjects and levels which already have Baseline ICT Skills integrated will help schools in planning for ways to ensure that opportunities for baseline ICT learning experiences are well-spread out across the curriculum. It is important for schools to consider both the school and department level when planning integration of Baseline ICT Standards.

a. School Level

i. Natural Fit

Different ICT tools and skills do present a more natural fit in certain subjects, topics and activities, as indicated in [Table C-1](#). It is important for each subject to capitalise on the natural opportunities for ICT integration into the curriculum and to plan for its use. This will maximise opportunities across the curriculum for pupils to acquire all the Baseline ICT Skills. However, this does not mean that teachers should limit themselves to the specified ICT skills for the subjects indicated in the table.

⁷ BY(i)TES stands for the **B**ench-marking **Y**our **I**CT Practices for **E**xcellence in **S**chools. It is a self-assessment tool to evaluate the level of ICT integration in schools.

Integrating ICT into Curriculum

Table C-1: Integration of ICT in Different Subjects

Baseline ICT Skills	Subjects			
	English	Mathematics	Science	Humanities
Basic Operations	★	★	★	★
Searches	★	★	★	★
Text	★		★	★
Online Communication	★			★
Multimedia	★	★	★	★
Spreadsheet		★	★	
Data Collection Tools	★	★	★	★

★ denotes where Baseline ICT Skills lend themselves naturally to application

ii. Pacing Pupil Involvement

Schools can plan to implement the Baseline ICT Standards to all the pupils in school concurrently or start with some groups of pupils first before extending to the rest of the school. For example, schools may start by implementing the Baseline ICT Standards at Lower Secondary before moving on to Upper Secondary.

iii. Opportunities for Practice

Acquisition of Baseline ICT Skills will be facilitated when pupils are given adequate opportunities to use the skills. Schools can look into different ways to integrate the Baseline ICT Standards into the curriculum and school programmes. Integration can take place in various subjects, project work and community involvement programmes, so as to increase the frequency pupils have to practise the skills.

iv. Readiness of Teachers and Pupils

Integration of the Baseline ICT Skills can be achieved through the use of different types of ICT tools. Schools can start with tools deemed manageable by teachers and pupils first before moving on to other less familiar tools.

b. Department Level

i. Within a Unit

Departments can plan and design for integration of Baseline ICT Skills into a series of lessons as a unit and not just as individual lessons. This allows Baseline ICT Skills to be integrated across a spread of lessons rather than to integrate many skills into a single lesson. Pupils will have more time to practise one Baseline ICT Skill before moving to the next.

Integrating ICT into Curriculum

Annex C-1 illustrates how the integration of Baseline ICT Skills is aided through a series of lessons within a unit of work.

ii. Across Different Levels

As a department, it is also useful to plan and design for integration of Baseline ICT Skills vertically across levels for similar or related topics. This creates a more natural and appropriate context for the integration of different ICT tools and resources in related activities. There will also be more opportunities for pupils to acquire and practise skills as they would have been taught to use specific ICT skills at one level and would be able to use the skills again with minimal instruction later in the level.

Annex C-2 illustrates how the integration of Baseline ICT Skills is aided through a series of lessons across levels.

2. Lesson Design Considerations

The design of a lesson often determines the kinds of learning that can take place and how learning is achieved. As ICT mediates new information and content in the classroom, teachers often find themselves taking on the role of an instructor as well as a facilitator. ICT lesson design can be based broadly on the following:

a. Structure and Behaviour

An activity's structure drives pupil's behaviour. The structure of an activity and the clarity of learning outcomes have a strong effect on pupil's behaviour. A well-designed lesson task will always reflect well-considered learning outcomes. The task should also encourage desired pupils' behaviour through examining task organisation, roles and rules, and physical environment. For example,

- Providing clearer instructions and objectives to pupils doing Internet search might help those with difficulty staying on task.
- Modifying the activity structure to have reporting points for pupils to check in their progress at every stage of the task helps provide scaffolding to aid the learning of all pupils.
- Defining pupils' roles in teams clearly in an activity can generally promote the correct behaviour and ensure better performance at tasks.
- Increasing the opportunities and spaces for interaction between pupils, as well as between pupils and teacher can allow closer monitoring.

Integrating ICT into Curriculum

Key question

How do we encourage desired outcomes?

Some considerations to meet desired outcomes are:

- State learning outcomes in measurable terms
- Set learning outcomes that are achievable in the lesson duration and reinforced in closure
- Design tasks that support the achievement of learning outcomes

b. Perception and Motivation

Pupils' perception shapes their motivation. A pupil's positive perception of a learning task usually results in strong self-directed learning that goes well beyond the classroom. For example,

- Tasks that are both personally relevant and within a pupil's means to accomplish can enhance motivation. Feedback through appropriately designed assessment helps to establish this perception.
- Pupils' readiness for the tasks expected can enhance motivation. This can be done through preparing pupils for the tasks, creating conducive learning environment, giving pupils access to quality tools and resources for self-paced discovery and helping pupils in setting personal targets.

Key question

How will pupils perceive and relate to the task?

Some considerations to help pupils perceive and relate to the task are:

Relevance

- Connect new information to pupils' prior knowledge
- Link assessment and measure it to the achievement of lesson objectives

Readiness

- Activate pre-requisite knowledge and skills
- Pitch lessons within pupils' general level of ability

Integrating ICT into Curriculum

c. Engagement and Learning

When pupils focus on an activity that is directed towards the learning outcomes, learning will naturally take place. Looking for different ways to trigger and sustain pupils' engagement to completion of a task is simpler and more effective than introducing a range of punishments and incentives.

ICT offers a diverse range of tools and resources to create exciting and experiential learning opportunities. Pupils can be engaged in different ways through different teaching and learning strategies, such as, inquiry-based learning and pupil groupings in various ICT-enabled learning environment. Employment of the following strategies can increase pupils' motivation to learn in the long run:

- Providing more learner-centred activities with varying levels of scaffolding for pupils.
- Setting authentic tasks.
- Stretching pupils' thinking with higher-order thinking questions.

Key question

How can pupils remain fully engaged?

Some considerations to help pupils remain fully engaged are:

ICT Use

- Give pupils opportunity to interact and apply ICT skills
- Use appropriate ICT tools that support learning outcomes

Teaching and Learning Strategies

- Use appropriate pedagogies that suit pupils' learning styles and readiness (e.g. cooperative learning, inquiry-based learning)
- Tap on real-world application or points of interest
- Stretch pupils' thinking (e.g. comparing, classifying, deducing, decision making, problem solving)
- Design tasks that encourage collaboration

Roles

- Ensure teachers' roles in instruction, guidance and facilitation are adequate
- Define pupils' roles in individual and collaborative learning clearly

Integrating ICT into Curriculum

Annex C-3 provides a lesson design checklist to facilitate the design of ICT-based lessons.

d. Value-add of ICT

To realise the full potential of ICT for teaching and learning, it is important to consider how ICT adds value to the learning process. Table C-2 summarises the general benefits of ICT use in relation to various facets of learning and are by no means exhaustive. After identifying the topics or concepts which are challenging, teachers and HODs can consider which facet of learning would be involved and then integrate the Baseline ICT Skills which will enhance learning.

Table C-2: Facets of Learning and Benefits of ICT Use

Facets of Learning	Benefits of ICT Use	Baseline ICT Skills Area
Understanding new/abstract concepts	Graphics displays make abstract concepts more concrete; pupils can manipulate systems to see how they work Visual examples clarify concepts and applications	Basic Operations and Learning With Searches - Use of simulations Learning with Multimedia - Use of animation and videos
Comparing different perspectives	Fast access to information	Learning With Searches - Use of Internet to locate, view and compare different accounts
Solving problems with real-world data	Fast access to information	Learning With Searches - Use of Internet to gather real-world data
Communicating with different audiences	Fast and efficient method of communication; especially to large audiences Inexpensive mode of communication	Learning With Communication Tools - Use of emails to write to a real audience
Tabulating and/or Analysing of information	Fast and efficient method of calculation; pupils can focus on analysing data and learning concepts instead of doing calculations manually	Learning With Spreadsheet - Use of spreadsheet to tabulate and/or calculate Learning With Text - Use of word processor to tabulate information or measurements
Editing of peer's work	Efficient method of including multiple annotations in a document	Learning With Text - Use of word processor to track editing

Integrating ICT into Curriculum

Facets of Learning	Benefits of ICT Use	Baseline ICT Skills Area
Recognising patterns	Manipulating variables to observe patterns	Learning With Spreadsheet <ul style="list-style-type: none"> - Use of spreadsheet to generate multiple examples - Sorting or filtering to observe patterns
Presenting data or findings	Ease of presenting and sharing multiple sources of information	Learning With Spreadsheet <ul style="list-style-type: none"> - Use of spreadsheet to generate graphical representations Learning With Text <ul style="list-style-type: none"> - Use of text and graphics in a report Learning With Multimedia <ul style="list-style-type: none"> - Use of media objects to enhance presentation
Collecting data	Fast access to information Fast and efficient method of data collection; pupils can focus on analysing data and observing patterns instead of collecting data manually Ability to record real-life data to enhance authenticity of lesson Ability to capture own voice for analysis of expressing emotions	Learning With Searches <ul style="list-style-type: none"> - Use of Internet to search for specific information Learning With Data Collection Tools <ul style="list-style-type: none"> - Use of dataloggers to measure physical quantities - Use of cameras to collect evidence - Use of sound recorder to record scripts

Annex C-4 provides ideas on how Baseline ICT Skills can be integrated into English, Mathematics, Science and Humanities lessons.

ETD has developed lesson resources that integrate Baseline ICT Skills and exhibit the value-add of ICT. These lessons integrate Baseline ICT Skills into the Primary and Secondary School curriculum.

Annex C-5a provides a sample P3 lesson on bar graphs to show how the lesson tapped on the use of spreadsheets to facilitate the recognition of patterns and analysis of information.

Annex C-5b provides a sample S2 lesson on narratives to show how the lesson tapped on the use of graphic organisers to facilitate the planning of an original story using a word processor.

More lessons are available in edu.MALL, specifically, the Baseline ICT Resources section at:

Integrating ICT into Curriculum

http://www.moe.gov.sg/edumall/tl/it_integration/baseline_ictr.htm⁸

The resources consist of lesson plans and materials such as worksheets and sample end products. They can be used directly or adapted, or simply as a source of new ideas.

e. ICT-enabled Learning Environment

In order to provide opportunities for every pupil to access and use computers in their learning, teachers would have to organise the class such that pupils have their turns to use the computers throughout the year.

The ICT-enabled learning environment is often determined by the infrastructure and established processes, as well as, the different grouping approaches in the lessons, as shown in Table C-3.

Table C-3: ICT-enabled learning environment

Grouping	ICT Use
Learning individually	<ul style="list-style-type: none"> - Computing would be necessary when pupils need to demonstrate individual mastery of skills or submit individual responses during the lessons. - This is usually done in the computer lab where there are sufficient computers for every pupil. - Computer notebooks may be pooled to form a mobile lab. - Examples of 1-1 computing without the full lab include: <ul style="list-style-type: none"> o Designing two different learning tasks where half the class will be involved in non-ICT activity while the other half uses the computers. Then they swap places and move on to the other task(s). o Use e-learning to achieve independent learning. Resources can be made available to pupils in the form of CD programs, video tutorials, and online self-paced ICT modules. This can be an effective complement to face-to-face teaching as well as provide opportunities for independent learning.
Learning in Pairs	<ul style="list-style-type: none"> - This arrangement allows collaboration between two pupils and peer tutoring where pupils help each other or a higher ability pupil helps a weaker pupil. - This can happen in a half lab, in the Media Resource Library, within or outside the classroom where notebooks are loaned out.
Learning in Groups	<ul style="list-style-type: none"> - Learning in groups provides opportunities for pupils to experience working in teams. - There is no need for a full lab. A computer notebook is given to each group so that learning can take place outside the classroom. - Another way to organise this is to have 5-6 computers stationed in the classroom (ICT Corners) for pupils' use. Most Media Resource Libraries in schools support such a learning strategy.

⁸ This URL is effective until Aug 2008. A new URL will be announced in due course.

Integrating ICT into Curriculum

After taking into account the considerations for curriculum integration and lesson design, departments can use the form in [Annex C-6](#) to submit information on the lessons they plan to integrate the skills in, and in so doing, help HOD ICT plan for the integration of Baseline ICT Standards in the school.

Section D: Supporting Implementation

Supporting Implementation

In this section:

1. Building Capacity
2. Optimising Resources
3. Managing Pupils' Behaviour
4. Updating Stakeholders

This section provides some support strategies to facilitate a smooth integration of the Baseline ICT Skills into the curriculum.

1. Building Capacity

a. Teachers and HODs

To build the capacity of teachers and HODs in ICT skills and ICT planning, schools can use the Professional Development Guides in [Annexes D-1](#) and [D-2](#) to identify the specific professional development needs.

[Annex D-3](#) is a sample ICT Learning Needs Analysis (LNA) for teachers which could be given in the beginning of the year to determine which Baseline ICT Skills they require training.

Both formal and informal professional development approaches should be adopted to address the needs of teachers and HODs. Some possibilities are shown in [Table D-1](#).

Table D-1: Possible Options for Professional Development of Teachers & HODs

Approach	Source(s)	Strategies
Training	<ul style="list-style-type: none"> - ETD - External ICT Trainers - Resident ICT Trainers - Training Videos/CD/Books 	<ul style="list-style-type: none"> - Mass training once or over a few times a year can be arranged by the cluster, school or department to induct or to reinforce basic ICT skills for teachers based on ICT plans - Training for individual teachers through TRASI workshops or workshops offered by training agencies such as Institute of Policy and Management (IPAM), and Workforce Development Agency (WDA) based on learning needs analysis - Self-paced learning through commercially produced training videos/CDs/books placed in the staff resource centre and uploaded on the school e-learning portal

Supporting Implementation

Approach	Source(s)	Strategies
Sharing	<ul style="list-style-type: none"> - ETD - Peers - Cluster - National Institute of Education (NIE) - External Agencies 	<ul style="list-style-type: none"> - Sharing of good ICT practices on a regular basis at cluster, staff, department meeting or during white space - Attending ICT Conferences and Seminars (e.g. International Conference on Educational Technology) on a regular or annual basis
Coaching	<ul style="list-style-type: none"> - Peers - Resident ICT Trainers 	<ul style="list-style-type: none"> - Mentoring and handholding teachers in developing their ICT skills and proficiency in teaching and learning <ul style="list-style-type: none"> o ICT champions being assigned at either per level or per subjects o Pairing of teachers across the staff o Co-teaching with ICT vendors in the beginning stage of integration to allow teachers to pick up the ICT skills on the job

b. Pupils

Different methods can be used to profile pupils' readiness in the use of ICT for learning. These include questionnaires, checklists and formal assessments. [Section E](#) on monitoring implementation and attainment provides some samples.

Once the general needs are determined, there are several options as suggested in [Table D-2](#) when organising training for pupils to enable them to participate fully in ICT-based lessons. A suggested Pupil Training Guide based on the Baseline ICT Standards is provided in [Annex D-4](#).

[Table D-2](#): Possible Options for Pupils' Training

Approach	Source(s)	Strategies	Time
Training	<ul style="list-style-type: none"> - External ICT Trainers - Resident ICT Trainers - Teachers 	<ul style="list-style-type: none"> - Training workshops by External ICT Trainers <ul style="list-style-type: none"> o Whether training should be compulsory or opt-in for the pupils depends on the level of ICT competencies of the pupils in the school. - Training sessions by Resident ICT Trainers <ul style="list-style-type: none"> o This taps on the experts to do the ICT 	<ul style="list-style-type: none"> - Can be conducted during: <ul style="list-style-type: none"> o school holidays o term time outside school hours, such as after mid-year or year-end examinations. For this, time should be kept short and under 2 h per session. Frequency can

Supporting Implementation

Approach	Source(s)	Strategies	Time
		<p>training. Teachers who are subject experts give inputs on the design of the learning tasks thus making learning relevant for pupils as it is done in the context of curriculum integration.</p>	<p>typically be once a week for every 4 weeks over a semester.</p> <ul style="list-style-type: none"> ○ school hours; about 30 min can be allocated weekly for the teaching of ICT skills by ICT trainers
		<ul style="list-style-type: none"> - Just-in-Time training <ul style="list-style-type: none"> ○ Teacher collaborates with ICT trainer to integrate ICT as planned in the Schemes of Work, i.e. teacher teaches the subject content while the trainer takes on the role of ICT trainer cum teacher-aide to teach the ICT skills to carry out the lesson activities, and support the teacher as a teacher-aide. ○ Trainer can be scheduled to come in for the first half hour of a lesson to equip pupils with skills they need to use in the later part of the lesson. Having sat in for the ICT training session, the teacher subsequently carries out the lesson with the trainer helping pupils with the newly acquired skills to carry out tasks assigned. 	<ul style="list-style-type: none"> - As required within school hours

Supporting Implementation

Approach	Source(s)	Strategies	Time
Coaching	- Peers	<ul style="list-style-type: none"> - Peer Assistance and Coaching <ul style="list-style-type: none"> o To increase the availability of ICT support in the classroom, pupils who are more ICT-savvy can be paired with those who are weaker within the class. o Can be planned for support across levels, or even between schools as part of Community Involvement Programme (CIP). 	<ul style="list-style-type: none"> - Ongoing within school hours - Can be part of CIP i.e. pupils serving as ICT coaches for younger pupils are given CIP hours

2. Optimising Resources

Resources refer to physical facilities, ICT tools and resources (both equipment and software) that can be used to support teaching and learning, as well as, manpower resources. Optimising resources is mainly about examining scheduling and deployment options. In looking at deployment, HODs can explore a range of ICT-enabled learning environment to support different types of lessons using different pedagogies.

a. ICT Facilities Management

Tables D-3 and D-4 describe possible approaches and strategies for managing available computer laboratories and ways of increasing the ICT-enabled learning area in schools to support the implementation of Baseline ICT Standards.

Supporting Implementation

Table D-3: Possible Approaches and Strategies for Allocation of Computer Laboratories

Approach	Strategies
Structured Lab Scheduling	<ul style="list-style-type: none"> - Subject-based Allocation <ul style="list-style-type: none"> ○ Can stagger usage periods based on the needs reflected in the respective departments' Schemes of Work. This assures lab time and less hassle in booking. ○ HODs (IP and ICT) can first identify usage patterns and curricular demands for ICT tools and resources by the various subjects. Then the ICT Committee or School Management Committee prioritises and co-ordinates usage decided during strategic planning. - Fixed Slots for Teachers <ul style="list-style-type: none"> ○ Can allocate fixed lab slots to teachers, e.g. 2 periods per subject, depending on the demands of the respective subject's Schemes of Work. ○ Teachers who need more lab time can co-ordinate with colleagues who are not using the facilities, and will then have to plan their lesson sequence to fully utilise the slots allocated. To increase the efficiency of the allocation, review the schedule every term to allow for adjustments. - Fixed Slots with Pairing <ul style="list-style-type: none"> ○ Can pair up teachers and allocate fixed slots based on the ICT demands for their subject. This works if there are teachers and subjects that use more ICT, and some that use less so that there can be more flexible arrangements between teachers. ○ Perfect fit during the pairing of teachers may not always be possible. A good approach is to start by pairing up the extremes in terms of highest and lowest usage.
Ad Hoc Booking	<ul style="list-style-type: none"> - Teachers are free to choose their own slot(s) for their lessons on a first come first served basis. It is good to establish a booking policy where teachers <ul style="list-style-type: none"> ○ Are reminded to book only when there is an ICT lesson ○ Cancel bookings early when there is a change of plan ○ Refrain from extensive block booking ○ Are given the maximum number of periods they may book per week or term
Hybrid Model	<ul style="list-style-type: none"> - Allocate fixed slots for some computer lab sessions and some slots free for teachers to book on an ad hoc basis.

Supporting Implementation

Table D-4: Possible Approaches and Strategies to Increase the Number of ICT-enabled Areas

Approach	Strategies
Mobile Lab	<ul style="list-style-type: none"> - Teachers can bulk-loan up to 40 notebooks for use in the classroom. - Schools adopting this system can customise a notebook storage that allows for centralised charging (e.g. a cupboard for 40 notebooks to be charged at the same time).
ICT Corners	<ul style="list-style-type: none"> - In classrooms <ul style="list-style-type: none"> o ICT corners with 5 to 10 computers can be set up in some classrooms (e.g. 1-2 such rooms per level) to facilitate collaborative learning. o Teachers can exchange classrooms when they need to use the classrooms with ICT corners. - In common areas <ul style="list-style-type: none"> o ICT corners with 5 or more computers can be set up in common areas, like the foyer or library, for pupils' use during and after curriculum time. o To prevent pupils from hogging the computers in the common areas, software to time usage can be installed in these computers.

b. ICT Equipment and Resources Allocation

Table D-5 describes the possible approaches and strategies to capitalise on the wide range of ICT equipment (e.g. dataloggers, computer notebooks and CD ROMs) available in schools to support the implementation of Baseline ICT Standards.

Table D-5: Possible Approaches and Strategies for ICT Equipment Allocation and Resources

Approach	Strategies
Centralisation	<ul style="list-style-type: none"> - A central control body (usually the ICT department) can keep all equipment and resources and loan them out to individuals when needed. It eases tracking, increases accountability and allows teachers to borrow a larger than normal number of equipment for special use (e.g. a lesson activity involving the use of 8-10 digital cameras). <p><i>Tip: Establish Standard Operating Procedures (SOPs), with clear policies of use and for the loan of equipment to reduce instances of hogging. For example, establishing a 'red-spot' system to manage resources meant for short term loan.</i></p>

Supporting Implementation

Approach	Strategies
De-centralisation	<ul style="list-style-type: none"> - Subject departments can hold on to some equipment and deploy them based on demand. For example, since dataloggers are used mainly by the Science department, these items can be held and accounted for by the Science department on a long term basis. - Subject departments can hold on to some equipment, such as computer notebooks, DVD players and even portable projectors to increase accessibility and responsiveness. <p><i>Tip: Establish SOPs for the loan of equipment within departments, across departments and loans to pupils. Review the utilization of resources within the department every half a year.</i></p>
Hybrid Model	<ul style="list-style-type: none"> - Some equipment can be placed under the charge of a central control body while others to be deployed to the respective departments. <p><i>Tip: Departments can keep separate inventories.</i></p>

Annex D-5 shows samples of ICT equipment loan forms.

c. Manpower Support

Besides ensuring that teachers have the physical facilities and equipment, provision of manpower to support teachers in integrating the Baseline ICT Standards in the classroom is equally important.

Enlisting the help of ICT-savvy pupils, technology assistants (TAs), Resident ICT Trainers, part-time staff, adjunct teachers and parent volunteers to set up ICT-enabled learning environment, assist weaker pupils or maintaining discipline are some ways to provide additional support to teachers conducting ICT-based lessons.

Supporting Implementation

Table D-6: Strategies for Manpower Support

Manpower	Scope of Support
Internal Sources	<ul style="list-style-type: none"> - Pupils as ICT Monitors <ul style="list-style-type: none"> ○ Assist weaker pupils during lessons - Pupils as Buddies <ul style="list-style-type: none"> ○ Aid peers who need ad hoc assistance during lessons
External Sources	<ul style="list-style-type: none"> - Teacher-aides <ul style="list-style-type: none"> ○ Can be part-time support staff or parent volunteers ○ Can co-design/conduct ICT lessons. - Technology Assistants (TAs) <ul style="list-style-type: none"> ○ Set up ICT-enabled learning environment ○ Troubleshoot technical problems - Parent Volunteers <ul style="list-style-type: none"> ○ Assist in any respect depending on capacity

3. Managing Pupils' Behaviour

Establishing classroom routines in an ICT-enabled learning environment is crucial to the delivery of successful ICT-based lessons. Establishing rules of expected behaviour for pupils in the classroom help pupils to focus on accomplishing learning tasks with minimal disruptive behaviour.

Annex D-6 provides a sample set of rules which teachers can enforce when conducting lessons in an ICT-enabled learning environment. For more classroom management strategies in an ICT-enabled learning environment, refer to <http://www.moe.gov.sg/edumall/tl/cms/index cms link.html>⁹

4. Updating Stakeholders

Keeping parents informed throughout the implementation process could encourage parents to play an active part to help pupils acquire the Baseline ICT Skills. Letters to keep parents updated on the skills training provided and attainment of Baseline ICT Skills through a pupil handbook are some ways to communicate to parents the progress of their children. Annex D-7 shows a sample page from a pupil ICT handbook.

⁹ This URL is effective until Aug 2008. A new URL will be announced in due course.

Section E: Monitoring Integration and Attainment

Monitoring Integration and Attainment

In this section:

1. Monitoring Baseline ICT Standards Integration
2. Reviewing Pupils' Attainment of ICT Skills

Schools can use a variety of strategies to monitor the integration of Baseline ICT Standards and review pupils' attainment of ICT skills. Monitoring integration provides a quick overview of the opportunities given to pupils to acquire Baseline ICT Skills. In order to determine the successful integration of Baseline ICT Standards into the curriculum, a structured approach to review pupils' attainment of skills is essential.

1. Monitoring Baseline ICT Standards Integration

Monitoring Baseline ICT Standards integration can be achieved at both school and department levels. A structured monitoring approach will allow schools to gain a comprehensive overview of the type and level of integration. The following are some monitoring strategies schools may consider adopting:

a. School Baseline ICT Skills Monitoring Matrix

Using a school Baseline ICT Skills monitoring matrix to determine the integration of Baseline ICT Standards would give the HOD ICT an overview of how each IP department has integrated Baseline ICT Standards into the curriculum. The HOD ICT can use the matrix to ensure co-ordination among departments. This ensures Baseline ICT Standards are integrated in and across the curriculum.

The monitoring matrix will present the number of lessons that Baseline ICT Skills have been integrated into the various subjects and levels. This will enable the HOD ICT to scan the areas of integration and to address any gaps. [Annex E-1](#) is an example of a matrix that can be used. It indicates the lesson activities that are used to monitor the implementation of baseline ICT lessons in a school.

This monitoring matrix could be put online or in the school network for teachers to indicate the details of the baseline ICT lessons they have conducted. This will help the HOD ICT to keep abreast of the baseline ICT integration and generate reports to monitor implementation. Screenshots of an online platform to monitor implementation can be found in [Annex E-2](#).

b. Department Baseline ICT Skills Monitoring Matrix

At the department level, HOD IP can monitor the integration of Baseline ICT Standards by using a matrix similar to the school monitoring matrix. [Annex E-3](#) shows an example of a department Baseline ICT Skills monitoring matrix to monitor the implementation of Baseline ICT Skills within a subject.

Monitoring Integration and Attainment

For more information on baseline ICT lessons conducted within subject areas, teachers could use their record books to record details of the baseline ICT lessons conducted, skill areas covered, ICT tools used and how they reviewed attainment of skills. They can also record post-lesson reflections, issues and concerns. Lessons integrating Baseline ICT Standards can be flagged for easy referencing and monitoring of implementation. [Annex E-4](#) shows a sample record book entry to monitor baseline ICT lessons.

Instead of using the record book, a feedback form could be given to teachers at the end of every term or semester to collect information on how many baseline ICT lessons they have conducted. The feedback form may also include fields for teachers to give their input on the difficulties of implementing baseline ICT lessons and the kind of support needed to move forward with baseline implementation. [Annex E-5](#) shows a sample feedback form.

2. Reviewing Pupils' Attainment of ICT Skills

Schools can adopt a mix of the following strategies for reviewing pupils' attainment of Baseline ICT Skills at the end of each key stage.

a. Teachers' Observations

The department identifies the lesson activities where pupils need to apply Baseline ICT Skills. Observations are then conducted to see if pupils are able to apply the skills.

[Annex E-6](#) shows a sample checklist to review the skills attainment of individual pupils.

b. Pupils' Artefacts

Besides observations, teachers can also collect pupils' printed assignments or artefacts created with ICT tools for grading. Such artefacts can be filed together with other class assignments and handouts in their subject files. Artefacts may be printed out in hardcopy for submission, or stored in the pupils' shared folder on the school server for teachers to access and view. A checklist may be developed for teachers to monitor the attainment of Baseline ICT Skills through the review of artefacts.

[Annex E-7](#) shows a sample rubric for project-based assessment of pupils' Baseline ICT Skills at specific task stages and in the end-product.

Another way to review the attainment of Baseline ICT Skills by pupils is to structure it in the form of school-wide or level-wide ICT competitions. Besides allowing the HOD ICT to review pupils' attainment of skills through pupils' artefacts, these ICT competitions of various categories (e.g. Internet Security, Digital Photo-editing) can help to raise interest in ICT skills.

Monitoring Integration and Attainment

Annex E-8 shows an ICT competition on Internet Security.

c. Pupils' Self-Perception Surveys

Schools can design a questionnaire to survey pupils' perception of their own attainment of ICT skills.

Annex E-9 shows a sample self-perception questionnaire for Key Stage 3. This survey can be administered at the beginning and at the end of the Key Stage to review the progress made by pupils. For example, a survey can be conducted at the beginning of the year for Secondary 1 pupils and at the end of Key Stage 3 for Secondary 2 pupils.

d. ICT Proficiency Tests

Proficiency tests that focus on the technical skills should be used together with other subject-based assessment strategies at the end of a Key Stage. The grades attained from the tests can be recorded in a pupil's report book.

Schools can develop their own tests or use those developed by ETD.

ICT proficiency tests have been developed by ETD for Key Stages 1, 2 and 3. These proficiency tests are available from edu.MALL¹⁰, specifically, the Baseline ICT Resources section at, http://www.moe.gov.sg/edumall/tl/it_integration/baseline_ictr.htm

Schools can also register pupils for tests administered by external accreditation bodies. Annex E-10 shows a list of ICT accreditation tests.

¹⁰ This URL is effective until Aug 2008. A new URL will be announced in due course.

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Elaboration of Baseline ICT Standards for Pupils (Version 4)

Primary 1 – 3			
Learning Objectives Pupils will 1. Gather and record information 2. Present information			
ICT Focus Pupils will 1. Perform basic ICT operations 2. Access digital resources 3. Create a short presentation with text and pictures			
Skill Areas	Code	Skills	Explanatory Notes
Basic Operations (K)	PK1	Navigate in a Graphical User Interface (GUI)	<ul style="list-style-type: none"> - Activate icons on computer desktop, application software (e.g. Internet browser) or digital resources (e.g. CD learning resource) - Move around within an application and digital resource
	PK2	Use application software and work with files	<ul style="list-style-type: none"> - Start and close application software - Open, save, print and close files (e.g. documents and presentations)
Learning With Searches (H) <i>Internet navigation and search</i>	PH1	Use digital resources from specified sources	<ul style="list-style-type: none"> - Digital resources include learning resources on the school network (e.g. e-learning portal) and those from the Internet (e.g. games, simulations) - Internet sources can be specified through given hyperlinks and URLs
Learning With Text (T) <i>Word processing</i>	PT1	Type short sentences or paragraphs	<ul style="list-style-type: none"> - Be familiar with keyboard - Type with proper positioning of fingers - Progress from typing letters to words, phrases, and then short sentences and paragraphs - Text includes numbers, punctuation marks, upper and lower case letters - Text should contain about 80 words
	PT2	Edit and format short sentences	<ul style="list-style-type: none"> - Remove letters using backspace and delete keys - Change colour of text - Change style of text: bold, underline, italics - Change size of text
Learning With Multimedia (M) <i>Production and manipulation of multimedia content</i>	PM1	Combine text with drawings or pictures in a presentation	<ul style="list-style-type: none"> - Presentation should contain about 1-3 slides - Insert given drawings (e.g. shapes) or pictures - Change size or position of drawings or pictures - Change colour of drawings
Suggested Evidence <ul style="list-style-type: none"> - Softcopies or print-outs of pupils' work 			

Elaboration of Baseline ICT Standards for Pupils (Version 4)

Primary 4 - 6

Learning Objectives

Pupils will

1. Gather and record information
2. Organise information
3. Communicate information and ideas
4. Recognise and address cyberwellness issues

ICT Focus

Pupils will

1. Use the Internet for email and searches
2. Create, edit and format text in word processors, spreadsheets and presentation tools
3. Produce a short presentation with available multimedia elements
4. Use ICT tools to collect data

Skill Areas	Code	Skills	Explanatory Notes
Learning With Searches (H) <i>Internet navigation and search</i>	PH2	Use search engines and keywords	<ul style="list-style-type: none"> - Locate information and resources (e.g. images, sound files) with search engines (e.g. Yahoo and Google) - Progress from providing keywords to having pupils use search engines on their own
Learning With Spreadsheet (S) <i>Data management and processing</i>	PS1	Create, edit and format tables of data	<ul style="list-style-type: none"> - Change information in cells - Format data according to data types: currency, date and decimal
	PS2	Use mathematical formulae	<ul style="list-style-type: none"> - Use simple formula with at least one basic operation (+, -, *, /)
Learning With Text (T) <i>Word processing</i>	PT3	Type paragraphs of text	<ul style="list-style-type: none"> - Type with proper positioning of fingers - Text includes numbers, punctuation marks, upper and lower case letters - Text should contain about 120 words (e.g. in an email or blog entry)
	PT4	Edit and format paragraphs of text	<ul style="list-style-type: none"> - Includes organising text (e.g. using bullets and headings)
	PT5	Create tables and edit content	<ul style="list-style-type: none"> - Content can consist of text or numbers
Learning with Multimedia (M) <i>Production and manipulation of multimedia content</i>	PM2	Create a multimedia presentation	<ul style="list-style-type: none"> - Presentation should contain about 4-6 slides - Combine text with sound or video files (provided for or sourced by pupils)
Learning with Communication Tools (C) <i>Online communication</i>	PC1	Send a message	<ul style="list-style-type: none"> - Read and reply an email - Can include use of social community spaces such as blogs
	PC2	Send an attachment	<ul style="list-style-type: none"> - Compose a message with an attachment (e.g. presentation file, sound file)
Learning With Data Collection Tools (D) <i>Data collection and transfer</i>	PD1	Record pictures, sound, video or data using ICT tools	<ul style="list-style-type: none"> - ICT tools may include microphones, digital cameras and scanners, or dataloggers - Editing of pictures, sound and videos is not required

Elaboration of Baseline ICT Standards for Pupils (Version 4)

Primary 4 - 6

Suggested Evidence:

- Softcopies or print-outs of pupils' work
- Digital portfolio (e.g. pupil folder or project website/blog)

Cyberwellness Areas	Code	Skills and Values	Explanatory Notes
Ethical and Legal Use	C1	Handle Inappropriate Content	<ul style="list-style-type: none"> - Recognise and avoid inappropriate content which are socially or morally unacceptable (e.g. pornographic, hate and violent materials, gambling) - Respond appropriately (e.g. close window, talk to a counsellor) when encountering materials that are disturbing - Report access to illegal or unsuitable material on the Internet
	C2	Prevent Cyber Abuse	<ul style="list-style-type: none"> - Recognise potential dangers (e.g. psychological dependency in virtual relationships, sexual grooming and exploitation) and take precautions when dealing with cyber contacts - Recognise and report situations of unethical and exploitative use (e.g. cyberbullying, indecent propositions, hate blogs) to a trusted adult or authority
	C3	Display Internet Etiquette	<ul style="list-style-type: none"> - Observe Internet etiquette (netiquette) in communication (e.g. use appropriate language, demonstrate mutual respect)
	C4	Respect Intellectual Property	<ul style="list-style-type: none"> - Recognise and abide by copyright regulations
Safe and Responsible Use	C5	Protect Private Information	<ul style="list-style-type: none"> - Implement procedures or guidelines for personal safety and security (e.g. accessing networks through proper means, not sharing passwords, setting strong passwords to prevent hacking)
	C6	Avoid Computer Addiction	<ul style="list-style-type: none"> - Recognise the impact of games addiction and be aware of strategies to avoid it

Elaboration of Baseline ICT Standards for Pupils (Version 4)

Secondary 1 – 2

Learning Objectives

Pupils will

1. Gather and record information independently
2. Examine, organise and use information and digital resources
3. Present and communicate information and ideas
4. Recognise and address cyberwellness issues (skills and values from earlier key stage should be continuously reinforced)

ICT Focus

Pupils will

1. Use the Internet for communication and searches
2. Create, organise and lay out text in word processors, spreadsheets and presentation tools
3. Produce multimedia elements using a simple application software
4. Create links to access a variety of data sources
5. Set up ICT tools to collect and process data

Skill Areas	Code	Skills and Values	Explanatory Notes
Basic Operations (K)	SK1	Operate in an interactive media environment	- Manipulate data or objects in an interactive digital environment (e.g. applets, Geometer's Sketchpad, simulations) to fulfil a task
Learning with Searches (H) <i>Internet navigation and search</i>	SH1	Use search engines and keywords independently	- Identify and use keywords in searching - Obtain information from online sources and directories (e.g. news, journals, blogs, books, reviews, forums, libraries, encyclopedias)
Learning with Spreadsheet (S) <i>Data management and processing</i>	SS1	Create, edit and format graphs or charts	- Manipulate data (e.g. using Excel, Graphic Calculators,) and represent it on charts (e.g. pie, bar) or graphs (e.g. line) - Includes labels for graphs and charts, i.e. title and axes
	SS2	Use built-in functions to process data	- Use built-in functions (e.g. Σ , sum) and mathematical formulae with basic operations (+ - * /)
Learning with Text (T) <i>Word processing</i>	ST1	Create pages of text	- Text should span more than 1 page (e.g. reports, journals, portfolios) - Text can include tables, diagrams (e.g. shapes and lines, organisers) and pictures
	ST2	Edit and format pages of text	- Edit page layout (e.g. page numbering, paragraphing, alignment)
Learning with Multimedia (M) <i>Production and manipulation of multimedia content</i>	SM1	Produce multimedia elements	- Edit a multimedia element (e.g. crop image, shorten or combine sound or video files) using a simple application (e.g. MS PowerPoint, Windows Sound Recorder, iMovie, Windows Movie Maker)
	SM2	Create presentation with hyperlinks	- Hyperlink to websites, online hosted files (e.g. videos, music, documents) - Use buttons, images or text as navigational aids to organise information (e.g. within a webpage, blog, PowerPoint)
Learning with Communication Tools (C) <i>Online communication</i>	SC1	Communicate online	- Use applications or devices to communicate over a network or the Internet (e.g. chat, forums, wikis, blogs, facebook)

Elaboration of Baseline ICT Standards for Pupils (Version 4)

Secondary 1 – 2			
Learning with Data Collection Tools (D) <i>Data collection and transfer</i>	SD1	Export data collected	<ul style="list-style-type: none"> - Transfer data or media from a device (e.g. datalogger, scanner, digital camera, mp3 recorder) to a computer - Move data or media into an application (e.g. spreadsheet, photo editor, blog, photo gallery)
Suggested Evidence: <ul style="list-style-type: none"> - Softcopies or print-outs of pupils' work - Digital portfolio (e.g. pupil folder or project website) - Online journal (e.g. blog, forum, wiki, audioblog, podcast) 			
Cyberwellness Areas	Code	Skills and Values	Explanatory Notes
Ethical and Legal Use	C4	Respect Intellectual Property	<ul style="list-style-type: none"> - Recognise IP rights and ways to secure use of copyrighted material (e.g. requesting permission for using pictures or songs)
Safe and Responsible Use	C5	Protect Private Information	<ul style="list-style-type: none"> - Recognise types of personal information that cannot be shared online to protect against exploitation (e.g. specific information leading to precise identification, identity theft through phishing sites)
	C6	Avoid Computer Addiction	<ul style="list-style-type: none"> - Recognise the different forms and impact of computer addiction (e.g. Instant Messaging, network gaming) - Understand how to maintain a balanced use of technology and prevent addiction
	C7	Manage Security Risks	<ul style="list-style-type: none"> - Recognise a range of security hazards (e.g. viruses, spyware, spam) on the Internet and their consequences (e.g. data loss, financial loss through scams) - Know how to prevent and minimise security risks in different online situations (e.g. opening email attachments, installing free downloads, activating pop-ups)
	C8	Verify Information Sources	<ul style="list-style-type: none"> - Check a variety of sources to avoid being misled or manipulated through misinformation and biased reporting (e.g. sites supporting unwholesome or unsafe activities like anorexia or extreme religious or political views)

Elaboration of Baseline ICT Standards for Pupils (Version 4)

Secondary 3 – 5 / Pre-University	
Learning Objectives Pupils will <ol style="list-style-type: none"> 1. Revise information-gathering strategies to retrieve and organise information from various sources 2. Evaluate information in terms of credibility and relevance for a specific purpose 3. Present and communicate information and ideas clearly 4. Address cyberwellness issues (skills and values from earlier key stages should be continuously reinforced) 	
ICT Focus Pupils will be proficient in the following: <ol style="list-style-type: none"> 1. Locate, evaluate and synthesize reliable information from multiple Internet sources 2. Manipulate multimedia elements and create a range of media products 3. Use online and network means to communicate, collaborate and distribute media within and beyond the classroom 4. Employ ICT tools independently to collect and process different kinds of data and media 	
Skill Areas	Examples of Application
Learning with Searches (H) <i>Internet navigation and search</i>	Locate, select and use resources (e.g. online public libraries, encyclopedias) to enhance learning of curriculum topics (e.g. simulation to explore the effects of changing conditions such as a Tsunami)
	Use and analyse (e.g. compare and contrast) information from various sources to complete assignments and project work
Learning with Spreadsheet (S) <i>Data management and processing</i>	Process data and interpret results to draw inferences (e.g. number patterns and what if analysis)
	Plan and design spreadsheets based on a scenario to solve a problem (e.g. which loan package to purchase)
Learning with Text (T) <i>Word processing</i>	Use the word processor frequently with accuracy and efficiency to complete assignments
	Organise ideas for different purposes (e.g. publications such as newsletters, pamphlets and reports)
Learning with Multimedia (M) <i>Production and manipulation of multimedia content</i>	Use the presentation tool frequently to organise and present information and ideas
	Produce multimedia presentations using a variety of media elements to illustrate ideas to targeted audiences (e.g. digital story)
Learning with Communication Tools (C) <i>Online communication</i>	Use ICT tools frequently to exchange information and data collected with peer, teachers, experts, groups of people and organisations (e.g. brainstorming and discussing ideas on forums, social networks)
	Communicate and collaborate in ways appropriate to the task and audience (e.g. use blogs or wikis for expressing personal or group views)
Learning with Data Collection Tools (D) <i>Data collection and transfer</i>	Make observations and measurements to monitor several variables at the same time, or over time to help in scientific and geographical investigations
	Select and use appropriate ICT tools to measure, collect and process data to support an investigation (e.g. collect sound and images to recreate rainforest ecology online)

Elaboration of Baseline ICT Standards for Pupils (Version 4)

Secondary 3 – 5 / Pre-University

Suggested Evidence:

- Softcopies or print-outs of pupils' work
- Digital portfolio (e.g. pupil folder or project website)
- Online journal (e.g. blog, forum, wiki, audioblog, podcast)

Cyberwellness Areas	Code	Skills and Values	Explanatory Notes
Ethical and Legal Use	C4	Respect Intellectual Property	- Practise common ethical guidelines and conventions in using and presenting information content (e.g. crediting sources, citing references, bibliographies, rejecting plagiarism, presenting accurate information)
Safe and Responsible Use	C8	Verify Information Sources	- Consult reliable sources in research and verify the accuracy, currency and completeness of information across a range of sources

ICT Planning Practices for HODs (Version 4)

Areas	Descriptors	Explanatory Notes
Leadership	<p>HODs lead and set clear directions for ICT integration that contribute to the shared vision for ICT integration and foster an ICT culture:</p> <p><u>Strategic ICT Planning (HOD ICT)</u></p> <ul style="list-style-type: none"> - Conduct internal and external scan to assess current situation in order to bridge the gap between current reality and desired outcome - Plan and develop a single school's ICT plan that incorporates the different department ICT-integrated work plans - Develop synergy between different department ICT plans - Review the implementation of school ICT plan using self-evaluation tools <p><u>Instructional Leadership (HOD IP)</u></p> <ul style="list-style-type: none"> - Source and recommend ICT resources that can support curricular goals - Plan, develop and implement an ICT-integrated department plan for pupil centred learning - Integrate use of ICT into Schemes of Work - Review the implementation of the ICT-integrated department work plan 	<ul style="list-style-type: none"> - For HOD ICT - refer to ICT integration for the whole school - For HODs IP - refer to ICT integration for a department <ul style="list-style-type: none"> - Internal scan can include 5 areas: Leadership and School ICT culture, pupil and teacher use of ICT for learning, Professional Development, Management of ICT and Financial Resources and Community Connections (in alignment with BY(i)TES) - External scan includes an ICT scan which finds out the ICT resources available which support or enhance teaching and learning - Include strategies for pupils' training and ICT infrastructure <ul style="list-style-type: none"> - Department or school ICT plan should include 4 components: ICT in curriculum, professional development, physical infrastructure and budget allocation. This can form part of the department work plan
Professional Development	<p>HODs mentor and develop teachers in the use of ICT for teaching and learning:</p> <ul style="list-style-type: none"> - Demonstrate use of ICT in developing pupils' higher order thinking skills, reviewing pupils' learning and in a variety of ICT-enabled learning environment - Guide teachers and provide them feedback as they design ICT-based learning activities and manage ICT-enabled learning environment 	<ul style="list-style-type: none"> - ICT-enabled learning environment include computer laboratories, ICT resource rooms, school media resource libraries and areas with wireless set-up - Managing ICT-based learning activities refers to establishing routines and incorporating teaching strategies to ensure the effective implementation of

ICT Planning Practices for HODs (Version 4)

Areas	Descriptors	Explanatory Notes
	<ul style="list-style-type: none"> - Guide teachers in the ongoing development of ICT knowledge and skills <ul style="list-style-type: none"> o Conduct regular learning needs analysis in the domain of ICT for teaching and learning o Plan and organise professional development programmes for teachers based on their needs 	<ul style="list-style-type: none"> - the lesson in an ICT-based learning environment - Demonstration can be done through observations of the actual lesson being conducted or a sharing at staff contact time, or department sharing - Professional development programmes include both formal and informal modes, e.g. workshops, peer observations and coaching
Communication	<p>HODs generate buy-in and involvement of both teachers and stakeholders, as well as provide opportunities for their input to improve the ICT plan</p>	<ul style="list-style-type: none"> - Build various communication strategies to reach the teachers and stakeholders, e.g. assemblies, meetings, white space, newsletters letters and parent volunteer programmes - Involve teachers and stakeholders in all stages: planning, implementation and evaluation - Share goals with teachers and stakeholders - Keep teachers and stakeholders updated throughout the implementation process in order to build support for future efforts
Cyberwellness	<p>HODs establish platforms to ensure ethical and legal as well as safe and responsible use of ICT in the classrooms:</p> <ul style="list-style-type: none"> - Establish school-wide or department-wide Acceptable Use Policies (AUPs) - Arrange educational programmes and assembly talks to raise awareness of appropriate use of ICT 	<ul style="list-style-type: none"> - Address possible issues arising from inappropriate use of ICT (Refer to Annex B-3)

Acceptable Use Policies (AUPs)

The following is a sample of an AUP:

Dear Pupil,

Computers are used to support and enhance learning. Internet access allows you to share resources, innovations, experiences and interact with people from all over the world.

1. Use your user account in an ethical, legal, safe and responsible manner.
2. You are encouraged to use your user account in support of education and research activities.
3. You are responsible for the use of your user account. Choose a password that is difficult for others to guess. Do not share your user account with others or use any account that does not belong to you.
4. Report any possible security loophole of this system to the system administrators. If you are unsure, report it. Do not use it.
5. Do not use your user account for any illegal activities. These include making unauthorised attempts to gain access to any account not belonging to you, hacking into computer systems, spreading computer viruses or sending undesirable materials.
6. Do not use your school's user account for any financial gain and commercial activities.
7. Do not copy any commercial software in violation of copyright laws.
8. Do not send unsolicited e-mails or participate in electronic chain letters. Impersonation, anonymity, or use of pseudonyms is not permitted.
9. Please keep in mind that many people are sharing this system. Log off immediately when you are not using your user account.
10. The Internet system administrators generally do not monitor your usage or look at data in your user account. However, if there is evidence of illegal or unethical use, the Internet system administrators reserve the right to inspect or perform searches on the contents in your user account.

Failure to adhere to the policy and guidelines above may result in the suspension or revocation of your user account. In serious cases, you may also face disciplinary action in school and/or prosecution in the court of law if you use your user account for illegal purposes.

Acceptable Use Policies (AUPs)

Dear Sir/Mdm,

I understand and will abide by the provisions and conditions of the Internet Acceptable Use Policy and realise my user account is designed for educational purposes only. I understand that any violation of the above provisions may result in disciplinary action, the suspending/revoking of my user account, and any appropriate action.

Pupil's Name:

NRIC No:

Pupil's Signature:

Date:

(Adapted from MOE's Internet Acceptable Use Policy by Information Technology Branch)

Cyberwellness

Cyberwellness issues can be classified into 2 broad areas:

- Ethical and Legal Use
- Safe and Responsible Use

The table below provides the list of cyberwellness issues in each of the category. Schools can refer to this list when establishing cyberwellness Acceptable Use Policies (AUPs) and designing cyberwellness programmes for pupils.

Skills and Values	Explanatory Notes
Ethical and Legal Use	
Handle Inappropriate Content	<ul style="list-style-type: none"> - Recognise and avoid inappropriate content which are socially or morally unacceptable (e.g. pornographic, hate and violent materials, gambling) - Respond appropriately when encountering materials that are disturbing (e.g. close window, talk to a counsellor) - Report access to illegal or unsuitable material on the Internet
Prevent Cyber Abuse	<ul style="list-style-type: none"> - Recognise potential dangers and take precautions when dealing with cyber contacts (e.g. psychological dependency in virtual relationships, sexual grooming and exploitation) - Recognise and report situations of unethical and exploitative use to a trusted adult or authority (e.g. cyberbullying, indecent propositions, hate blogs)
Display Internet Etiquette	<ul style="list-style-type: none"> - Recognise and abide by copyright regulations - Observe Internet etiquette (netiquette) in communication (e.g. use appropriate language, demonstrate mutual respect)
Respect Intellectual Property	<ul style="list-style-type: none"> - Recognise IP rights and ways to secure use of copyrighted materials (e.g. requesting permission for using pictures or songs) - Practise common ethical guidelines and conventions in using and presenting information content (e.g. crediting sources, citing references, rejecting plagiarism, presenting accurate information)
Safe and Responsible Use	
Protect Private Information	<ul style="list-style-type: none"> - Implement procedures or guidelines for personal safety and security (e.g. accessing networks through proper means, not sharing passwords, setting strong passwords to prevent hacking) - Recognise types of personal information that cannot be shared online to protect against exploitation (e.g. specific information leading to precise identification, identity theft through phishing sites)

Cyberwellness

Skills and Values	Explanatory Notes
Avoid Computer Addiction	<ul style="list-style-type: none"> - Recognise the impact of games addiction and be aware of strategies to avoid it - Recognise the different forms and impact of computer addiction (e.g. Instant Messaging, network gaming) - Understand how to maintain a balanced use of technology and prevent addiction
Manage Security Risks	<ul style="list-style-type: none"> - Recognise a range of security hazards on the Internet and their consequences (e.g. viruses, spyware, spam) - Know how to prevent and minimise security risks in different online situations (e.g. opening email attachments, installing free downloads, activating pop-ups)
Verify Information Sources	<ul style="list-style-type: none"> - Check a variety of sources to avoid being misled or manipulated through misinformation and biased reporting (e.g. sites supporting unwholesome or unsafe activities like anorexia or extreme religious or political views) - Consult reliable sources in research and verify the accuracy, currency and completeness of information across a range of sources

ICT Skills and Planning Practices for Teachers (Version 4)

Areas	Descriptors	Explanatory Notes
Information and Communication Technology	Teachers are able to display the ICT skills as described in the Baseline ICT Standards for pupils	<ul style="list-style-type: none"> - Focus first be on ICT skills relevant to 1 or 2 specific subject area(s)
Curriculum Design and Implementation	<p>Teachers plan, design, select appropriate ICT tools, implement effective ICT-based learning activities in line with curricular outcomes and that support baseline ICT attainments for pupils:</p> <ul style="list-style-type: none"> - Search, evaluate and use appropriate ICT tools and resources to support learning - Adopt and adapt available ICT-based lesson ideas to support and assess pupils' learning - Design ICT-based learning activities that support pupil-centred learning - Manage ICT-based learning activities in different types of ICT-enabled learning environment 	<ul style="list-style-type: none"> - ICT tools include the common application/software and hardware (e.g. Internet search engines, word processors, spreadsheet tools, presentation tools, media editing tools, data probes, digital cameras, sound capturing devices, scanners) - ICT resources include those from CDs and Internet, as well as, those digital resources developed and shared by teachers within and across schools - Start with adopting and adapting learning activities from available lesson ideas and plans, either from colleagues or Internet, before designing ICT-based learning activities - Design ICT-based learning activities that provide sufficient scaffolding and constructive feedback to pupils (Note: Creating digital resources, such as animation and simulations, using application software such as Macromedia Flash, is not required of teachers) - ICT-enabled learning environment include computer laboratories, ICT resource rooms, school media resource libraries and any where (if there is wireless set-up) in the school <p>Managing ICT-based learning activities refers to establishing routines and incorporating teaching strategies to ensure the effective implementation of the lesson in an ICT-enabled learning environment</p>

ICT Skills and Planning Practices for Teachers (Version 4)

Areas	Descriptors	Explanatory Notes
Classroom Management Skills	Teachers are able to carry out effective ICT-based learning activities in an ICT-enabled learning environment	<ul style="list-style-type: none"> - Develop classroom routines and strategies that help pupils to focus on accomplishing learning tasks with minimal disruptive behaviour
Cyberwellness	<p>Teachers understand and apply ethical and legal as well as safe and responsible use of ICT in classroom practices:</p> <ul style="list-style-type: none"> - Model and teach ethical and legal as well as safe and responsible use of ICT - Implement classroom procedures that guide pupils' ethical and legal as well as safe and responsible use of ICT 	<ul style="list-style-type: none"> - Use ICT resources in a safe and responsible way - Procedures include templates for seeking and recording the permission for the use of resource(s) from owners, insisting on bibliographies, and good etiquette in using email

Planning for ICT Integration Within a Unit

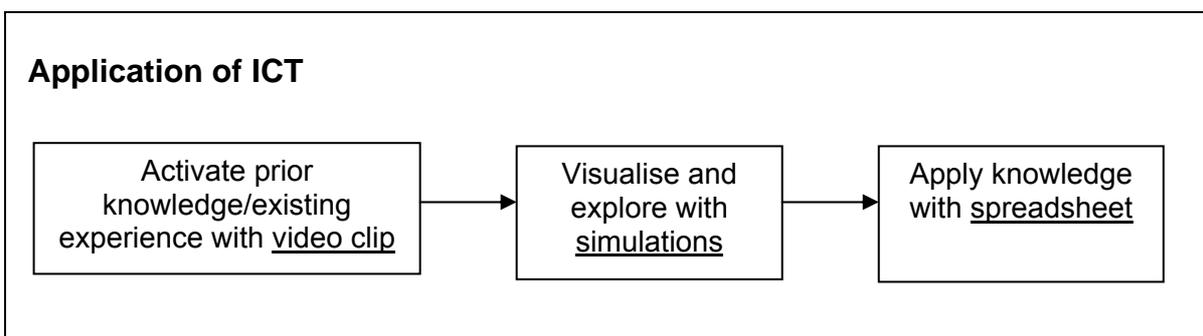
Example 1: Mathematics (Primary)

In the Primary 3 unit of Fractions, 4 lessons were developed for the following learning outcomes:

- Interpretation of fraction as part of a whole
- Reading and writing fractions
- Comparing and ordering of unit fractions and like fractions

Lesson 1 [P3 Fractions]	<ul style="list-style-type: none"> - Using a video clip to present fractions in real life scenarios (e.g. sharing of a cake between 2 persons) to pupils connect their experiences to the concept of fractions. Pupils learn that fractions are equal parts of a whole. - Pupils then explore the relationship between the numerators and denominators using a simulation, and thereby learn to associate unit fractions to pictorial representations.
Lesson 2 [P3 Fractions]	<ul style="list-style-type: none"> - Using another simulation, pupils build on their initial concept and knowledge of fractions to learn about sizes of fraction through comparing unit fractions visually. This enables them to order the fractions according to their sizes.
Lesson 3 [P3 Fractions]	<ul style="list-style-type: none"> - Pupils next apply the concept of fractions acquired in the previous lessons to interpret given fractions and write down the non-unit fractions, verifying their responses with the help of the simulations.
Lesson 4 [P3 Fractions]	<ul style="list-style-type: none"> - Finally, pupils represent given fractions pictorially by colouring cells in a spreadsheet template.

Through these 4 lessons, pupils would have a number of opportunities to navigate in a Windows environment, use digital resources from the Internet and type words using the keyboard.



Planning for ICT Integration Within a Unit

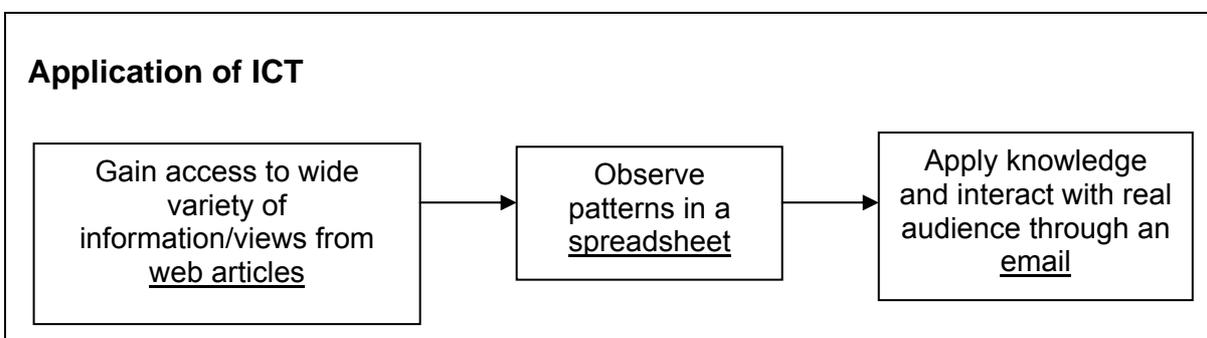
Example 2: English (Primary)

In the Primary 5 unit of Choosing an Occupation, 2 lessons were developed for the following learning outcomes:

- Focus on skills specific to the reading of informational texts/selections
- Develop an awareness of features and functions of parts of speech in functional texts like email
- Write using a variety of text types for a variety of purposes, audiences and tones

Lesson 1 [P5 Choosing an Occupation (I)]	<ul style="list-style-type: none"> - Pupils search for and read web articles, scanning for job demands of chosen professions. - Pupils rate their personality/talents in a spreadsheet activity. They then rank the identified job demands to observe patterns that suggest the best job fit for their own personality/talents.
Lesson 2 [P5 Choosing an Occupation (II)]	<ul style="list-style-type: none"> - Relating to their selected job, pupils write an email requesting for more information, applying the correct modals/auxiliary verbs. They then send their email to the teacher or real audience where appropriate.

Through these 2 lessons, pupils would have a number of opportunities to search for digital resources from the Internet, type paragraphs of text and send email messages.



Planning for ICT Integration Within a Unit

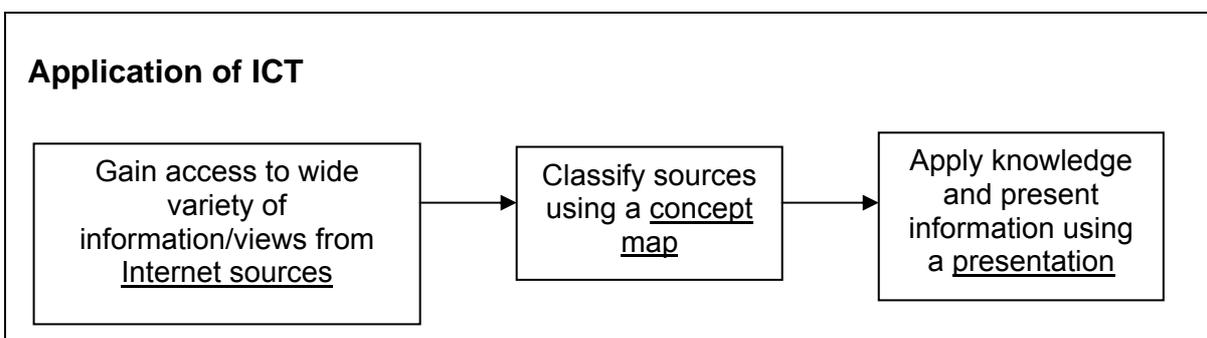
Example 3: History (Secondary)

In the Secondary 1 unit of Investigating the Past, 2 lessons were developed for the following learning outcomes:

- Differentiate the types of sources used to interpret history
- Assess the reliability of sources used to interpret history

Lesson 1 [S1 Investigating the Past (I)]	<ul style="list-style-type: none"> - Using a set of questions provided by the teacher, pupils determine if a given list of Internet sources on history are primary or secondary sources. - Pupils then classify these sources using a concept map and present their findings to the class.
Lesson 2 [S1 Investigating the Past (II)]	<ul style="list-style-type: none"> - Pupils learn the criteria for assessing reliability through an activity involving differing accounts from a football match. - After learning these criteria, pupils choose one of the Internet sources from Lesson 1 and search the Internet for other sources that help assess its reliability. - Pupils then prepare a PowerPoint presentation to present their findings.

Through these 2 lessons, pupils would have a number of opportunities to search for historical information from the Internet, use a concept map and prepare a presentation.



Planning for ICT Integration Within a Unit

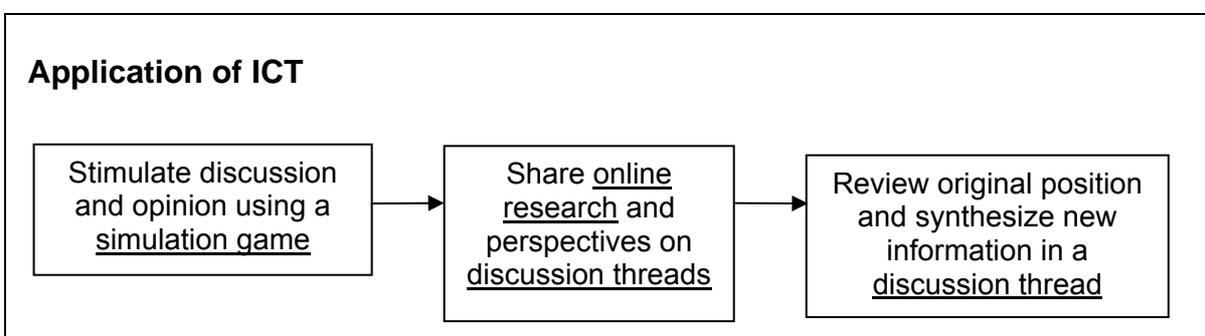
Example 4: English (Secondary)

In the Secondary 2 unit of Expository Writing and the theme of Conflict, 3 lessons were developed for the following learning outcomes:

- View and interact to obtain understanding of the experiences of others through an interactive game and video clip
- Present a coherent exposition on the issue of intervention
- Take a position on an issue, with a focus on the conclusion

Lesson 1 [S2 Exposition (II)]	<ul style="list-style-type: none"> - From their experience of life as a refugee in the simulation game ‘Darfur is Dying’, pupils reflect on conflict issues and post their reactions online. - Pupils are then led to think about intervention issues and state an initial position on a forum thread as the start to expository writing.
Lesson 2 [S2 Exposition (III)]	<ul style="list-style-type: none"> - Pupils compare their experiences playing the simulation game and watching a Youtube video on life as a Dafuri refugee and discuss the impact of different media. - They consider a position to hold on an issue, and through online group discussion and Internet research, construct and review arguments for and against it.
Lesson 3 [S2 Exposition (IV)]	<ul style="list-style-type: none"> - Having considered a range of perspectives and reasons on the issue of intervention, pupils engage in a class debate before formulating their conclusion on a forum thread as a final revision of their stand.

Through these 3 lessons, pupils would have a number of opportunities to reflect on real-world problems through a simulated gaming environment, use search engines for researching on issues, communicate and collaborate online to develop and refine personal perspectives and arguments.



Planning for ICT Integration Across Levels

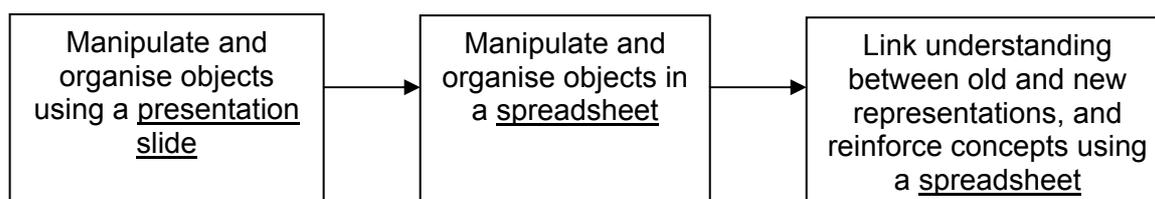
Example 1: Mathematics (Primary)

The concept of data collection, organisation and graphical representations of data with scales are spread over 3 years, starting with data collection and organisation in Primary 1.

Below shows how the integration of ICT considered the learning outcomes across the 3 levels for a unit. To build on pupils' familiarity of the concept and skills needed for the tasks, pupils progress from manipulating and organising objects in a presentation slide in Primary 1 to exploring several auto-check spreadsheet in Primary 2. Pupils then generate graphs using spreadsheet to check their understanding in interpreting the different types of graphs in Primary 2 and 3.

Primary 1 [P1 Picture Graphs (I) – Introduction: Simple Picture Graphs]	- Given sets of digital objects in a presentation slide, pupils explore ways to organise the digital objects so that information can be read easily. Through this, pupils learn that picture graph is one effective way of organising and representing data.
Primary 2 [P2 Picture Graph (I) – Making Picture Graphs with Scales]	- Building on the knowledge of picture graphs, pupils are exposed to a similar activity where they explore with numerous examples created using an auto-check spreadsheet to learn the concept of scale representation in a picture graph.
Primary 3 [P3 Bar Graph]	- By observing and comparing the pairs of picture graphs and bar graphs generated by a spreadsheet, pupils draw a connection between their prior knowledge of picture graphs to a new form of graphical representation (i.e. bar graphs).

Application of ICT



Planning for ICT Integration Across Levels

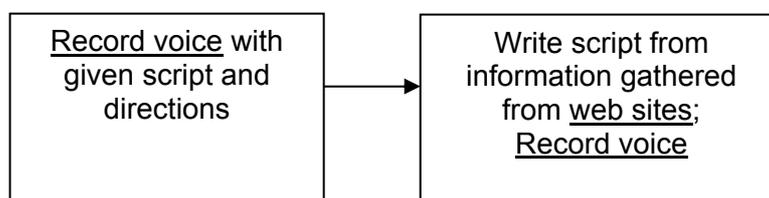
Example 2: English (Primary)

The expression of different meanings using appropriate vocal parameters (e.g. stress patterns, rhythm and intonation) is tackled over all 6 years of Primary education.

Below shows how the integration of ICT addressed the learning outcomes across 2 levels.

Primary 4 [P4 Indian Folk Tales]	- From a set of presentation slides, P4 pupils listen to three sentences read with different emphases (expressing different meanings). Given segments from a play (as well as stage directions), pupils record these segments by varying pitch, volume and rhythm to express the intended meaning.
Primary 5 [P5 Clowns and Magicians]	- Building on their knowledge of vocal parameters, P5 pupils are exposed to a similar activity where they now write on their own an introductory speech (based on information gathered from web sites) and record their speech, using vocal parameters to build up excitement for the performance.

Application of ICT



Planning for ICT Integration Across Levels

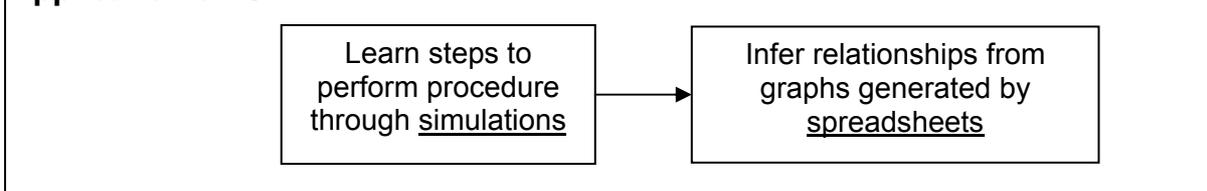
Example 3: Mathematics (Secondary)

Pupils learn to read coordinates on a Cartesian plane, plot and learn properties of graphs of linear functions in Secondary 1 using spreadsheets. They then apply the skills to learn the properties of graphs of quadratic functions in Secondary 2, followed by graphs of other non-linear functions in Upper Secondary.

Below shows how the integration of ICT addresses the learning outcomes across the levels for the unit. To build on pupils' familiarity of the concept and skills needed for the tasks, pupils use similar spreadsheets to manipulate coefficients and constants of functions to generate graphs of different functions. They also learn how the coefficients and constant affect the properties of graphs.

Secondary 1 [S1 Functions and Graphs (I) Cartesian Coordinates]	<ul style="list-style-type: none"> - Pupils learn to read positions of points on a Cartesian plane using ordered pairs with the simulations generated by a spreadsheet. - Building on this, pupils enter ordered pairs into a simulation where they observe the changes and learn how a linear graph is plotted before they proceed to sketch graphs on paper. - Pupils move on to learn the properties of a linear graph.
Secondary 2 [S2 Functions and Graphs (II) Quadratic Functions]	<ul style="list-style-type: none"> - Building on their prior knowledge of linear graphs, pupils use the spreadsheet to learn the properties of graphs of quadratic functions by changing the values of the coefficient of x^2 in a spreadsheet.
Secondary 3 / 4 [S3 Functions and Graphs (I) Cubic Functions]	<ul style="list-style-type: none"> - Building on their prior knowledge, they learn the properties and sketch the graphs other polynomial functions (e.g. $y = x^2$) with the help of spreadsheets.

Application of ICT



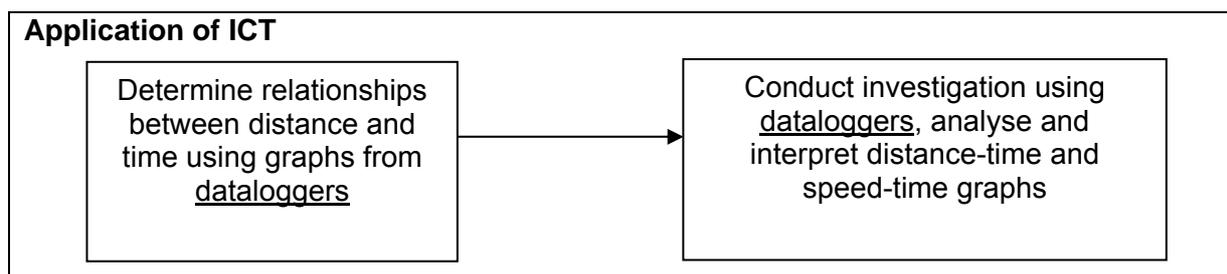
Planning for ICT Integration Across Levels

Example 4: Science (Secondary)

The concepts of speed and velocity in the unit of Kinematics are taught over 2 years. It begins with the investigation to verify the relationship between distance and time in the calculation of average speed of objects in motion in Secondary One and progresses to understand the concept of velocity in Secondary Three.

Below shows how the integration of ICT supports and enhances the learning outcomes across the level within a unit. To build on pupils' familiarity of the concept and skills needed for the tasks, pupils use the same ICT tool to manipulate and capture data to demonstrate the relationship among the variables.

Secondary 1 [S1 Speed and Average Speed]	- Based on the graphs generated by dataloggers, pupils determine the relationship between distance and time to calculate the average speed of a moving object.
Secondary 3 [S3 Distance, Time, Speed Graphs]	- To build on their prior knowledge on the formula of speed, pupils investigate the relationships among distance, time and velocity using dataloggers. They then plot, analyse and interpret the distance-time and speed-time graphs.



Lesson Design Checklist

The following is a sample checklist intended to guide teachers in designing a lesson plan which integrates ICT for engaged learning:

Learning Outcomes

- Learning outcomes are stated in measurable terms
- Learning outcomes are achievable within lesson duration
- Pre-requisite knowledge/skills are considered (if applicable)

Lesson Tasks

- Pupils' prior knowledge is activated before new information is presented / new activities are carried out
- Lesson tasks support the achievement of learning outcomes
- Lesson tasks incorporate thinking skills, namely (at least 1):

Comparing	<input type="checkbox"/>
Classification	<input type="checkbox"/>
Induction	<input type="checkbox"/>
Deduction	<input type="checkbox"/>
Decision Making	<input type="checkbox"/>
Problem Solving	<input type="checkbox"/>
Analysing Perspectives	<input type="checkbox"/>
Others: _____	<input type="checkbox"/>

- Pupils are engaged through (at least 1)
 - Use of appropriate pedagogies that suit their learning styles and readiness
 - Tasks that stretch their thinking
 - Interdisciplinary tasks
 - Authentic tasks
 - Feedback to improve their learning
- Teachers' roles in instruction, guidance and facilitation are clear
- Assessment is linked to and measures the achievement of learning outcomes
- Lesson closure
 - Summarises what was learnt in the lesson
 - Sets the stage for next step in learning (if applicable)

Use of ICT

- The use of ICT is appropriate and supports learning outcomes
- Pupils are given the opportunity to interact and apply ICT skills
- The use of ICT is ethical, legal, safe and responsible (if applicable)

Lesson Materials

- Lesson materials are suitable within pupils' general level of ability

Lesson Ideas for ICT Integration

Learning of Languages

- *Annotate/Highlight text in innovative ways*
 - Pupils highlight the letters representing the target sound (e.g. the /u:/ sound) as they listen to a recording.
 - For a writing task, pupils peer edit by inserting comments into their classmate's work (according to evaluation rubrics). After a few cycles of editing, the writer writes the final draft.

- *Sort and process data quickly and efficiently*
 - Pupils search for information on their assigned forest creature and classify the information into a database (to form fact cards). The database will be re-used in the Science lesson on the web of life.

- *Retain evidence of the editing process so that it can be examined*
 - Pupils record a given passage. Teacher gives feedback and pupils re-record.
 - Pupils write their own script (e.g. narration of folktale) and record it. Peers listen to their recording and carry out peer evaluation according to rubrics.

- *Compose multi-authored texts*
 - In a discussion forum, pupils take turns to write a narrative text, building on what the previous group member has contributed (Round Robin)

- *Write to a wider range of audience*
 - Pupils write an invitation email (e.g. to a party) to their classmates. Classmates reply by accepting or rejecting their invitation (simulation).
 - Pupils send an email interview to their teachers (according to their subject specialisation) to find out more about a job they are interested in. They create an information brochure based on their teacher's information.
 - Pupils read a controversial article (e.g. on cloning) and post their opinions on their blog, inviting comments from readers from all over the world.

- *Exercise choice of medium while composing*
 - After reading a few folktales, pupils choose one to retell in the form of a comic strip (using the free Comic Creator).

Lesson Ideas for ICT Integration

Learning of Mathematics¹¹

- *Experiment and learn from feedback*
 - Pupils draw out relationships from examples/patterns generated using digital resources, such as simulations. They then use the same digital resource to generate more examples and get feedback to re-affirm their observation.
 - From representations/patterns generated by digital resources (e.g. simulations), pupils can also learn to interpret information presented in different forms.

- *Think logically and develop problem-solving skills*
 - Pupils use structures, such as tables in spreadsheets, to guide them in creating the relevant data for observation and analysis when solving problems.

- *Observe, explore and explain patterns in number, shape and data*
 - Pupils explore and describe ways to organise a group of objects using a graphic organiser.

- *Make generalisations that can be based on experimental evidence*
 - Pupils manipulate with variables in a simulation (e.g. an applet), and observe the changes. They are then guided through questions to make sense out of patterns to arrive at general forms or relationships.

- *Make and test hypotheses and predictions, which can be based on large amounts of data*
 - Using a simulation, pupils test out a formula with various possibilities.

- *Develop mathematical vocabulary and language*
 - Pupils apply their prior knowledge to create their own problem sums using a spreadsheet and explain them in their own words.

¹¹ Adapted from <http://www.ncaction.org.uk/subjects/maths/ict-Irn.htm>

Lesson Ideas for ICT Integration

Learning of Science

- *Access updated news or information using sources like the Internet and multimedia software*
 - Pupils access information from prescribed URLs to complete a given worksheet
 - Pupils conduct an Internet search to compare different perspectives on a given topic, before making their own conclusions

- *Measure and analyse variables in experiments and investigations*
 - Pupils follow step-by-step instructions to measure physical quantities using dataloggers
 - Pupils design their own experiments using appropriate data probes to conduct investigations

- *Investigate and evaluate using software that animates, simulates or models a concept*
 - Teacher uses animations to enhance pupils' understanding of a concept
 - Pupils manipulate the variables in a simulation to investigate the workings of a system

- *Create, analyse, evaluate and graph a range of data; in search for patterns*
 - Pupils use graphing tools to analyse results of an experiment or to identify patterns from data collected

- *Plan, select, present and evaluate work using multimedia elements*
 - Pupils use graphic organizers to consolidate learning points
 - Pupils present results of their findings/experiments using appropriate multimedia elements

Lesson Ideas for ICT Integration

Learning of Humanities

- *Access updated news or information using sources like the Internet and multimedia software*
 - Pupils access information from prescribed URLs to complete a given worksheet
 - Pupils conduct an Internet search to compare different perspectives on a given topic before making their own conclusions
- *Measure and analyse variables in experiments and investigations*
 - Pupils follow step-by-step instructions to measure physical quantities using dataloggers
 - Pupils design their own experiments using appropriate data probes to conduct investigations
- *Investigate and evaluate using software that animates, simulates or models a concept*
 - Teacher uses animations to enhance pupils' understanding of a concept
 - Pupils manipulate the variables in a simulation to investigate the workings of a system
- *Create, analyse, evaluate and graph a range of data; in search for patterns*
 - Pupils use graphing tools to analyse results of an investigation or to identify patterns from data collected
- *Plan, select, present and evaluate work using multimedia elements*
 - Pupils use graphic organizers to consolidate learning points
 - Pupils present results of their findings/experiments using appropriate multimedia elements
- *Think logically and develop problem-solving skills*
 - Pupils use structures, such as concept maps, to guide them in creating the relevant data for observation and analysis when making enquiry.
- *Write to a wider range of audience*
 - Pupils read a controversial article (e.g. on Japan's role in World War II) and post their opinions on their blog, inviting comments from readers from other classes.

Lesson Plan (Primary)

Subject:	Mathematics
Level:	Primary 3
Topic:	Bar Graphs
Learning Outcome(s):	Read and interpret bar graphs
Description:	Pupils generate numerous examples of picture graphs and corresponding bar graphs with an activity created using spreadsheet to see the relationship between the 2 types of graphical representations. From their observations, they learn to read and interpret bar graphs.
Background Knowledge:	Pupils are able to read and interpret picture graph
Pre-lesson Activity:	Nil
Duration:	60 min
ICT Skills:	- PS1 – Create, edit and format tables of data - PT1 – Type short sentences or paragraphs

Activities		Duration	Resources
1.	Teacher revises the concept of reading and interpreting picture graph with the class.	5 min	
2.	Pupils work in pair to infer the relationship between picture graph and bar graph. Pupils are to generate at least 5 different graphs and answer Q 1. Through the graphs generated, pupils are to compare and draw out similarities between objects in the pictogram and the height of the bar generated. Pupils are to discuss any observations and try to answer Q2.	20 min	<u>Worksheet</u> Worksheet – P3 Bar Graph.xls (Activity 1)
3.	Teacher discusses with pupils the findings and introduces bar graph & vertical scale to them. Pupils read the height of each bar with reference to the vertical scale. Teacher can ask pupils questions based on the bar graph in Activity 1, e.g. – “Who has more watermelon? John or Mary?” – “Who has the fewest watermelon?” – “How many watermelon does Peter has?” – “Compare the number of watermelons that John and Peter have. Who has more? How many more?” – “How many watermelons did all have altogether?”	15 min	<u>Worksheet</u> Worksheet – P3 Bar Graph.xls (Activity 1)
4.	Pupils reinforce their learning on reading and interpreting Bar Graph. – Teacher work through “Activity 2” once with pupils as an example. – Pupils generate their own data and work through the activity.	15 min	<u>Worksheet</u> Worksheet – P3 Bar Graph.xls (Activity 2)
5.	The teacher summarises the lesson.	5 min	

Lesson Plan (Primary)

Worksheets

Activity 1

Generate new data

1a) Based on Graph 1, what is the number of water melon Jane has?

Check

1b) Based on Graph 2, what is the reading for Jane on the vertical line?

Check

1c) Is the value for question 1 & 2 the same?

2) What can you say about the number of water melon and the vertical column of graph 2?

Name	Watermelon Slices
John	3
Peter	1
Marg	8
Jane	3

Name	Number of Watermelons
John	4
Peter	1
Marg	8
Jane	3

Activity 2

Generate new data

Number of Animals in Night Safari

Types of Animals	Number of Animals
Dog	28
Cat	25
Pig	7
Chicken	22
Snake	18
Horse	11
Rabbit	29
Cow	17
Deer	26
Mouse	25
Bird	10
Fish	29
Monkey	6
Bear	19
Tiger	23
Lion	11
Elephant	6
Giraffe	16
Zebra	11
Fox	10

Name the animal that has the least. (Name one if there is more than one).

Check

How many types of animals have more than 20 in numbers?

Check

How many types of animals have less than 10 in numbers?

Check

Lesson Plan (Secondary)

Subject:	English
Level:	Secondary 2
Topic:	Narratives (III)
Learning Outcome(s):	<ul style="list-style-type: none"> - Understand sequence of events - Recognise plot structure, including conflict
Description:	Pupils learn the structure of narratives by filling in a graphic organiser as they read an interactive online storybook with their teacher. They then internalise the structure by working in pairs to plan an original story using the word processor.
Pre-lesson Activity:	Nil
Duration:	60 min
ICT Skills:	<ul style="list-style-type: none"> - SK1 – Operate in an interactive media environment - ST1 – Create pages of text - ST2 – Edit and format pages of text

Activities		Duration	Resources
1.	<p><u>Guiding Discovery</u> Read with pupils an interactive storybook (with any of the given URL) and introduce the features of narratives (orientation, complication, development and resolution) to them by guiding them to fill in the graphic organiser.</p> <p><i>Note:</i> You could evaluate the interactive storybook with the class to discuss what makes it interesting.</p>	40 min	<p><u>Websites</u> http://www.magickeys.com/books/happen/index.html</p> <p>http://www.outpost221.com/pugwash/pugwash.htm</p> <p>http://www.netrover.com/~kingskid/eat0.html</p> <p><u>Worksheet</u> Worksheet 1 – S2 Narratives (III).doc</p>
2.	<p><u>Enabling Application</u> Pupils then work in pairs to plan a story by choosing the characters, setting and plot. In their plan, they are to create on the word processor an original story about someone who had lost something but later found it again.</p> <p><i>Note:</i> Pupils could then use the word processor to write their stories individually as a follow-up.</p>	20 min	<p><u>Worksheet</u> Worksheet 2 – S2 Narratives (III).doc</p>

Co-Authored by Ngee Ann Secondary School and ETD

Lesson Plan (Secondary)

Worksheet 1

Name: _____ Class: _____ Date: _____

Narrative Structure

As you read the online story with your teacher, fill in the table below.

Title: _____

by _____ & _____

Characters:	Descriptions:
Setting:	
Plot: Orientation: Development: Complications: Resolution:	

Lesson Plan (Secondary)

Worksheet 2

Name: _____ Class: _____ Date: _____

Planning a Narrative

Task: Create an original story about someone who had lost something but later found it again.

Title: _____

by _____ & _____

Characters:	Descriptions:
Setting:	
Plot: Orientation: Development: Complications: Resolution:	

Planning for ICT Integration

The following is a sample form to be submitted to the HOD ICT by HOD IP for compilation of the School Monitoring Matrix (Annex E-1):

Information Category	HOD/Program/Project Coordinator Input
Subject/Program/Project (e.g. English, Music, e-learning Week)	Mathematics
Level (e.g. Sec 1)	Sec 1 Express
Baseline ICT Skills Targeted (Tick as appropriate)	<input type="checkbox"/> SK1 Operate in an interactive media environment <input checked="" type="checkbox"/> SH1 Use search engines and keywords independently <input type="checkbox"/> SS1 Create, edit and format graphs and charts <input type="checkbox"/> SS2 Use built-in functions to process data <input checked="" type="checkbox"/> ST1 Create pages of text <input checked="" type="checkbox"/> ST2 Edit and format pages of text <input type="checkbox"/> SM1 Produce multimedia elements <input type="checkbox"/> SM2 Create presentation with hyperlinks <input type="checkbox"/> SC1 Communicate online <input type="checkbox"/> SD1 Export data collected
Period of Implementation (e.g. Term 2 Week 5)	Term 2 Week 8 to Term 3 Week 3
Learning Outcome(s) (e.g. Reasons for race riots in Singapore)	To build a model of the Maths Garden with PowerPoint presentation
Short Activity Description (e.g. teachers man the forums from 8-1pm during the Learning Festival and respond to pupils inputs. Pupils also comment on each other's input. They are allowed to edit but not delete their contributions)	Pupils are supposed to build a model of Maths garden. They are supposed to check the internet to get costs of tiles, etc for building the garden in real time. They are then to build the model and present it in PowerPoint presentation. Uploading is also done via e-learn.
ICT used (e.g. Forums, MS Word)	PowerPoint, School Portal, Internet

(Adapted from Bedok View Secondary School)

Professional Development Guide for Teachers (Version 4)

Introduction

This Professional Development (PD) Guide is a tool for teachers to profile their ICT competencies, identify their learning needs and plan for their own professional development. It is based on the revised Learning Framework for Education Officers managed by Training and Development Division. The learning dimensions addressed in the PD Guide for teachers are on Professional Practice and Personal Effectiveness. The areas under these dimensions are listed in the table below:

Developmental Role	Learning Dimension	Area
Teacher	Professional Practice	Cultivating Knowledge - Pedagogical Knowledge & Skills - Use of ICT resources - Lesson Design - Assessment & Evaluation - Classroom Management
	Personal Effectiveness	Cyberwellness

Professional Development Guide for Teachers (Version 4)

Use of PD Guide

Apart from helping teachers self-assess and profile their ICT competencies and plan their own professional development, they can use this in tandem with the Enhanced Performance Management System (EPMS) when planning for their training and development with their Reporting Officer (RO).

How to Use

There are 2 sections in the guide, namely:

1. Section A - Self-profiling & PD Planning

This section is to be completed by the teacher. For each of the 4 areas, the teacher identifies his/her current level with a tick in the check box next to the descriptor that most closely matches his/her level of skill/knowledge. The levels are incremental in nature i.e. being at Level 3 includes the abilities indicated for Levels 1 & 2.

2. Section B - PD Planning with RO

This section is for use at meetings between the teacher and RO when reviewing work and PD needs.

- a. The teacher completes the first 3 columns before meeting RO. This section can be used in tandem with the Training & Development Plan (Section 3) of the Work Review Form.
- b. The teacher may look for available courses from training directories and prospectuses e.g. from TRAISI, edu.MALL or the Institute of Policy and Management (IPAM) directory.
- c. The last column is provided for Pre/Post-Course Review (PPCR).

Professional Development Guide for Teachers (Version 4)

Teacher's name: _____ Teaching experience: ____yrs Subject(s) taught/Level: _____

Section A: Self-profiling & PD planning

Professional Practice: Pedagogical Knowledge & Skills

(a) Use of ICT resources

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> Teacher searches & evaluates ICT resources to support curricular goals	<input type="checkbox"/> Teacher uses appropriate ICT resources to support curricular goals	<input type="checkbox"/> Teacher uses ICT resources that develop pupils' higher order thinking skills (namely analysis, synthesis & evaluation)	<input type="checkbox"/> Teacher adapts/creates ICT resources that develop pupils' higher order thinking skills (namely analysis, synthesis & evaluation)

(b) Lesson Design

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> Teacher adopts given ICT lesson plans	<input type="checkbox"/> Teacher adapts and designs ICT lesson plans that support curricular goals	<input type="checkbox"/> Teacher designs ICT lessons that develop pupils' higher order thinking skills (analysis, synthesis & evaluation)	<input type="checkbox"/> Teacher experiments with and leverages on emerging technologies for use in teaching and learning

Professional Practice: Assessment & Evaluation

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> Teacher adopts and adapts activities that assess pupils' learning using ICT, providing immediate and constructive feedback	<input type="checkbox"/> Teacher adopts and adapts activities that use ICT for self- and peer-assessment (e.g. to critique pupil-created products)	<input type="checkbox"/> Teacher designs activities that use ICT for self- and peer-assessment <input type="checkbox"/> Teacher uses products of pupils' learning to review and improve on the Schemes of Work and practices	<input type="checkbox"/> Teacher experiments with the use of ICT in assessment & evaluation <input type="checkbox"/> Teacher uses ICT to diagnose the pupils' learning to review and improve on the Scheme of Work and practices

Professional Development Guide for Teachers (Version 4)

Professional Practice: Classroom Management

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> Teacher manages ICT-based learning activities in a computer lab/classroom : <ul style="list-style-type: none"> - Establishes routines in the use, care and sharing of ICT resources - Sets up support systems for pupils (e.g. ICT monitor, group work) 	<input type="checkbox"/> Teacher manages ICT-based learning activities outside the computer lab/classroom (e.g. data collection in the school garden, fieldwork)	<input type="checkbox"/> Teacher manages ICT-based learning activities in an asynchronous virtual environment (e.g. online discussion forum, blogs)	<input type="checkbox"/> Teacher manages ICT-based learning activities in a synchronous virtual environment (e.g. multi-user domains ¹²)

Personal Effectiveness: Cyberwellness

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> Teacher identifies ethical and legal as well as safe and responsible use of ICT in education (namely privacy, copyright, file-sharing, plagiarism)	<input type="checkbox"/> Teacher models and teaches ethical and legal as well as safe and responsible use of ICT in education based on a set of guidelines developed by the school <input type="checkbox"/> Teacher implements Acceptable Use Policies in the classroom	<input type="checkbox"/> Teacher arranges for equitable access to ICT resources <input type="checkbox"/> Teacher implements policies in the classroom that ensure ethical, legal, safe and responsible Internet publishing	<input type="checkbox"/> Teacher consciously plans for application of cyberwellness knowledge in lesson assignments that require pupils to observe safe and responsible use of ICT

¹² E.g. Second Life, Quest Atlantis

Professional Development Guide for Teachers (Version 4)

Section B: Training & Development Plan¹³ to acquire ICT skills/knowledge

Target Level /Skill	Suggested PD activity (e.g. workshop, readings, mentorship)	Timeframe	Learning Outcome(s)	Pre/Post-Course Review (PPCR)
e.g. Use of ICT resources Level 2 - Teacher uses appropriate ICT resources to support curricular goals	Workshop: Learning with Data Collection Tools	1 Day 7 Jun 08	1. Explore use of various data collection tools 2. To develop effective lessons by Integrating use of data collection tools in the teaching of Science	

Other Notes:

Discussed with RO at Work Review Meeting on _____

¹³ In conjunction with EPMS Work Review Section 3: Training & Development Plan

Professional Development Guide for HODs (Version 4)

Introduction

This Professional Development (PD) Guide is a tool for HODs to profile their ICT competencies, identify their learning needs and plan for their own professional development. It is based on the revised Learning Framework for Education Officers managed by Training and Development Division. The learning dimensions addressed in the PD Guide for HODs are on Visioning for the Future, Managing People and Personal Effectiveness. The areas under these dimensions are listed in the table below:

Developmental Role	Learning Dimension	Area
HOD	Visioning for the Future Managing People	<ul style="list-style-type: none"> - Instructional Leadership - Strategic Planning - People Development
	Personal Effectiveness	Cyberwellness

Professional Development Guide for HODs (Version 4)

Use of PD Guide

Apart from helping HODs self-assess and profile their ICT competencies and plan for their own professional development, Reporting Officers (ROs) of the HODs can also use this in tandem with the Enhanced Performance Management System (EPMS) when planning for their training and development.

How to Use

There are 2 sections in the guide, namely:

1. Section A - Self-profiling & PD Planning

This section is to be completed by the HOD. For each of the 4 areas, the HOD identifies his/her current level with a tick in the check box next to the descriptor that most closely matches his/her level of skill/knowledge. The levels are incremental in nature i.e. being at Level 3 includes the abilities indicated for Levels 1 & 2.

2. Section B - PD Planning with RO

This section is for use at meetings between the HOD and RO when reviewing work and PD needs.

- a. HOD completes the first 3 columns before meeting RO to review PD needs. This section can be used in tandem with the Training & Development Plan (Section 3) of the Work Review Form.
- b. HOD may look for available courses from training directories and prospectuses e.g. from TRAISI, edu.MALL or the Institute of Policy and Management (IPAM) directory.
- c. The last column is provided for Pre/Post-Course Review (PPCR).

Professional Development Guide for HODs (Version 4)

HOD's name: _____ Department: _____ No. of years as HOD: ____yrs

Section A: Self-profiling & PD planning

Leadership & Management: Instructional Leadership (HOD IP)

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> HOD sources and recommends ICT resources that can support curricular goals <input type="checkbox"/> HOD integrates the use of ICT into Schemes of Work	<input type="checkbox"/> HOD develops and implements an ICT-integrated department work plan that: <ul style="list-style-type: none"> - includes strategies for ICT integration into curriculum, professional development - is aligned to school's goals <input type="checkbox"/> HOD reviews the implementation of the ICT-integrated department work plan using self-evaluation tools (e.g. BY(i)TES)	<input type="checkbox"/> HOD develops and implements an ICT-integrated department work plan that raises the level of ICT integration in the department	<input type="checkbox"/> HOD contributes to an innovative shared vision for the use of ICT in the department

Professional Development Guide for HODs (Version 4)

Leadership & Management: Strategic Planning (HOD ICT)

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> HOD incorporates different department work plans into a single school ICT plan	<input type="checkbox"/> HOD develops synergy between different department ICT work plans into a coherent school ICT plan that: <ul style="list-style-type: none"> - includes strategies for pupils' training & ICT infrastructure - is aligned to school's goals <input type="checkbox"/> HOD reviews the implementation of the school ICT plan using self-evaluation tools (e.g. BY(i)TES) or other strategies	<input type="checkbox"/> HOD develops, implements and evaluates the school ICT plan that raises the level of ICT integration in the school	<input type="checkbox"/> HOD contributes to an innovative shared vision for the use of ICT in the school

Professional Development Guide for HODs (Version 4)

Leadership & Management: People Development

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> HOD guides and provides feedback and suggestions to teachers as they <ul style="list-style-type: none"> - Design ICT lessons - Use ICT for assessment - Manage ICT-enabled learning environment <input type="checkbox"/> HOD conducts regular learning needs analysis for teachers (in the domain of ICT in teaching and learning) <input type="checkbox"/> HOD plans and organises professional development programmes for teachers based on their needs	<input type="checkbox"/> HOD demonstrates the use of ICT in <ul style="list-style-type: none"> - Developing pupils' higher order thinking skills - Assessment (e.g. immediate feedback, peer assessment) - A variety of ICT-enabled learning environment (e.g. computer laboratories, online forums, fieldwork) <input type="checkbox"/> HOD plans and organises a wide range of professional development programmes (e.g. reading, coaching) for teachers based on their needs <input type="checkbox"/> HOD provides opportunities for teachers to share and collaborate	<input type="checkbox"/> HOD provides regular opportunities for <ul style="list-style-type: none"> - Group reflection - Development of ICT lessons 	<input type="checkbox"/> HOD provides opportunities for teachers to <ul style="list-style-type: none"> - Participate in case studies, surveys and experimental research - Experiment with the use of ICT in teaching and learning

Professional Development Guide for HODs (Version 4)

Personal Effectiveness: Cyberwellness

Level 1	Level 2	Level 3	Level 4
<input type="checkbox"/> HOD identifies and highlights ethical, legal, safe and responsible use of ICT in education (namely privacy, copyright, file-sharing, plagiarism) & communicates them to teachers	<input type="checkbox"/> HOD establishes department-wide Acceptable Use Policies <input type="checkbox"/> HOD incorporates cyberwellness framework to develop a set of guidelines for ethical, legal, safe and responsible use of ICT for the school	<input type="checkbox"/> HOD arranges for department-wide equitable access to ICT resources <input type="checkbox"/> HOD implements department-wide policies that ensure ethical, legal, safe and responsible Internet publishing	<input type="checkbox"/> HOD plans an integrated approach in introducing ethical, legal, safe and responsible use of ICT across levels &/or subjects

Professional Development Guide for HODs (Version 4)

Section B: Training & Development Plan¹⁴ to acquire ICT skills/knowledge

Target Level /Skill	Suggested PD activity (e.g. workshop, readings, mentorship)	Timeframe	Learning Outcome(s)	Pre/Post-Course Review (PPCR)
<i>e.g. Strategic Planning Level 2 – Reviewing an ICT-integrated department work plan</i>	<i>Use of BY(i)TES as self-evaluation tool</i>	<i>Sept 08</i>	<i>Use BY(i)TES to evaluate the degree of ICT integration in Sec 1 curriculum for 2008</i>	

Other Notes:

Discussed with RO at Work Review Meeting on _____.

¹⁴ In conjunction with EPMS Work Review Section 3: Training & Development Plan

ICT Learning Needs Analysis for Teachers

The following is a sample ICT learning needs analysis for teachers:

XX School
ICT Learning Needs Analysis for Teachers

This short questionnaire has been designed to determine the learning needs of XX school in the use of ICT. Please answer the questions below. Your response is important for the school to provide appropriate training to meet your needs. Please return the questionnaire to the General Office by _____ (date).

Thank you very much for your time.

Name: _____ Department: _____

Section 1 – Use of ICT

1. How often do you use a computer? (Please tick one)

Never Occasionally Daily

2. If you use ICT equipment, what are your most common activities, other than email and web browsing? (Please rank a maximum of three with '1' being the most common activity)

	Rank
Word Processing	
Producing Spreadsheets	
Producing Presentation	
Desktop Publishing	
Website Development	
Manipulating of Digital Camera/ Video Camera	
Others (Please specify): _____	

ICT Learning Needs Analysis for Teachers

Section 2 – ICT Learning Needs

3. The table below shows a list of ICT skills. Please indicate your competency in the appropriate column.

	Know	Don't Know
General Computer Use		
Create a new folder		
Rename a file/folder		
Copy a file/folder		
Print a file or document		

Word Processing

Format text		
Use paragraph formatting		
Use spell check		
Create and Insert tables		
Create bulleted or numbered lists		
Insert page numbers		
Insert graphics		

Spreadsheets

Enter data		
Sort data		
Create charts		
Format cells		

Presentation

Create a presentation		
Insert text and graphics		
Insert slide transitions and animations		

Manipulation of Digital Camera/Video Camera

Take photos		
Take videos		

Internet

Create and send email		
Send an attachment with an email		
Use search engines		

Website Development

Create a webpage from scratch		
Insert links		
Upload pages to the web server		

ICT Learning Needs Analysis for Teachers

4. Which of the following would you like to learn? (Please tick maximum of 3)

Advanced word processing skills

Advanced presentation skills

Advanced spreadsheet skills

Webpage Creation

Illustration software (e.g. CorelDraw)

Image Manipulation software (e.g. Photoshop)

Others (please specify):

5. Do you think there are any obstacles to your development of ICT competency? If so, please select a maximum of three from the following list:

Lack of time

Current courses are not relevant to my work

I am not aware of courses currently offered

Lack of suitable computer equipment

Lack of support from school/supervisor

Others (please specify):

6. Please give details of any other ICT training that would help you to do your job.

Thank You!

(Adapted from First Toa Payoh Primary School)

ICT Training Guide for Pupils (Version 4)

The following is a sample which details the Baseline ICT Skills pupils will learn in a formal training programme:

Skills Area	Components of ICT Skills	
	Primary 1 – 3	Secondary 1 – 2
Basic Operations (K)	Navigate in a Graphical User Interface (GUI) <ul style="list-style-type: none"> - Logging into the computer - Activate icons on computer desktop - Activate icons of application software - Activate icons of digital resources - Move around within an application and digital resource - Proper shutdown of computer Use application software and work with files <ul style="list-style-type: none"> - Start and close application software - Open, save, print and close files (e.g. documents and presentations) 	Operate in an interactive media environment <ul style="list-style-type: none"> - Start the interactive media environment (e.g. applets, Geometer's Sketchpad, simulations) - Drag and move an object - Manipulate data - Close the interactive media environment

Skills Area	Components of ICT Skills		
	Primary 1 – 3	Primary 4 – 6	Secondary 1 – 2
Learning With Searches (H) <i>Internet navigation and search</i>	Use digital resources from specified sources <ul style="list-style-type: none"> - Open browser - Activate hyperlinks - Save a web page - Print a web page 	Use search engines and keywords <ul style="list-style-type: none"> - Enter a web address - Return to previously viewed pages - Search the World Wide Web Store - Store favourite web address - Use different search engines - Use history bar - Play media (e.g. sound, video) over the web - Download files 	Use search engines and keywords independently <ul style="list-style-type: none"> - Use Boolean searches - Search using subject directories - Search for specific resources (e.g. images, music files)

ICT Training Guide for Pupils (Version 4)

Skills Area	Components of ICT Skills		
	Primary 1 – 3	Primary 4 – 6	Secondary 1 – 2
Learning With Text (T) <i>Word processing</i>	Type short sentences or paragraphs <ul style="list-style-type: none"> - Start a word processor - Exit a word processor - Create a new document - Open an existing document - Save a document - Preview a document - Print a document - Print a specific page - Printing multiple copies of a document - Create a new folder - Create a text box - Be familiar with keyboard - Type with proper positioning of fingers - Progress from typing letters to words, phrases, and then short sentences and paragraphs - Input numbers - Insert punctuation marks - Change upper and lower case letters Edit and format short sentences <ul style="list-style-type: none"> - Remove letters using backspace and delete keys - Drag and select words, phrases or sentences - Change font - Change colour of text - Change style of text: bold, underline, italics - Change size of text - Remove characters - Delete selected text - Replace selected text - Cut/copy and paste text - Use drag-and-drop editing - Use undo and redo features - Use spelling checker features 	Type paragraphs of text <ul style="list-style-type: none"> - Type with proper positioning of fingers Edit and format paragraphs of text <ul style="list-style-type: none"> - Organise text - Insert symbols - Insert special characters - Highlight text with colours - Add numbering or bullets - Delete numbering or bullets - Change numbering or bullets style Create tables and edit content <ul style="list-style-type: none"> - Create a table - Navigate a table - Enter text or numbers - Edit text or numbers - Insert blank lines - Hide/Show gridlines - Insert rows or columns - Delete rows or columns 	Create pages of text <ul style="list-style-type: none"> - Insert auto shapes - Insert pictures - Insert tables Edit and format pages of text <ul style="list-style-type: none"> - Change alignment - Create Headers and Footers - Insert the Current Page Number - Insert the Current Date - Create a First Page Header/Footer - Alternate Odd and Even Headers/Footers - Set the Starting Page Number - Insert a Manual Page Break - Remove a Manual Page Break - Change the Page Orientation - Change the Document Margins - Change the Paper Size

ICT Training Guide for Pupils (Version 4)

Skills Area	Components of ICT Skills		
	Primary 1 – 3	Primary 4 – 6	Secondary 1 – 2
Learning With Multimedia (M) <i>Production and manipulation of multimedia content</i>	Combine text with drawings or pictures in a presentation <ul style="list-style-type: none"> - Start a presentation - Exit a presentation - Create a new presentation - Enter text into a presentation - Save a presentation - Preview a presentation - Print a presentation - Draw an enclosed object - Change fill colour of an object - Apply a fill effect - Draw a line - Format lines - Move a graphic - Resize a graphic - Cut/Delete a graphic - Copy/Paste a graphic - Add a new slide - Insert/duplicate slide - Add and remove numbering/bullets - Use the clip art features - Insert a graphic from a file 	Create a multimedia presentation <ul style="list-style-type: none"> - Insert video files - Insert sound files 	Produce multimedia elements <ul style="list-style-type: none"> - Crop image - Shorten or combine sound or video files using simple application software (e.g. MS PowerPoint, Windows Sound Recorder, iMovie, Windows Movie Maker) Create presentation with hyperlinks <ul style="list-style-type: none"> - Create hyperlink to websites, online hosted files (e.g. videos, music, documents) - Insert buttons, images or text as navigational aids

Skills Area	Components of ICT Skills	
	Primary 4 – 6	Secondary 1 – 2
Learning With Spreadsheet (S) <i>Data management and processing</i>	Create, edit and format tables of data <ul style="list-style-type: none"> - Open a spreadsheet - Exit a spreadsheet - Create a new spreadsheet - Save a spreadsheet - Preview a spreadsheet - Print a spreadsheet - Print a specific page of a spreadsheet - Print multiple copies of a spreadsheet - Enter text and numbers into cells - Enter numbers into cells - Edit cell entries - Format data according to data types: currency, date and decimal - Select columns and rows - Change the width of columns - Change the height of rows - Adjust columns automatically - Hide columns and rows - Unhide columns and rows - Insert a column - Insert a row - Delete a column 	Create, edit and format graphs or charts <ul style="list-style-type: none"> - Creating bar graphs with the chart wizard - Move and resizing charts - Identify chart objects - Change the chart type and sub-type - Change the plot direction - Add chart titles - Remove/Add a legend - Reposition the legend - Change the chart range - Change the data source - Print a chart - Create bar graphs, pie charts & line graphs with chart wizard - Format chart objects Use built-in functions to process data <ul style="list-style-type: none"> - Use automatic calculation features (Σ) - Insert mathematical functions in formulas

ICT Training Guide for Pupils (Version 4)

Skills Area	Components of ICT Skills	
	Primary 4 – 6	Secondary 1 – 2
	<ul style="list-style-type: none"> - Delete a row - Use the Merge and Centre Button - Use the Borders Button - Draw Cell Borders - Use the Fill Colour Button <p>Use mathematical formula</p> <ul style="list-style-type: none"> - Enter formulas with basic operations (+ - * /) 	<ul style="list-style-type: none"> - Edit mathematical functions - Sort text in alphabetical order - Sort numbers in ascending or descending order - Use functions for finding average, maximum and minimum values

Skills Area	Components of ICT Skills	
	Primary 4 – 6	Secondary 1 – 2
Learning With Communication Tools (C) <i>Online communication</i>	<p>Send a message</p> <ul style="list-style-type: none"> - Open web mail and Log in - Access message - Send a message - Reply to a message - Delete a message - Send a comment using blogs <p>Send an attachment</p> <ul style="list-style-type: none"> - Compose a message with file attachments - Download file attachments 	<p>Communicate online</p> <ul style="list-style-type: none"> - Open an online communication application software (e.g. chat, forums, wikis, blogs, facebook) - Access and reply to messages

Skills Area	Components of ICT Skills	
	Primary 4 – 6	Secondary 1 – 2
Learning With Data Collection Tools (D) <i>Data collection and transfer</i>	<p>Record pictures, sound, video or data using ICT tools</p> <ul style="list-style-type: none"> - Take pictures - Start/Stop recording of sound or video - Scan text or pictures - Use of dataloggers to <ul style="list-style-type: none"> o Start/Stop recording o Clear datalogger memory o Read off measurements from display panel o Start/Stop recording via an attached computer o Insert/Remove sensor o Change sampling rate/time of recording o Download measurement readings to a computer o View measurement readings taken 	<p>Export data collected</p> <ul style="list-style-type: none"> - Transfer data or media from a device (e.g. datalogger, scanner, digital camera, mp3 recorder) to a computer - Move data or media into an application (e.g. spreadsheet, photo editor blog, photo gallery)

ICT Equipment Loan Forms

The following are samples of ICT Equipment Loan Forms:

XX SCHOOL

Permanent Loan of Digital Video No. 1

Brand: Panasonic NV-180

SERIAL NO: D6HA00762R

Equipment Label: VCAM-02HSS

Accessories: Charger (VSK0651) – Li-ion Battery (CGR-DU06) – Tape Cleaner – USB Cable – AV Cable

Date of Purchased : XX-XX-200X

NO.	NAME OF BORROWER/ DEPT	DATE BORROWED	SIGNATURE OF BORROWER	ISSUED BY	DATE RETURNED	SIGNATURE OF BORROWER	RECEIVED BY	REMARKS
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Rules in the Computer Laboratory

The following is a sample list of rules for the computer laboratory:

Rules in the Computer Laboratory

1. Pupils are to sit according to their register number in the laboratory.
2. When the teacher/trainer claps his/her hands, all pupils are to stop all activities, fold their arms and face the front.
3. During the lesson, ICT monitors will assist the teacher.
4. At the end of the lesson, ICT monitors are to check that the computers are shut down/logged out properly and the laboratory is in order before leaving the room.
5. Teachers have to update on the whiteboard the computers that are not working and the problem faced during their lesson. This is to inform the subsequent users and also facilitate the Technology Assistant's work.

(Adapted from Henry Park Primary)

Pupil ICT Handbook

The following is a sample page from a pupil ICT handbook:

Name : _____

Class : Primary 1 __

Evidence of attainment of ICT Skills:

The pupil is able to produce a written expression assignment after completing the following software/hardware IT courses:

ICT Courses Attended by Pupil			
Intro to Win XP			
Touch Typing			
MS Word			
The above ICT Courses are designed to enable the pupil to...			
SKILLS AREA	CODE	SKILLS	
Basic Operations (K)	PK1	Navigate in a Graphical User Interface (GUI)	
	PK2	Use application software and work with files	
Learning with Text (T)	PT1	Type short sentences or paragraphs	
	PT2	Edit and format short sentences	

Endorsed by: _____
(Form Teacher)

Date: _____

(Adapted from Bedok Green Primary School)

School Monitoring Matrix

The following is an extract of a School Baseline ICT Monitoring Matrix:

Term 1					Baseline ICT Skills									
S/N	Subject	Level	Stream	Description	SK1	SH1	SS1	SS2	ST1	ST2	SM1	SM2	SC1	SD1
1	EL	1	E	Pupils searched for information on climate change and created a podcast.		1					1			
2	EL	1	E	Pupils viewed a story online and answered questions on fantasy characters.		1			1					
3	EL	2	E	Pupils searched for information on mythical creatures and wrote about their fantasy character on their blogs.		1			1					
4	EL	2	E	Pupils researched on a particular food and presented their findings using a PowerPoint template.		1						1		
5	EL	2	E	Pupils read a news report on the STOMP website and formulated questions to create a crossword puzzle using puzzle maker.						1				
English Sec 1E					0	2	0	0	1	0	1	0	0	0
English Sec 2E					0	2	0	0	1	1	0	1	0	0
6	Ma	1	E	Pupils used Excel to create and analyse a graph			1							
7	Ma	1	E	Pupils searched for the definition and properties of quadrilaterals on the Internet.		1								
8	Ma	1	E	Pupils learnt about area and perimeter of geometrical shapes.		1								
9	Ma	2	E	In pairs, pupils came up with questions on algebraic manipulations/equations/factorisations. Every 4 pairs then compiled their questions to form a test paper					1					
10	Ma	2	E	Pupils compared two different schemes of car loan and used Excel to help them decide which scheme was better				1						
Maths Sec 1E					0	2	1	0						
Maths Sec 2E					0	0	0	1	1	0	0	0	0	0
11	Sc	1	E	Pupils searched for examples of mixture and then keyed in their findings in a template.			1		1	1				
12	Sc	2	E	Pupils conducted internet search on some topics related to "colours" so that they could explore beyond textbook knowledge.		1							1	
13	Sc	2	E	Pupils made use of Excel to calculate the total cost of electricity used by different appliances in two different households and translated the raw data into graphical form for analysis.			1				1			
Science Sec 1E					0	0	1	0	1	1	0	0	0	0
Science Sec 2E					0	1	1	0	0	0	1	1	0	0
14	His	2	E	Pupils used the textbook to get an initial grasp of the topic and extended their knowledge by doing an internet search.		1								
15	Geo	2	E	Pupils learnt more about weather and erosion by constructing a graph.			1							
Humanities Sec 1E					0	0	0	0	0	0	0	0	0	0
Humanities Sec 2E					0	1	1	0						
Total Number of Opportunities given to pupils					0	8	4	1	4	2	2	2	0	0

(Adapted from Fuhua Secondary School)

Online Tool for Monitoring Implementation

The following is a screenshot of an Online Tool to Monitor Implementation:

eTrix 2007
STUDENT INTEGRATION MADE SIMPLE

YEW TEE PRIMARY SCHOOL

Home | Office | Calendar | Booking | Students Tracking | Volunteer Work | Weekly Plan | Sys Config

You are here : [Weekly Plan](#) > Add Weekly Plan Tue 11 Sep, 2007 10:03 AM

Year: 2007
Term: 4
Week: 2
Status: -

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
17-Sep-2007	18 Sep 2007	19 Sep 2007	20 Sep 2007	21 Sep 2007

MONDAY 17-Sep-2007

(ITEM 1)

Class: - Select Class - Subject: - Select Subject -

NOTE: Do not select any Class or Subject if you wish to remove a previously created Item*

HOT Skills Relation: Knowledge Comprehension Application Analysis Synthesis Evaluation

ICT Skills Relation: No ICT PK1 PK2 PH1 PT1 PT2 PM1 PH2 PS1
 PS2 PT3 PT4 PT5 PM2 PC1 PC2 PD1 PD2

Arial 1 (8 pt) **B I U** [List Icons] [Text Icon] [Link Icon] [Image Icon] [Info Icon]

(Adapted from Yew Tee Primary School)

Department Monitoring Matrix

The following is sample of a Department Baseline ICT Monitoring Matrix:

Subject : English
 Level : Secondary 1
 Term : 1

Topic Skill Area	Fantasy	Personal Recount	Eye-witness Recount	Short Functional Text
	Week 1-2	Week 3-5	Week 6-8	Week 9-10
Learning with Searches (H)	SH1 Use search engines & keywords independently			
Learning with Spreadsheet (S)				
Learning with Text (T)	ST1 Create pages of text			ST1 Create pages of text
Learning with Multimedia (M)			SM1 Produce multimedia elements	
Learning with Communication Tools (C)		SC1 Communicate online		
Learning with Data Collection Tools (D)			SD1 Export data collected	

Lesson Completed (✓)				
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Teachers Record Book

The following is a sample page of a Teachers Record Book:

Chapter	9:Decimals (1)	Planned by:		Date Submitted:	
Time Frame	Term 3 Week 1 –Term 2 Week 3 (23 periods)	Class:		Seen by/ Date:	P/ VP/ HOD/ LH

LEARNING OUTCOMES/CONTENT		PROCESS				SOCIAL EMOTIONAL CLIMATE
Thinking Skills/ Heuristics	Instructional Objectives	Activity	Integration	ICT Tools	Assessment	HOM/CLS
Thinking Skills: - Translating - Relating	(1) Understanding Tenths (4 periods) Pupils will be able to: <ul style="list-style-type: none"> - read and write tenths in decimal form (1 decimal place) - represent and interpret tenths in region, number line and place value models - recognise 10 tenths = 1 one - write a fraction with denominator 10 as a decimal 	<input checked="" type="checkbox"/> Pupil's Book 4B, pp 8 to 13 <input type="checkbox"/> Workbook - Workbook 4B, pp 7 to 10 <input type="checkbox"/> Decimal Place value table <input type="checkbox"/> Number discs <input type="checkbox"/> Number rods <input type="checkbox"/> Mental Sums No: _____ <input type="checkbox"/> Conquer Maths No: _____	<input type="checkbox"/> NE: <input checked="" type="checkbox"/> ICT: Learning with <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Searches <input checked="" type="checkbox"/> Spreadsheet <input type="checkbox"/> Text <input type="checkbox"/> Multimedia <input type="checkbox"/> Communication Tools <input type="checkbox"/> Data Collection Tools <input type="checkbox"/> Others: (PI Specify) <u>Digital Textbook</u> 	<input type="checkbox"/> Internet Explorer <input type="checkbox"/> MS Word <input checked="" type="checkbox"/> MS Excel <input type="checkbox"/> MS PowerPoint <input type="checkbox"/> Datalogger <input type="checkbox"/> Digital Camera <input type="checkbox"/> Games <input type="checkbox"/> Simulations <input checked="" type="checkbox"/> Applets <input type="checkbox"/> Graphic Organiser	<input type="checkbox"/> My Pals Topical test No: _____ Date: _____ <input type="checkbox"/> Use of Interactive Whiteboard <input type="checkbox"/> LEAD Topical Test: Date: _____ Others: _____	Subj-specific HOM <input checked="" type="checkbox"/> Striving for accuracy <input type="checkbox"/> Thinking flexibly <input type="checkbox"/> Thinking Independently <input type="checkbox"/> Listening with understanding and empathy <input type="checkbox"/> Questioning and posing problems <input type="checkbox"/> Persisting <input type="checkbox"/> Metacognition (Thinking about thinking) Collaborative Learning Strategies: <input type="checkbox"/> CSLC <input type="checkbox"/> Send-A-Problem <input type="checkbox"/> Round Robin <input checked="" type="checkbox"/> Think-Pair-Share <input type="checkbox"/> Others: _____

(Adapted resource from Tampines Primary School)

Teachers Mid-Year Feedback Form

The following is a sample of a Mid-Year Feedback Form for Teachers:

Dear Teachers,

We are conducting a survey to find out to what extent you have integrated the Baseline ICT Standards into your lessons.

We value your honest feedback.

*Put a tick in the box for the option that best describes your experience.

1. How many baseline ICT lessons had you conducted?

	More than 4 lessons
	1 - 4 lesson(s)
	0 lesson

2. Where did you obtain your baseline ICT lesson resources?

	<p>Design my own</p> <p>How many? Please state : _____</p> <p>Which subjects? Please state : _____</p>
	<p>Adapt from what I already have</p> <p>How many? Please state : _____</p> <p>Please state : _____</p>
	<p>From edu.MALL</p> <p>How many? Please state : _____</p> <p>Please state : _____</p>

Teachers Mid-Year Feedback Form

3. What were the difficulties you faced when integrating Baseline ICT Standards into your lessons?

4. In what ways did the school ICT Trainer support you in your efforts to integrate Baseline ICT Standards into your lessons?

5. What other kinds of support do you need?

(Adapted from Zhonghua Primary School)

Pupil Lesson Observation Form

The following is a sample page from a Pupil Lesson Observation Form:

Name of Pupil : _____()

Class : (_____)

Please indicate with a tick if the child demonstrates proficiency / competency in the following ICT skills:

Area of ICT Focus	Tick	Remarks
Learning with Text		
<i>Creating, Editing and Formatting Text</i>		
- Change font colour	<input type="checkbox"/>	
- Bold and italicize text	<input type="checkbox"/>	
- Underline text	<input type="checkbox"/>	
- Highlight text with colours	<input type="checkbox"/>	
- Change font type	<input type="checkbox"/>	
- Modify font size	<input type="checkbox"/>	
- Insert punctuation marks	<input type="checkbox"/>	
- Insert symbols	<input type="checkbox"/>	
- Insert special characters	<input type="checkbox"/>	
- Create a text box	<input type="checkbox"/>	
Learning with Multimedia		
<i>Exploring a Presentation Tool</i>		
- Add new slide	<input type="checkbox"/>	
- Duplicate slide	<input type="checkbox"/>	
- Create a text box	<input type="checkbox"/>	
<i>Using Graphics in a Presentation Tool</i>		
- Draw an enclosed object	<input type="checkbox"/>	
- Change fill colour of an object	<input type="checkbox"/>	
- Apply a fill effect	<input type="checkbox"/>	
- Draw a line	<input type="checkbox"/>	
- Format lines	<input type="checkbox"/>	

(Adapted from Zhonghua Primary School)

Project Assessment Rubric

The following is a sample Project Assessment Rubric:

Subject: Inter-disciplinary Project for Mathematics, Science and Health
Education
Topic: Planning a Nutritious Meal

Skills Area & Evidence	Approaching Expectation	Meeting Expectation	Exceeding Expectation
Internet Searches Evidence: Bibliography	Limited resources mainly based on given keywords for research	A range of resources, based on own defined keywords	A range of resources, based on own defined keywords and from different search engines
Spreadsheet Evidence: Tabulated data	Limited to data entry, with data computed via other means (e.g. manual calculation)	Use basic operations (+ - * /) to compute and tabulate data	Use functions such as average, maximum and minimum to compute and tabulate data The table of data is formatted – with border and colours
Text Evidence: Report	Report with little or no formatting	Report is formatted with appropriate use of bullets and alignment Key information and headings are formatted appropriately (e.g. in bold, underline, italics)	Report includes table(s) and diagram(s)
Multimedia Evidence: Presentation slides	Presentation contains text and pictures	Presentation contains text, picture and media elements given by teacher	Presentation contains text, pictures and media elements sourced by pupils

ICT Competition on Internet Security

The following is a sample of an ICT competition on Internet security:

Internet Security Competition for Primary 3 pupils

Your Task: Design a PowerPoint presentation (maximum of 10 slides) on Internet security.

The purpose of this presentation is to help your classmates understand Internet security.

You should advise your classmates to

- keep their passwords secret
- protect their private information (e.g. phone number, address, identification number, personal photographs)
- check what others tell them before believing it is real
- be careful and not meet someone whom they've got to know online
- ignore any emails from strangers
- delete any file sent to them by a stranger

Due Date: DD-MM-YY

~ Attractive Prizes to be Won! ~

Rubrics for competition:

Area	Explanation	Points allocation
ICT skills	<ul style="list-style-type: none"> - Include music, effects, graphics and animations into the PowerPoint - Relevance of the music, effects, graphics and animations inserted 	50
Content	Relevance of the story to the theme of "Internet security" <ul style="list-style-type: none"> - Is the story creative and original? - Is the language clear, concise and error free? 	50
Total		100

(Adapted from Henry Park Primary School)

Pupil Self-Perception Questionnaire for Key Stage 3

ICT Self-perception Questionnaire

Name: _____ Class: _____ Term: _____

	I am able to...	I don't know how to do this	I can do this with some help	I can do this very well	I have done this for school work
		Please tick one			Please circle
A	Operate in an interactive media environment (e.g. applets, Geometer's Sketchpad, simulations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
B	Use search engines and keywords independently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
C	Create graphs or charts (e.g. pie chart, bar chart, line graph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
D	Edit and format graphs or charts (e.g. include titles and axes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
E	Use any built-in function (e.g. Σ , sum) to process data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
F	Create pages of text	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
G	Create tables or diagrams (e.g. shapes and lines, organisers) and pictures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
H	Edit and format page layout (e.g. page numbering, paragraphing, alignment)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
I	Produce multimedia elements by creating and editing using a simple applications (e.g. MS PowerPoint, Windows Sound Recorder, iMovie, Windows Movie Maker)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
J	Create hyperlinks (e.g. to websites, documents, videos and music)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
K	Communicate over a network or the internet (e.g. chat, forums, wikis, blogs, facebook)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
L	Transfer data or media from any device (e.g. datalogger, scanner, digital camera, mp3 recorder) to a computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N
M	Move data or media into any application (e.g. spreadsheet, photo editor, blogs, photo gallery)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y / N

ICT Tests by External Bodies

The following are examples of accreditation tests. The scope and the format of assessment differ from one to another. Schools are strongly advised to find out from the respective agencies on the scope to assess its relevance.

1. Test: National PC Driving Test (PCDT)
Agency: Accredited Test Centers by the Singapore Computer Society
URL: <http://www.scs.org.sg/NDT.php>

2. Test: Microsoft Office Specialist (MOS)
Agency: Microsoft
URL: <http://www.microsoft.com/learning/mcp/officespecialist/>

3. Test: International Competition and Assessment for Schools (ICAS)
Agency: University of New South Wales
URL: http://www.etc.unsw.edu.au/etc/about_icas

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 - Junyuan Primary School
 - St. Anthony's Primary School
 - Tampines Primary School
 - Tanjong Katong Primary School
 - Teck Ghee Primary School
 - Townsville Primary School
 - Xinmin Primary School
 - Yew Tee Primary School
 - Zhonghua Primary School

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By the Baseline ICT Standards Team