South Sudan

Secondary ICT 3

Information Communication Technology

Teacher's Guide

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How to take care of your books.

Do's

1. **Please cover with plastic or paper. (old newspaper or magazines)**
2. **Please make sure you have clean hands before you use your book.**
3. **Always use a book marker do not fold the pages.**
4. **If the book is damaged please repair it as quickly as possible.**
5. **Be careful who you lend your schoolbook to.**
6. **Please keep the book in a dry place.**
7. **When you lose your book please report it immediately to your teacher.**

Don'ts

1. **Do not write on the book cover or inside pages.**
2. **Do not cut pictures out of the book.**
3. **Do not tear pages out of the book.**
4. **Do not leave the book open and face down.**
5. **Do not use pens, pencils or something thick as a book mark.**
6. **Do not force your book into your schoolbag when it is full.**
7. **Do not use your book as an umbrella for the sun or rain.**
8. **Do not use your book as a seat.**

South Sudan

SECONDARY
3

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Contents

UNIT 1: SIMPLE WEBSITES

Specific learning experiences

The learners should discuss in small groups how to create a personal/simple website/blog. They should learn about the software tools used to create a website/blog and how to manage and update a website.

Individually, the learners should create their personal websites or blogs. In the personal website they might include things such as their family members and friends (names, pictures, and profiles), hobbies and photo galleries. In their blogs the learners should include their profiles and could post their opinions on current issues of interest for sharing and discussion. They should create galleries within which they could post and project cultural activities, e.g. video clips of local community dances, pictures of local environment, etc. In doing so, they should understand and take steps to avoid the risks involved in publishing personal information, oicing opinions, reputaatio privacy, and legal implicacats. They should explain what a website/blog is, identffy software tools used to create websites, and understand principles of website management and updatng.

Key inquiry questions

1. What is a website/blog?
2. How is a personal/simple website/blog created, managed and updated?
3. How could one use a simple website/blog to promote a personal profile?
4. How does a personal website contrast with a social network account?
5. What are the advantages and disadvantages of personal websites/blog?
6. How can (education) institutions benefit from simple websites/blogs?

Learning outcomes	
Knowledge and understanding	Know about appropriate sofware tools to create, manage and update a personal/simple website, e.g. blogs.
Skills	- Use sofware tools to create personal website/blog. - Be able to manage and update a website/blog.
Attitudes	- Appreciate the value of a personal website/blog. - Enjoy the art of website/blog design. - Appreciate the value of teamwork.

Contribution of the competencies	Links to other subjects
1. **Critcal and creative thinking:** in information a qquision and dissemination 2. **Communicaton:** in information sharing 3. **Co-operation** in team work 4. **Culture and identity:** in showing cultural symbols, features, and activities	1. **Fine Arts:** Design 2. **Languages:** Writing skills 3. **All Subjects:** Informaton sharing

Teaching simple websites

Note: all practical examples given in the learners' books arre actives that the learners should carry out on their own or in small groups with their computers.

You should provide opportunities for the learners to;

1. Reflect on learning, making reference to the learning objectve, with learners using self-evaluation techniques, i.e. discussing blogs features and presentations.
2. Address any misconceptions and teach from mistakes.
3. Set a short task that draws on learners' knowledge and allows them to assess their progress including giving them feedback.
4. Use knowledge acquired in the lesson to make judgements about new situatons, summarizing key facts, ideas, methods or vocabulary.
5. Present work briefly to others and you drawing out teaching points.
6. Do a skill based actvities linked to the objective.
7. Prepare for the next lesson/next topic/task.
8. Write in a class glossary or model written explanations.
9. Reflect on a challenge set at the start of the lesson (creatng a personal blog).
10. Answer true/false to a set of statements about blogging.
11. Mark work as a class/group/pairs, set homework and practical activity.

You should;

- Engage learners to discuss briefly what they have done, and then give them suitable feedback
- Assess the learners' work informally, and sort out any misconceptons or dificulties – particularly those learners who have no prior knowledge of websites.
- Review the main teaching points and summaries key facts, ideas and vocabulary.
- Make links to writtingng skills in which the learners will do in creatng personal websites, in art and design and in other subjects that relate to the scope of this unit.
- Discuss with the learners what is to be learned next.

- Set and discuss group activities. You can add extra activities for learners to work on.
- Reflect upon the lesson generally, and evaluate its success .

Setting clear learning objectves and outcom es is an essential poin within any episode of learning in this unit. This is best done at the beginning of this unit, and even beter if done following an engaging first minute style exercise. Remember to regularly come back to the objectves, as part of a mini-plenary and at the very end of the lesson as part of a meta-plenary of the learning.

You should use short actvity at the end of a lesson which is generally some kind of evaluative activity of what happened during the lesson. It could be as straightfoward as a quesson and answer exercise which would enable you to evaluate if the objectives had been met, and what the learners had actually taken in during the lesson. It could involve asking learners some questions which might make them think further about the lesson's topic. It could be a short quiz either a self or peer evaluation task. It rounds off the lesson and hopefully consolidates some of the learning. In this unit, it might be something like gathering all the work together (blogs created by the learners) and discussing which pieces worked really well as a whole group or even smaller groups of four and get ng them to point out what they think really worked and why. The learners should talk about how to improve and move forward as a group. This method is called **plenary.**

The aim of the plenary is to determine the level of learning that has taken place. This should not be confused with the completion ofthe tasks. Just because a learners has finished the work, it does not necessarily mean that they have learnt the information.

Effeecte plenary sessions are characterized by;

- Careful revisiting and consolidaaon of learnining objeces .
- Tackling misconceptions especially checking of the accuracy of learners' work.
- Summary assessment of what learners have learnt in order to inform and plan for the next step.
- Application of learning to new areas and links to past or future lessons.
- A shared, analytical evaluation of the work that learners have produced.

Learning processes in the plenary

The key inquiry questions or the learner should be :

1. **Recall** - what has been learnt?
2. **Summary** - what are the key points? (the learning highlights)
3. **Evaluation** - what do you think about what has been learnt? What are your feelings/opinions about what has been learnt? How important will this new learning be to you?
4. **Connectivity** - how does what has been learnt in this lesson link with other learning in this subject/other subjects?
5. **Application** - how could you use this knowledge? How might it help you?
6. **Metalearning** - what have we learnt about the learning process in this lesson?

This ensures clear learning outcomes are differenti ted and progress-focused objectives are built into the DNA of the lesson. For example when teaching WordPress the learners should know w hat WordPress does which is to make possible the building of a semantically structured website or a blog which makes the job of search engines easier therefore providing an excellent platorm for building everything from simple blogs, to significant news platorms. The biggest limit, usually, is the imagination of the developer creating themes and plugins, and the content writers (the students who will come up and manage the content).

You need to use plenary in this unit for;

1. The learners presentng their work briefly and talking about it. This applies especially to learners who have been working in groups or alone, relatively independently of you.
2. Reviewing the main teaching points and summarizing key facts, ideas, methods and vocabulary. It is vital that learners know what was important about the lesson and what needs to be remembered.
3. Addressing common errors or difficulues which ar arose. Often helping learners to identiy an error is a good way of reviewing the main teaching point.
4. Discussing where the work is leading and setting homework. Sometimes you can give homework which may consist of informal

tasks such as searching for the best blogs on the internet and noting them or identfying new trends in website building.

5. You need to plan for the plenary in order to have a focus, pace and a sense of purpose.

Introducing blogs

This unit is more than the set of its learning objectves. The learning objectives specify the skills, but there are also attitudes and knowledge to be considered. The startng point for this unit is the attitudes. What do you want the learners to feel about the topics? What changes do you wish them to contemplate in their thinking? Then the skills and knowledge are specified, often starting at a quite general level, then working down to specifics.

Without learning objectives it is difficult for learners to know what they are supposed to be learning.

The learners need to learn that a blog is an online diary or journal located on a website. The content of a blog typically includes text, pictures, videos, animated GIFs and even scans from old physical offline diaries or journals and other hard copy documents. Since a blog can exist mere ly for personal use, sharing information ith an exclusive group or to engage the public, a blog owner can set their blog for private or public access.

When a blog is made publicly accessible, anyone can typically find the blog through links available on the blog owner's individual or business website, their social media profiles, emails and e-newsleters and online keyword search engines. Many blog owners also set up blogs on websites devoted to the creation storage and sharing of blogs, such as Blogger, Live Journal, Tumblr and WordPress.

Blog content can appear as posts on one continuous treaming page or posts on individual pages reachable through one or more pages set up in a list-style format as post title lnks, excerpts and related tags. All posts or links to posts are typically displayed to readers in reverse chronological order with the most recent content appearing first.

The learners need to learn how blogs have evolved along similar lines to other forms of human communication that they are a product of convenience rather than design.

Through blogging the learners will engage people with different cultures in collaborative acvity, knowledge sharing, reflection and debate.

In this lesson the method or practice that you choose depends on the intended goals for a particular group of learners. You have a variety of choices not only about teaching methods but also about how you group learners for instructons: whole class, small groups, pairs, or individuals. A teacher's decision about grouping is usually determined by a lesson's goal or objectve. For example, if a lesson requires that every learner in the class have information that is not easily accessible and requires interpretation, you will probably decide to construct a lesson followed by discussion, including questions, for the whole class.

Teaching blogging

The learners need to understand safety issues in blogging

Which may include;

- First name only—not your last name.
- Do NOT share personal informaton about you or your school.
- Do NOT type email addresses or IM screen names.
- Do NOT type home addresses or phone numbers.
- Do NOT link to your personal blog or school blog, which might reveal informaton you do not want shared.

Quality Work

1. Think about who might be reading your blog entry, and make sure you are polite.
2. Make sure your blog entry stays on the topic.
3. Always make sure that you:

- Check your spelling.
- Check your spacing.
- Check your capitalizaton .
- Check your punctuation.
- Check your grammar and use of words.
- Be respectful of others' ideas.

1. Start with one classroom blog

One of the first questionshat you should ask yourself when starting classroom blog projects is, "Should I have each learners in my class create his or her own blog for expressing thoughts and ideas?"

The answer is a resounding no! For blogs to survive and thrive, they need to have a constantly updated stream of content—at least 2 or 3 posts per week. Blogs that are not updated on a regular basis lose the attention of readers, who have plenty of other options in today's digital world.

Because most learners will generally struggle to generate 2 or 3 meaningful posts per week—and because monitoring the content posted on 50+ blogs can be an overwhelming challenge for any teacher—it is best to start a classroom blogging project with one blog that every learners in the class can post to.

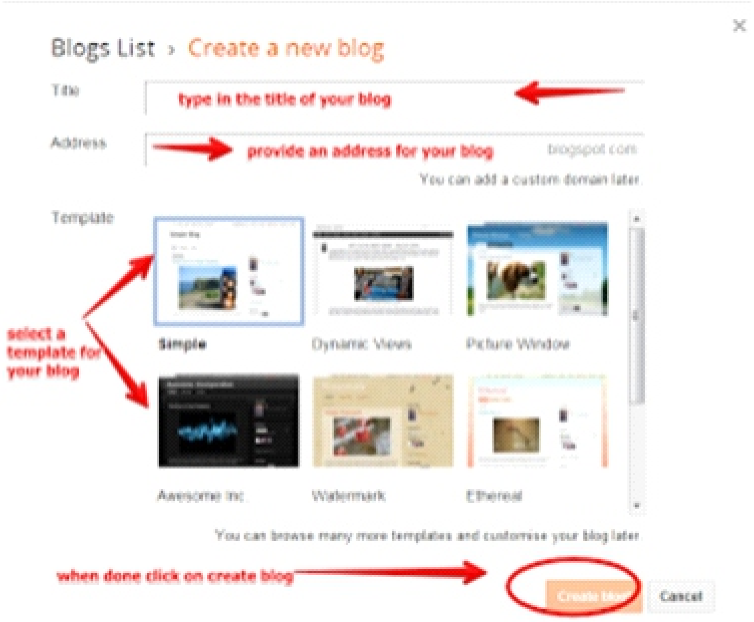
While you will have to work with one username and password—which could lead to inappropriate or unpolished entries being posted by learners that you do not completely trust—your chances of generating an audience for your learners are far greater when your learners are working together to generate content.

You can;

- Create a class blog so that learners can stay up-to-date on upcoming projects, due dates, events and other reminders.
- Publish learners' work on the blog, or have learners set up their own blogs as online portfolios.
- Encourage learners to post on a class blog weekly to develop their own voice and work on their writing.
- Post daily or weekly homework assignments on the blog so learners who were absent can know what they missed.
- Post discussion topics on the blog, give your learners a few days to reflect on the topic and comment.

Guide to setting a classroom blog

- ➢ First you need to have a Google account, if you have a Gmail account then that means you already have one. Head over to **www.blogger.com** and log in. Once logged in, you will land on a page click on "New Blog".
- ➢ Provide a title for your blog, then type in the address you want to use as URL, you need to keep trying till you find the one available. Next, pick up a template from gallery then click on "create blog" see snapshot below.



Blogs List › Create a new blog

Title: type in the title of your blog

Address: provide an address for your blog .blogspot.com

You can add a custom domain later

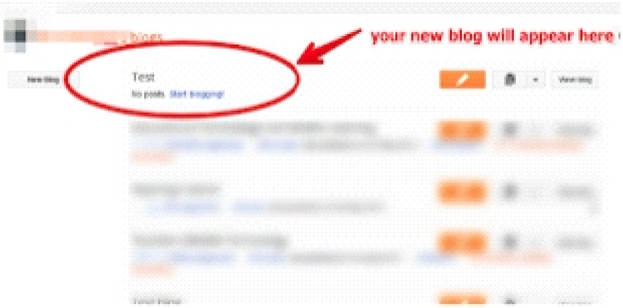
Template

select a template for your blog

You can browse many more templates and customise your blog later

when done click on create blog

- Now your new blog will appear in your blogger page as is shown in the snapshot below. The one created for this demonstration is named “test blog “see below. Now click on “start posting “under the title ofyour blog and you will be directed to a Blogger editor where you can type in your blog post.



your new blog will appear here

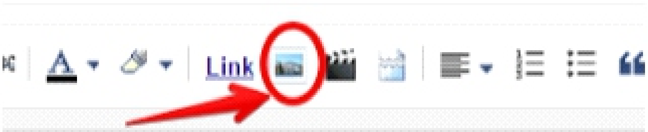
Test

No posts. Start blogging!

Here is what you can do on the editor:

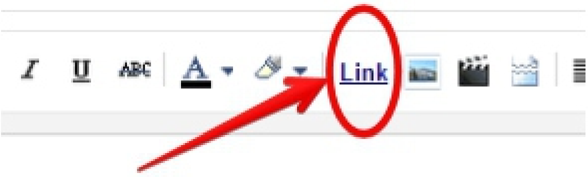
- **A- Insert Image**

  to insert an image click on the image icon as shown in the screenshot below.



B- Hyperlink a word or phrase

To hyperlink a word just highlight it then click on “Link" in the authoring bar and paste in the link as is shown below.

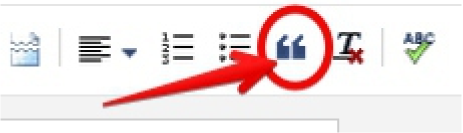


C- Insert Videos

There are two ways to insert videos into your blog post, check out this guide I published earlier on how to do it.

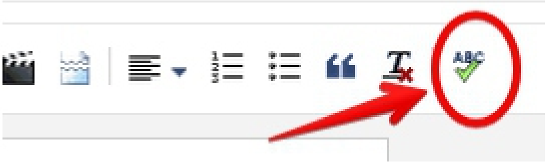
D- Add a quote

to add quotes to your post, paste in or type in the quoted chunk of text then click on the quote icon as shown below.



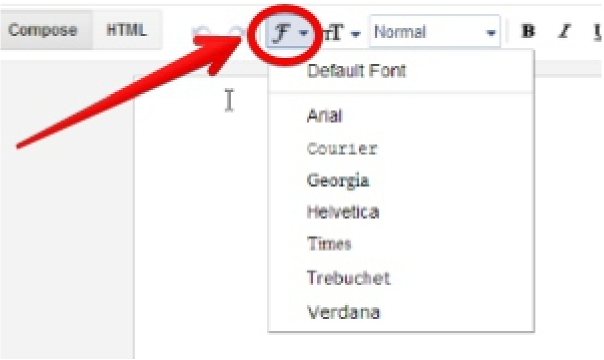
E- Check spelling

Blogger has an integrated spell checker, however this checker sometimes does not work correctly, so to make sure your post is error free click on "abc" icon and any misspelled word will be highlighted in yellow, click on it to correct it .



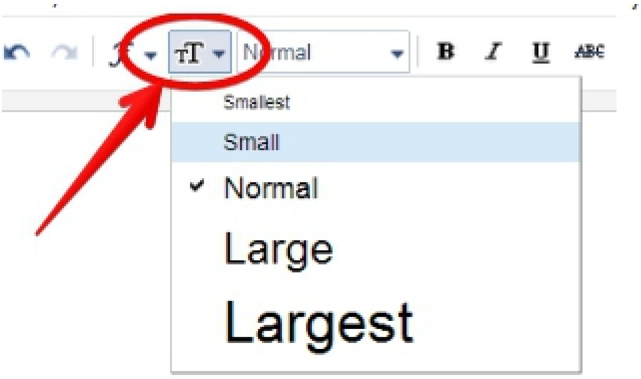
F- Choose Font

To select the font of your text, click on “F" icon and pick up the font you want.



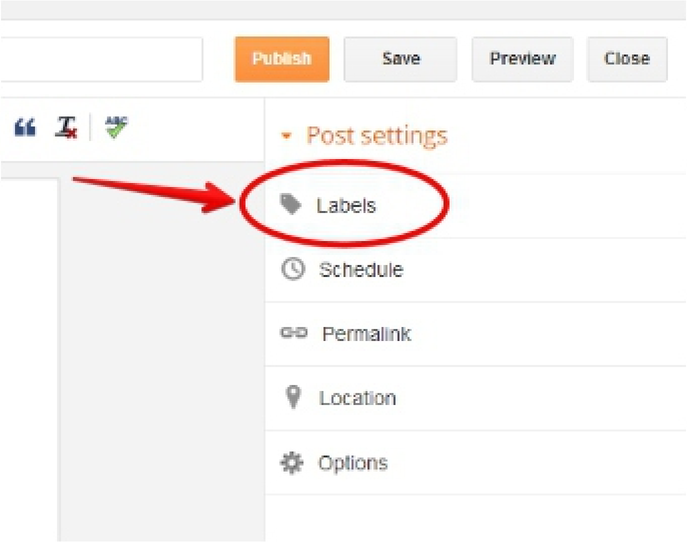
G- Change font size

To change font size of your text, click on the font size icon and choose the size you want.



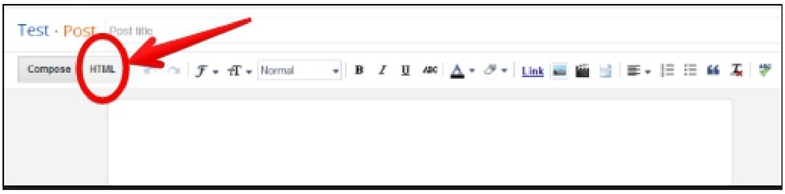
H- Label your post

Labels help you organize your posts into different categories. For instance, if I write a lifestyle I would label my post as: lifestyle or routine...etc. so that when I have several posts and want to look for a specific one I can easily find it based on the labels I used.



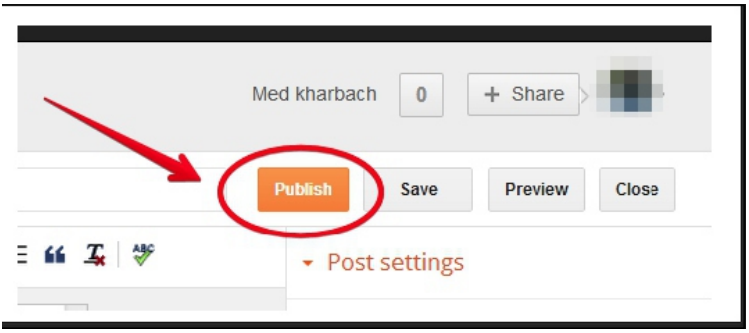
1-HTML

HTML is useful when integratin   “code snippets" of infographics and videos or slides.



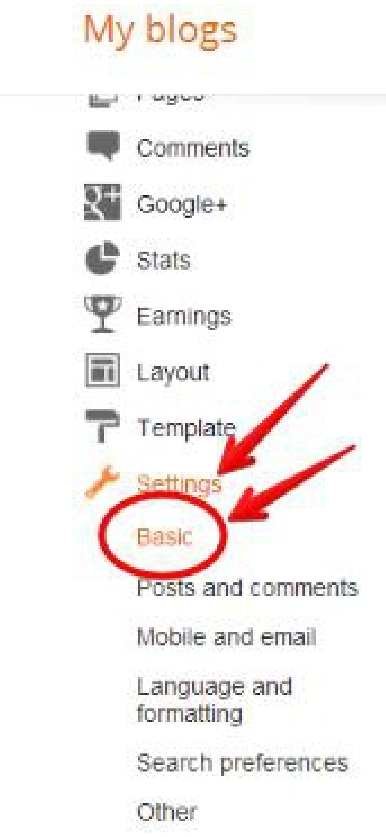
Share your Post

Once you are done with typing your post, you can then click on “Publish" and your post will instantly be available on the net.



How to customize the settings of your Blog.

To add authors to your blog, click on “setting” located on the left hand side then click on “basic ".



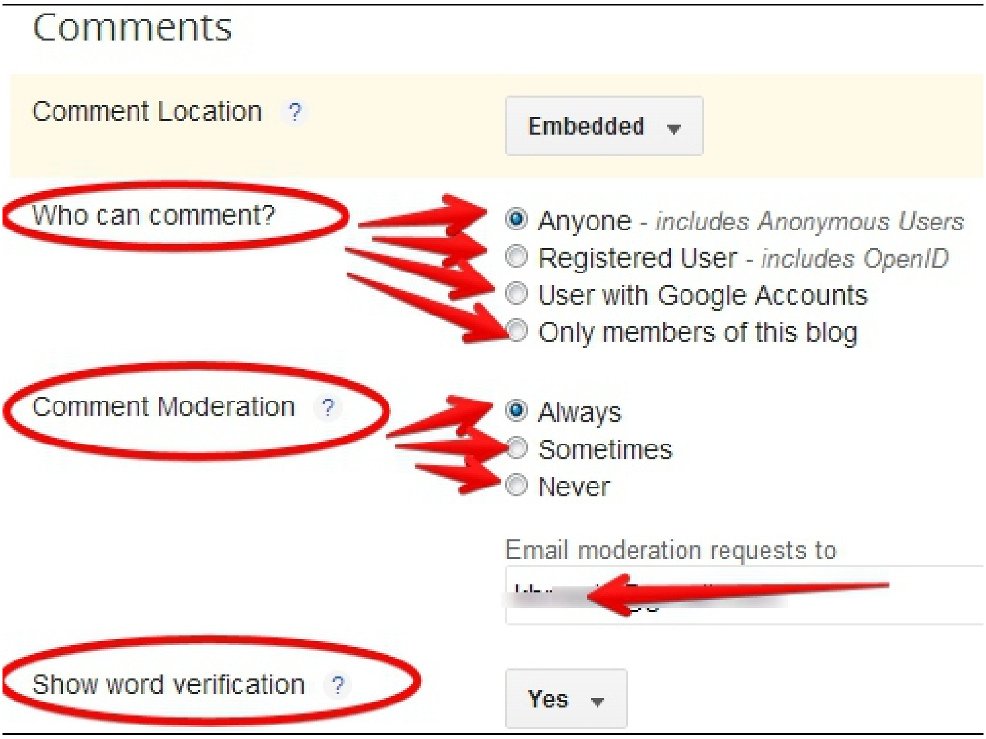
Now scroll down to “blog authors". Click on add and paste in their email or choose one from your contact list in Gmail.

Set Blog Readers

You can either make your blog open to the public by choosing " anybody : You can also restrict readers to only authors you have added in the previous step, or you can restrict reading of your blog to a set of people you select.

Adjust Commentng features

By default your blog will display a comment box below your posts. But you can work on who can write comments, you can also moderate comments before they are published and enable a word verificaaon captcha to fight off automated comments.



Comments

Comment Location ? Embedded

Who can comment?
● Anyone - *includes Anonymous Users*
○ Registered User - *includes OpenID*
○ User with Google Accounts
○ Only members of this blog

Comment Moderation ?
● Always
○ Sometimes
○ Never

Email moderation requests to
[redacted]

Show word verification ? Yes

2. Encourage learners to become regular readers of blogs

Learners must begin to see blogs as interactive forums for continuing conversations around topics of interest because interacti e forums require two-way partcipaaon.

That means the learners need to become avid readers of blogs, too. Consider organizing a collecton of learners' blogs in a public feed reader that the learners can visit during silent reading tme or while surfing the web at home.

Encouraging learners to read blogs writen by other learners serves three primary purposes:

- Learners who read blogs see models of writing that can be use as comparisons for their own work.
- Learners who read blogs are exposed to ideas for interesting topics that they may want to explore and write about in new entries for your blogging project.
- Learners who read blogs connect with potential udiences for their own ideas.

3. Teach learners to comment on blogs

As learners begin reading blogs written by other writers, you should systematcally teach the skills necessary for writtng effective blog comments because comments give learners opportunites to practice reacting to ideas in writtng. What is more is the comments left on entries writen by other authors which can serve as first drafs for future posts on their own classroom's blog. Finally, commenting emphasizes the community nature of blogging and draws reciprocal readers—people interested in looking closer at the ideas expressed by your learners—to your classroom's blog.

4. Promote learners blog entries to parents and colleagues

While writing for the Web ensures that the learners will eventually have readers from every corner of the globe, the vast majority of their blog's readers—and almost all of their commenters—are going to be the parents of learners, the learners in the classrooms of your colleagues, and educators that you have made connectio s with in faraway locaaons. Parents, colleagues and learners in classrooms just like yours have a stake in the learning that your learners are doing online. That is what makes them willing to read what your learners are writng and t o stop by to leave a comment every now and then.

Work hard to promote your learners' writngs with parents and colleagues. Send out links to pieces that you are partcularly proud of or that are likely to stim late exxcitinconversasat s. Ask parent vol unteers to stop by once a week and leave feedback for the learners who have posted new entries.

Not only do learners need to receive feedback in order to remain motvated by your classroom blogging efforts, but feedback from those who mater —moms, dads, teachers and best friends—is ofen far more meaningful than the occasional comment left by an outsider, regardless of where they are from.

5. Remind learners to respond to commenters.

As the blog begins to draw attention and starts to receive comments from readers, remind your learners to respond to each comment directly, either in the comment section of their original en try or in a new post on your blog. By responding directly to readers, your learners are showing their audience that they are listening—a key to encouraging return visits.

More importantly, however, responding to comments allows your learners to take advantage of the primary benefit of writting for an audience: The ability to have thinking challenged over-and-over again. Writers who make their core beliefs transparent are often introduced to new persspectives, and responding to those new perspectives —pushing back, refining original positions, arrti lalat misunderstandings—is a critical part of the cycle of true learning.

6. Emphasize the important role that quality writing plays in successful blogs

Because writing and publishing online is so easy—and because interactions between learners in electronic forums are often defined by casual grammar and language use—many learners approach blogging with a careless attitude, failing to invest significficant time into crafting polished entries. While they crave audience, they misunderstand the message that mistakes send to readers.

Not only should teachers interested in blogging projects encourage learners to work through the steps of the writingprocess (brainstorming, drafting, revising and ediit g) before publishing —just as they would on traditional tasks—you should also reinforce time-and-again that the credibility of writers is dependent solely on the quality of their written work.

Learners must know that the potential forhaving influence in online communitiese xists only when learners present ideas in ways that will impress readers.

7. Consider naming and training learners editors

You when starting classroom blogging projects may often enthusiastically jump in with two feet, encouraging classes to churn out doze ns of entries, promoting posts with parents and peers, and building new lessons with their blogs in mind.

Then, they end up buried by entries that are poorly writen or by learners who need technical help to get new pieces posted online. Eventually, they begin to question whether the time that they are investing in monitoring learners work for quality and in facilitating digital novices is really worth it. Enthusiasm is replaced by exhauston.

That is why learners who you will assign the role of editng are so important for successful classroom blogging projects. Training a handful—three to five per term—super motivated learners to proofread new entries and to support learners struggling with technical skills can ensure that teachers do not suffer from "monitoring burnout."

Over time, you will have learners who become veteran editors who take great pride in the blog that the class is producing. Not only will they contnue to write for the class once they have left, they will serve as competent gatekeepers, polishing entries that are not quite ready to be published, monitoring comments that are being posted, and generatin enthusiasm for the work that is being doing online.

8. Learners use pseudonyms while writting

For many schools and districts, the risks involved in introducing learners to tools for communication, collaborating and publishing content online far outweigh the rewards.

Frightened by stories of internet predators, restrictions are placed on the kinds of information that learners can reveal and the kinds of opportunites that learners can be engaged in online.

One step that you can take to keep the learners safe—and to comfort district leaders who question the decision to begin a classroom blog—is to teach learners about the importance of remaining confidential online.

Resist the urge to include the name of your school or yourself in your blog's tile. Refuse to link directly to any sites that readers could connect back to your classroom, and require that learners use pseudonyms to sign their writing.

Pseudonyms and confidentialty allow learners to try on different identies and to be judged based on their thoughts instead of their age or their social groups. And the first time that their work is mistaken for that of anyone older than they really are, your learners will be excited.

9. Schedule regular readers for videoconference feedback sessions

If you carefully cultivate parents, peers and colleagues as regular readers who stop by to comment on the work that your learners are publishing online, consider scheduling a videoconference to connect your learners to a real member of their audience. By inviting a reader "into" your classroom, you automatcally reinforce the idea that learners voice really does mater.

Have your digital guest to describe what it is that they like the best about your learners' blog. Encourage them to share specific entries that they thought highly of and content strands that were motivating. As for areas of improvement. Nothing can be more powerful to learners' writers than hearing from their readers—and hearing from readers is one digital step away.

10. Include and regularly explore visitor maps and statistics opage views.

To prove to your learners that they are reaching readers in faraway locations, be sure to include a visitor map in the sidebar of your blog.

While there are many services that will track the locaton of the visitors that land on your site, Cluster Maps (htp://www.clustrmaps.com/) is one of the most popular because it highlights each visitor with a red dot on a digital image of the world. Before long, red dots will cover entie contnents, reinforcing th e idea that your learners are being heard.

Cluster Maps also reports the number of page views that your website receives on a regular basis and can break those page view statisticdown by contnent. Consider asking learners to track this information carefully in their notebooks or on a classroom bulleting board. Watching your readership grow over tme will be just as motvaating toyour learners as seeing where their readers are coming from.

About WordPress

Understanding the WordPress

1. Guide learners in answering the preliminary questionstatement why should you use WordPress to create a blog?

2. Guide learners in identiying the different components and structures of a personal website and their functons.
3. Guide learners in identifying the different categories of tools used in WordPress.
4. Explain the functon of each tool.
5. Show actual sets of tools.
6. Guide learners on the proper use of different tools.
7. Instruct the learners to demonstrate the proper use of tools.

WordPress is a good sofware for creaating personal websites/ blogs because:

- It has a huge selection of plugins that can add new features and tricks to your site
- As the learners learn more about WordPress they will learn a lot about what it can (and cannot) do. But work within its relatvely few limitatons and you have a powerful and flexible website
- It is easy to learn how to use it
- It is stable and relatively bug free.
- It is used by millions of people around the globe
- It has a huge range of free and premium themes which can add functionality and style to your site
- It is not only for blogs, it can also be used to create fully functonal websites and it is free.

Assessing discussions

In creatng simple websites, assessing discussions should be.

1. The learners in groups must be put ng forward more than one point of view.
2. Each learner in the group must have the intention of developing their knowledge, understanding or judgement of the issue under discussion.
3. Learners must talk to one another.
4. Learners must listen to one another.
5. Learners must respond to one another.

WordPress.com vs. WordPress.org

The one major difference between WordPress.com and WordPress.org is who is actually hosting your website? With WordPress.org, You host your own blog or website. WordPress.org is where you will find the free WordPress software that you can download and install on your own web server. Getting your WordPress site set up involves purchasing a domain name, buying a hostingplan and then installing WordPress on your server. Most hostng companies provide instruc tio s or services to install WordPress for you.

WordPress.com, on the other hand, takes care of all of the hosting for you. You do not have to download sofware, pay for hosting, or manage a web server.

Pros and Cons of WordPress.com vs.WordPress.org

Both WordPress.org and WordPress.com have pros and cons, depending on your needs.

If you are not interested in paying for your own hosting, managing your own web server or paying someone else to handle that for you, you will probably want to useWordPress.com. It is free and easy to set up and you have lots of options for customizing your site. A few of the cons of using WordPress.com include that your domain will, by default include “WordPress.com.”

You also cannot upload any custom themes, plugins or modify the PHP code behind your site.

While WordPress.com is free to set up, they do offer several premium upgrades, including domain name registration (if you do not want WordPress.com in your domain name), the ability to upload videos and the option to use their premium themes.

Using the downloaded version of WordPress from WordPress.org opens up more control and flexibility for your WordPress site, but it also means more responsibility. Using a self-hosted version of WordPress means you can use your own domain name, upload and install themes and plugins, edit the code behind your site and have access to your site’s database (or files). Most of the showcase sites you see on the WordPress site showcase are the self-hosted version of WordPress, since many of them have unique functio ality or a custom made design.

Installing WordPress

In this session the learners should master the skill of installing softwares used to create websites. By following the steps given in the learners' book. Ask the learners to write the steps.

Using a quick-install service is a simple way to get your WordPress installation up and running, but the downside is that it does leave some security holes.

For that reason, you may want to consider installing WordPress manually.

The benefits of doing a manual installation are;

- It prevents the WordPress database tables being installed as a default, with default labels. These default labels can make your site more vulnerable.
- It allows for full customization of the wp-config.php file, which opens up enormous potental in WordPress.
- It allows you to work within the "best security practices" for your WordPress site.

WordPress Posts vs. Pages

A **WordPress post** is what makes up the 'blog' aspect of your site.

1. These are generally news or informatonal updates about a certain topic.
2. Posts are listed in reverse chronological order and can be tagged, categorized and even archived on your site.
3. WordPress posts are what make up the RSS content of your WordPress blog. So, when someone subscribes to your RSS feed, your posts will be the content that is delivered to them.
4. Think of the posts as the news portion of our site. They are dynamic and constantly changing the content your end users see.

WordPress Pages are similar to posts in that they have a title and body text, but they are different because:

1. They are generally reserved for static content or information.
2. Examples of this would be an About Me or Contact Us page.
3. Pages are not listed by date and cannot be categorized or tagged like WordPress posts.

4. Pages can have a hierarchy, which means you can nest pages under other pages by making one the "Parent" of the other, thus creating a group of pages.
5. Due to their static nature, pages are not included in RSS feeds and will not have date or time publishing.

Using Posts & Pages

Generally posts will be used for your blog content and pages will be used for standalone information that is not updated often. For example, an organizaton might use posts to handle news updates, press releases, job listi gs or new products. But they would use pages to list "about" information, services, contact info, team bios, locations or bylaws.

WordPress is flexible and you can use posts and pages however you want, but this gives you a basic overview of how they work.

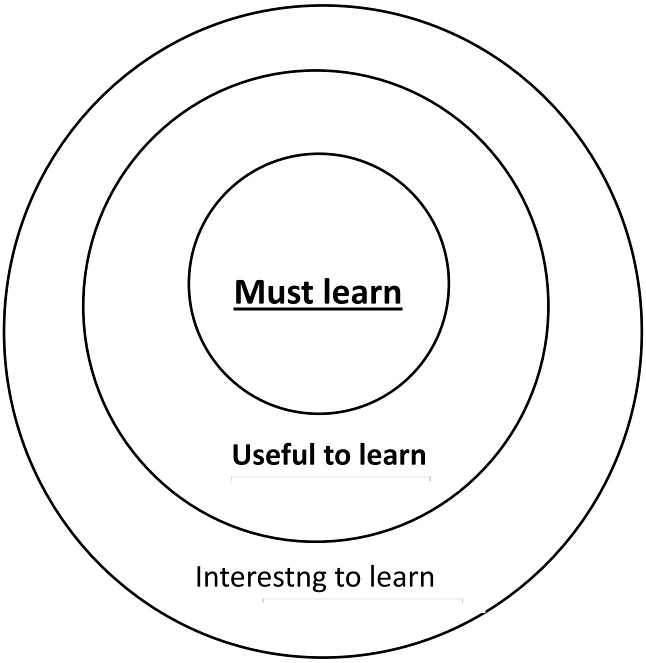
It is simply not possible to learn everything that is known about WordPress. However, some selecti n is essential for you to make.

What are the tricks that can drive more traffic to your blogs?

Learners need to be creative enough and explore various techniques of and ways for driving traffic to your blog which are:

- Promotion of content across platforms like Tumblr.com, Pinterest.com, Facebook.com, and more.
- Use Instagram to share the title of your blog post or image. Post images to platforms like Twier, Flickr, Foursquare, Facebook, and Tumblr.
- Giving short presentation of content on Slide Share and providing link to the content or blog from SlideShare.
- Pin your post to Pinterest contributors by using an atrractive title of the blog, image, hashtags, and adding keywords.
- Create a few seconds preview of your post like Vine or video which could be posted on Twiter a nd Instagram with a link to the blog post.

Evaluaton



"**Must learn**" is the target. These are the facts and skills that all learners need to learn in order to be competent in creati g simple websites.

You should stress the importance of these facts and skills when they are helping learners to learn. These facts and skills should be tested in examinations. There are very many other facts and skills that are " **useful to learn**", but they do not need the same emphasis. Nor should they be tested as thoroughly in examinatons. There are also very many other facts and skills that are "**interestng to learn** ". Of course, you should not prevent learners from learning anything. In fact you should show learners how to learn from books, conversatios with their peers or people on the field of ICT and researching on the internet. However, your main responsibility is to decide what learners must learn and to make sure that they learn it. Facts and skills that must be taught, are those that are needed to meet this unit is objectives competently and thoughtfully.

You must give learners opportunites to practice creating blogs and using WordPress and master these skills during the course of this unit. Unfortunately this practi e oen takes a lot of time and effort to organize. It may be quicker and easier to give a lot of class lessons in theory, but the learners will not learn the necessary skills. You should include enough time for learners to practce the tasks they need to learn.

Sometmes this will involve them in working in the community, Sometmes they can practce on each other in the classroom.

You must allow enough tme for this prractice.t is impossible to specify how much time is required for every task. However, most lessons should allow much more time for practi ing skills than for theoreticalteaching.

Evaluating lessons

Afer a lesson (or possibly a group of lessons), you should find out how much the learners have learned. This evaluation should be based on performance testing.

You should find out whether the learners can do the tasks that they have been taught to do.

If the learners cannot do the tasks, then you must improve, adjust or change the content of the lessons or the teaching m ethods.

What kind of assessment methods should be used?

It is important that assessment on this unit to be based on the job that the learners are learning to do. That is websites, blogging and general understanding of websites.

Therefore the assessment m ust test whether they can do the job. This approach is called performance testing. It means that assessment methods such as those based on multple -choice questionnaires and essays are used less ofen . Such methods usually only test the learners' knowledge.

Other assessment methods such as those based on case-studies and case-books are used more frequently. These methods test the important skills and attitudes.

Classroom assessment that is fair and provides accurate informaton about learners' achievement can serve to support instructonal and program improvement and increase learners motvaaon and ach ievement. Efffecve assessment occurs when there is a clear understanding of the knowledge and skills that the learners are expected to demonstrate as a result of their learning at each level of this unit.

1. The primary purpose of assessment is to improve learners' achievement.
2. Assessment continually guides the development, implementation and support of instructIon.

3. Learners need to receive timely, specific and directve feedback in order to meet the grade/course expectatons and assessment targets.
4. Diagnostic assessment of content knowledge, skill level, and use of literacy, numeracy and metacognitive strategies will serve as baseline data and inform instructional starting points.
5. Formative assessment provides valuable feedback to the learners, parents/guardians and the teacher by outlining strengths and needs required for the next step.
6. Summative assessments or assessment of learning provides learners with multiple and varied opportunities to demonstrate the full extent of their learning.
7. Evaluation occurs at the end of a grading period and is reported as a number (percentage), level, or leter grade in accordance to the achievement chart.

Summarizing this unit

Summarize this unit by guiding the learners through the glossary section at the back of the learner's book. The learners should read the key words and terms used under the unit simple websites.

Summarizing teaches learners how to discern the most important ideas in a text, how to ignore irrelevant information and how to integrate the central ideas in a meaningful way. Teaching learners to summarize improves their memory for what is read.

This will;

- Help learners to learn and determine essential ideas and consolidate important details that support them.
- Enables learners to focus on key words and phrases of an assigned text that are worth noting and remembering.
- Teach learners to take a large selecton of text and reduce it to the main points for more concise understanding.

UNIT 2: SOCIAL NETWORKS

Specific learning experiences

In small groups the learners should discuss their experiences and knowledge about the social media, such as Facebook, Twiter, YouTube, Instagram, Wikipedia, etc., the types of social media and the importance of social media in today's world.
The learners should learn about social networks, such LinkedIn. They should learn that social networks are social structure made up of a set of social actors, such as individuals or organizations.Individually, they should create own accounts, e.g. in LinkedIn, Google+, Learners Circle Network, etc., write their profiles, jobs preferences, and interests. They should make their connectons to friends and peers by inviting them to connect. They should also learn how to update and manage their accounts regularly.
They should understand social networks and their roles as individuals in professional networking. They should be able to identiy the types of social networks that suit their interests.
The learners should understand security and privacy issues in social networks and understand the ethical issues and legal implicatons.

Key inquiry questions

1. What are social networks and how do they contrast with social media?
2. How do social networks service communites with common interest and goals?
3. What are the risks involved in interacting in ocial networks?
4. How could individuals and instiuuons benefit from social networks?
5. What impact have virtual social networks had on the traditional network institutions?

Learning outcomes	
Knowledge and understanding	Know the purpose of and how to use social networks by creatng personal profiles and interacting via, e.g. LinkedIn, Google+, Learners Circle Network, etc.

Skills	• Explore social networks • Be able to join social networks • Be able to interact in social networks • Analyze risks in accessing social networks • Contrast different social networks
Attitudes	• Appreciate the role of social networks • Value the regulations governing sharing of data and access to information • Respect privacy • Awareness of cybercrimes and legal implications • Enjoy innovation

Contributions to the competencies	**Links to other subjects**
1. **Critical thinking:** about social networks, ethical issues and legal implications 2. **Communication:** in interacting in social networks 3. **Co-operation:** in information sharing	1. **Languages:** Writing skills 2. **All Subjects:** Information sharing

Aspects of the plenary	**Suggestons for improvement**
Reflection	• Review the main teaching point using some of the learners' work • Start with a common error or misunderstanding and review the main teaching point and key task. • Emphasize what the class has learned and what to remember. • Get learners to say what was easy/difficult/enjoyable/ important about today's lesson, and what they have learned.
Forward planning	Talk about how the class might: • extend what they did today • go back over some of the key ideas and do some practce • start a new topic • do some linked work at home
Learners presentng their work	• Ask the learners to write the hardest or the easiest question t ey had to do on the board • Before the plenary give some learners a poster or a strip of paper to record some of their work so that they can display it at the end of the lesson. • Ask a group to show their work and then to choose a queston to ask the rest of the class . • Choose a learners or pair of learners to explain a strategy they have been using
Assess and give feedback	• Discuss their work with a group of learners • Help learners to mark their own work • Use the work done by a learners or learners to comment on a method or way of recording
Links	• Make links to work in other subjects • Make links to previous lessons and the next lesson.

Teaching social networks

You should establish ground rules with learners regarding online safety, ethical issues, security and privacy issues involved in social networks. The learners need to know that whatever they put online is permanent. Everything they post, tweet, text or send using an app leaves a public digital footprint.

You should limit when the learners can use this social networking sites. For example, prevent usage during class, during meals, vacations, or after 9 p.m.

You should establish a model profile, and demonstrate proper online behavior. Learners respond beter to a set example that they can emulate. It is important that you keep a current record of learners' login information, including all email addresses, login names, display names, and passwords.

It is important to know what social networking site the learners are downloading. Some of the apps/websites encourage risky behavior which can be dangerous.

You should regularly check your learners' network of friends on each social networking website. If there are people on the list that you do not know, ask the learners who they are and how they met them. Remove "online only friends" from learners' profiles. Look at the profiles of friends to see what they reveal about the learners.

Frequently check the content of the learners' profile. Are the learners postinginappropriate personal informaati , photos, videos, blogs, or comments? Are the learners engaging in harassing or other inappropriate conduct? If so, remove the content.

You should regularly check the account sett gs on the learners' profile. Make sure settings re on private and take note if any users are blocked. For example, you can modify the "Privacy Settings" to make the profile "private," or to check on users whom learners has blocked. You should make sure that the learners are not sharing their current locaton.

The learners should come to you with a problem right when it occurs, so that you can help fix it. Things can get out of hand quickly online. Let the learners know coming to you is safe and that you will always listen and help.

How can you help learners to learn social networks?

Clarify; be specific on the expected outcome of each learner set the objectives clear on what you want to cover by doing so the learners must be obviously be able to hear what you are saying and read what you write. In most cases teachers believe that what they say and write is clear-but are they right? Can the learners read what you write? Look at your board at the end of a lesson and see whether it is set out clearly. Can you read your own writing? If you cannot, the learners definitely will not be able to. The learners may be able to hear the words you are saying but not understand them. If you use words that are unfamiliar to learners or speak a different form of the language, it will be difficult for them to learn. You should make sure that class communicaton is in a language that the learners can understand.

1. Can the learners hear what you say and read what you write?
2. Do you use simple language?
3. Do you use visual aids?
4. Do you summarize the main points?

Making your teaching meaningful to learners

The following questons can be used to generate small group or class discussion, either in a face-to-face environment or on the social network discussion forums, about Internet Safety, appropriate/inappropriate online behavior, social networking, and digital citzenship.

1. You should relate social networks to the learners' lives.
2. You should give lots of examples?
3. There is a need to relate the lesson to the activity the learners will be doing?

Actve learning

Learners may learn very litle when they listen to you during the class giving a lesson. They may however, learn a litle more if you writes on the board and uses diagrams and pictures. In this way the learners can see what they have to learn as well as hear it. But stil rather little is learned. To help the learners learn you should give some exercises to do, such as creating their own account on social networks, posting poor commenting an artcle on a social website, answering questons, writting notes or explaining an idea (to a friend or to the whole class).

The learners will also need to practce the skills taught to them during the lesson. The importance of these practical exercises are of great importance to the learner in achieving this unit's objectives.

- You should engage learners frequently to answer questions.
- You ask learners to apply the skills acquired to solving problems in the society.
- You should arrange the learners in and in pairs to practce thinking and solving practical skills.

Some exercises and activities will be more helpful than others. As a rule, they should make the learners use informaton rather than just repeat it. Active learning can also be used.

There are many different kinds of activities which are useful for different kinds of objectives. You can ask groups of learners to discuss and brainstorm how they would use social networks to conserve the environment.

All these methods will give you more work to do, but they will also help learners to learn and master the necessary skill.

Giving feedback

When learners have done a piece of work, you should tell them whether they have done it well. You should also point out any errors or faults and explain to the learners how the work could have been done beter. Feedback can also come from writen material.

If you give guidance to the learners, they can emulate this and give feedback to each other.

The first point is that if learners only listen to a teacher talking, there is nothing to give feedback on. So feedback and actvity go together. To give feedback, you must first arrange for the learners to do activities that can be assessed. This means that there should be frequent tests of the learners' ability to do the practica tasks required, to remember the necessary facts, and to use those facts in solving problems or communicating. These tets may be formal examinatons. If these are held, you will have to do a lot of extra work and the learners may become interested only in passing examinations and forget the real reasons for their training. A beeer way is for the activities nd feedback to become part of the normal papern of teaching. The learners will be able to assess their own performance or that of other learners if they are given guidance by you. The feedback should usually have three parts.

1. You should tell learners how well they are doing.
2. You should point out any errors or faults in the steps.
3. You should explain how learners could do beter work.

Ensuring mastery

You should make sure that all the learners know the facts and skills that they need at each stage. Ideally this is done at the beginning of each lesson. When teaching some topics, the learners may need to have understood ideas taught in an earlier lesson. For example, if you are discussing a security and privacy issues in social networks, the learners will need to know what security and privacy issues are. These ideas may have been taught some timeago, so the learners may have forgotten or possibly never have clearly understood. This means that they will not be able to understand the discussion. To overcome this difficulty you should check at the beginning of the lesson that all learners know the necessary facts and skills. Do not ask "Does everybody know about security and privacy issues in social networking" If you do, the learners will probably say "yes", whether they understand or not. Nobody likes to admit that they do not know something. Instead you should give a very short test. For example, you could write some terms and ask the learners to explain. You should also find out how much learners know at the end of the lesson-or even beter - at various stages during the lesson.

Again, do not just ask "Do you understand?" Instead ask the learners to use the skill or tell you the facts. This technique may seem obvious. Majority of the teachers think that they do “ensure mastery". In fact if you talk to learners and find out exactly what they know, you may be surprised at how litle they remember from previous units. In ensuring mastery you should.

- Check that all your learners understand what is being taught at various points of the lessons.
- Frequently check whether every learners has learned the necessary skills and knowledge.

Individualize

Some learners may be very good at learning facts but rather poor at doing practcal work. Others are the opposite. Some learners can learn from books, while others prefer to listen to you talking. Other learners learn best by practical experience of doing the job. However, schools my ofen treat all learners as if they were identical.All learners go to the same teaching sessions. There they listen to the same lesson and then do the same practical work. It is much simpler and cheaper to treat all learners in exactly the same way. It is also easier to keep control of their whereabouts because the timetable will say where every learners should be at any given time.But is this the most effective way of learning? Does it prepare learners to take more responsibility for their own learning?

Remember that learners will finish school eventually and they will usually need to work and learn on their own.

You should make sure that there is enough tme for learners to learn on their own. This would allow the learners to learn at their own pace outside the classroom.

You may use different teaching methods. Some learners learn beter from books, while some learn beter when topics are discussed in a group. Some learners learn well from films or film-strips (if these are available).It is not usually possible to give a choice of teaching methods. However, you can use a variety of methods and so meet the needs of a larger number of learners. You should allow learners to work at different speeds and encourage learners to learn in their own way.

You should make more use of project work by setti g learners a large-scale task such as creatng a social network account and write a profile, job preference and interest. Project work allows a lot more scope for learners to learn in their own way. You should talk to learners individually because some learners may be confused by one idea while others find the idea quite easy to understand so that the learner can be able to explain the idea, or tell the learners where to find the relevant information.

Notes can also be used in practical work to remind learners of the skills that they need to learn.

Caring

1. Do you show the learners that you care whether they do well?
2. Do you prepare thoroughly for teaching sessions?

3. Do you listen to learners' comments about your teaching?

Using discussion to teach social networks

While teaching social networks it is of great significance that the learners learn to cultvate good discussion skill so that they can be able to interact in social networks. Discussion is an orderly process of face-to-face interacti n in which learners should exchange ideas about an issue for the purpose of solving a problem, answering a queston, enhancing their learning, or making a decision.

In order for an exchange of ideas to be called a discussion, it should meet five cconditions:

- Learners must talk to one another.
- Learners must listen to one another.
- Learners must respond to one another.
- Learners must put forward more than one point of view.
- Learners must have the intention of developing their knowledge, understanding or judgement of the issue under discussion.

Discussion can be considered as co-operative thinking aloud. Because learners are expected to share their thoughts as they discuss academic issues, discussion is both active and learners centered learning.

Discussion can be used in many different ways, either as part of a lesson, as a whole lesson, or integrated with one or more other teaching strategies.

Using discussions as a teaching strategy

A discussion can either focus on solving a problem or focus on exploring an open-ended issue.

Some of the most appropriate tmes for whole class discussions may be:

- When you want learners to develop a sense of ownership over their new knowledge and responsibility for their own learning
- When you want learners to think critically bout the subject and develop their skills of analysis, combination and assessment, rather than just memorize facts

- When you want learners to develop their understanding by drawing on their prior knowledge and experience
- When your aim is to develop learners' communication skills such as stating their ideas clearly, listening to others, or responding appropriately to others.
- When there is a need to develop a sense of group identty so that the learners can support each other in their learning.

Advantages of using discussion in this unit

1. Discussions actively involve learners in learning and because of this, learners can feel that they are making a real contributon to their own learning. A discussion is more likely to maintain a learners' interest than a passive teacher directed learning experience.
2. Active involvement in learning motivates learners, especially when they see that others value their contributions and respect their point of view.
3. Discussion can be an effective way to help the learners develop socially acceptable means of interacton , such as listening, speaking politely, and respecting the views of others.
4. Discussion can result in more learners learning than some other strategies. This occurs because, as learners verbalize their thinking, they are able to construct or reconstruct knowledge in a way that makes sense to them.
5. Discussion can be an effective way of allowing learners to share their knowledge and experience.

Some limitatons of using discussion

It is not always easy to conduct a discussion, and like other teaching strategies, discussion is not suited to all teaching situations especially in this unit where the core objectves are skills based, learners have to learn how to engage in learning through discussion.

1. Discussions are unlikely to be productive unless learners are well prepared, and that usually requires them to do some prior reading or research.
2. It is easy for talkative learners to dominate the discussion
3. In most discussions, there will be opportunities for learners to get 'off the track' and you may need to remind them of the focus of their discussion.

4. Some learners may be reluctant to partcipate in discussions.
5. Some learners may not have sufficient command of the language of the subject, or understanding of the key concepts of the subject, or critical thinking skills to join in the discussion.

What to expect of learners during a discussion

The learners should listen attentively- It is important for learners to understand that discussion is a collective learning experience that depends on co-operation and objective thinking. Listening carefully is an important part of discussion work and learners should be taught and expected to listen to their peers. If they do not, they will not know if their thinking about the topic is similar to the thinking of others, and time may be wasted through unnecessary repetition of ideas

The learners should be objective – you should encourage learners to make rational, logical, objective cotributions, and help them to see why emotive contributions are less desirable. Encourage learners to raise questons, offer objective opinions and listen carefully to others.

Learners need to talk enough, but not too much - Encourage learners to contribute, and the best way to do that is to make them feel their contributio s are worthwhile. On the other hand, no learners should dominate the discussion.

The learners should be interactive - During a discussion, learners will spend tme thinking, but the important part of the strategy is that each learners needs to interact with the other learners, with you and with the subject being discussed. You want learners to be participants in the discussion, and also be observers who are aware of what is happening around them, so they can contribute in a positive way.

Effectiveness of discussions

To use discussion as an effective teaching method, you need to evaluate discussion lesson as soon as it is complete. Some questons to ask:

- Were the learners enthusiastic a out the discussion?
- Did the learners achieve the goal that I set for the discussion?
- Did the learners ask relevant and logical questons?
- Did all learners have the opportunity to contribute?

- How could I make beter use of this teaching strategy in future lessons?

Problem solving using Social networks

This is a technique in which problems are used deliberately as a means of helping learners to understand or gain an insight into the lesson they are studying. When problem solving is used as a teaching strategy, the emphasis should be on learners learning about the subject, rather than simply learning to solve problems.

Problem solving can be seen as the process of applying existng knowledge to a new or unfamiliar situation in order to gain new knowledge. A problem can be defined as any situation in which some informamon is known and other information is needed, so problem solving is a form of enquiry learning. When used as a deliberate teaching strategy, problem solving can help learners to realize that the knowledge they have already gained can be applied to new situation, and that this process can lead them to gain new knowledge.

Key features of this technique should be:

- Learners should work individually or in small groups.
- The task should require realistic problems to be solved (cross cutting issues), preferably a problem that has many possible solutons. For example Applicaton of the knowledge gained in social network to solve critcal prob lems facing the community.
- Learners should use multiple approaches to learning.
- The results of the problem solving should be shared among all the learners.

Evaluating problem solving strategies

You should evaluate the learning from practcal problem solving activities.

- Learners should understand that they were solving problems in order to learn something important, and not think that they were just finding answers.

- The learners should be willing to take risks in exploring new ideas through social networks. are the learners prepared to be wrong, are they tolerant of each other's errors?
- You should encourage learners to persist and figure out ways of solving problems in the community for themselves.
- You should give learners primary responsibility for their learning during the problem solving sessions.

Key outcomes

1. You should guide the learners to develop meaningful solutions to problems which will lead to greater understanding of the social network.
2. You should give learners the opportunity for problem solving which provides a challenge for learners. The learners will gain a great deal of satisfaction from discovering new knowledge for themselves.
3. By solving problem through social networks the learners will be actively engaged in learning.
4. You should teach the learners how to transfer their knowledge to real-world problems through social networks.
5. You should provide problem opportunites for the learners to solve this will help to make learners responsible for shaping and directing their own earning.

UNIT 3: PROGRAMMING

Specific learning experiences

The learners should learn about programming and computer programming languages (a specific programming language, e.g. visual basic).
They should learn to convert simple numerical algorithms such as those for solving quadratc equaati s into a program, and understand data types and structures.
Individually they should write a simple program in visual basic to print a message e.g. ‘Hello world’ on the screen of the monitor.
Individually or in small groups they should write a program to compute the solution for t e quadraaticquauon (y= a_0+ a_1 x+a_2 x^2).
They should understand ethical conduct in computer usage (copyrights) and the legal implicatons, such as intellectual property rights.

Key inquiry questions

1. What is programming?
2. What is an algorithm?
3. How is a simple computer program designed and created?
4. How is a numerical algorithm translated into a computer program?
5. What is the ethical conduct in the computer usage (copyrights)?

Learning outcomes	
Knowledge and understanding	• Know how to write a simple program, e.g. to print ‘Hello world’ on the monitor, and compute quadratc equaation. • Understand ethical conduct in computer usage.

Skills	- Be able to write simple computer programs - Perform the conversion of a numerical algorithm into a program - Recognize ethical issues in computer usage
Attitudes	- Enjoy programming - Respect intellectual property rights

Contribution o the key competencies	**Links to other subjects**
1. **Critcal and creatve thinking:** in solving numerical problems, and ethical issues 2. **Co-operation:** in teamwork	1. **Mathematics:** Formulas and algorithms 2. **Languages:** Grammar and syntax

INTRODUCTION

Programming learning is recognized as a complex activity y a large number of learners. To program, learners must acquire some basic knowledge as variables and data type's concepts, programming languages, control structures. Although this knowledge is transmited by you, many novice learners cannot use them when asked to solve a programming exercise. There could be several reasons that contribute to learning diffificues, like the programming language syntax, learners motvaaon level, mathematc al and science background, but the real problem is "putting all pieces together" composing and coordinatng components of a program. learners learn beter if they have an actve behavior, opposed to the passive behavior which you can find frequently in traditio al classrooms. In programming this means that the most important actvity for learners is creating their own programs. In other words, programming is the best way to learn how to program. However, this approach demands much effort and persistence and many learners look for easier ways, like asking the solution from colleagues.

You should introduce basic programming concepts through a familiar environment. Animation/simulation educational tools, such as Interactive Data Structure Visualization, try to help learners to beter understand programs through the utlization of aphical representations. many of those tools can be very useful during initial programming learning, especially for learners that after some inital teacher support can progress in their learning, and can be independent in their work. However, many learners show deeper difficicues and need a stronger support to solve basic problems. In those cases common educational tools usually fail because they rely in the learners' ability to create initial solutions to the proposed problems. Learners that cannot create those initial solutions need a different kind of support.

You should introduce the learners to the various steps of the programming process (Requirements, Specification, Code Design, Coding, Testng, Debugging, Release, Maintenance, Revision and updating)

In this unit the plenary should allow time or:

1. **Feedback**
    - Assessing, formally and informally, some of the learners' work and what has been achieved.
    - Sorting out common misconceptions and errors.
    - Marking together some of the writen work and rectifying any errors.
    - Commentng on the work of learners who have worked independently of you.
2. **Reflection**
    - Review the main teaching points.
    - Summarizing key facts, processes and ideas.
    - Discussing what to remember and how to remember it.
    - Emphasizing the mathematical vocabulary used
3. **Forward Planning**
    - Planning follow-up work or deciding what is to be done next.
    - Setitng or adjusting targets for the class, groups or individuals.
    - Outlining any out-of-class work or homework, or further research.

Five simple techniques to use in the plenary

1. The block it review technique

Pair up learners and ask them to tell each other

- 3 things I learnt.
- 2 questions I want to ask.
- 1 thing I already knew.

2. The key learning point technique

Ask each learners to quickly jot down (or simply think of) the most important thing they learnt in a particular sesson. Then share this with a partner: see if you agree; say why. You have 45 seconds to convince the other person that your key learning point is the most important. If learners agree, go on to the second key point. This simple exercise could then be extended by joining up two pairs to make a four and repeatng the process.

3. Extending learners' thinking through queston formulation

One way of assistng the learners to think about and review their learning is to ask them to formulate some questions about what has been learnt in the lesson. Working in pairs learners can then actively revisit learning through questioning each other. Through the process of creating their own questions learners are given a valuable opportunity to think back over and make sense of what has been learnt.

4. Facilitatnig active, cririal listening skills

Plenaries provide an opportunity for learners to share the work they have produced during the independent part of the lesson. Clearly it may not practicable for more than a few individuals or groups to share their work. The danger is that those who are not 'presentng' become passive and switch off. In order to counter this, you can give those listening an active role by asking them to listen out for a key feature and report back to the class at the end of the presentation. Different learners, or groups of learners, are given a card that informs them what they are listening for. The listening focus should link closely with the success criteria for the task which learners should be provided with prior to beginning the task.

5. The self-reflection of learning tool

This is a model produced by Shirley Clarke that involves learners, either individually or in a pair, assessing their own learning within a lesson.

- Do you remember the learning intention of the lesson?
- What did you find difficult?
- Did anyone or anything help you move on to learn something new? (friend, equipment, resources, teacher)
- What do you need more help with?
- What are you most pleased with?
- Did you learn anything new?

Plenaries and metalearning

A plenary session also offers the learner a valuable opportunity to facilitate a study about the act of learning.

- ❑ *What have you learnt about the way in which you learn in this lesson?*
- ❑ *How did working with a partner help you understand/master a skill?*
- ❑ *What did you do when you were stuck?*
- ❑ *What skills/techniques/strategies did you use to learn programming?*
- ❑ *How will you be able to remember what you learnt about programming?*

If an ongoing study about the learning process is a regular feature of lessons, learners will begin to acquire knowledge about how to learn which they will be able to apply in lessons and in other contexts outside of school.

Plenaries and homework

It is also reasonable to use plenaries to clearly explain an activity that is directly linked to the lesson that has just taken place. Homework or a practical activity should provide opportunites for learners to:

- Apply what they have learnt.
- Consolidate something that has been learnt.
- Reflect on what has been learnt.

Extending learners' knowledge and understanding.

Plenaries offer you an opportunity to go over some of the new topics and sub-topics that has either been introduced or has emerged during the course of the lesson. You should consider three broad categories of topic extension which they can consolidate during the plenary:

- Subject specific topic.
- General topic.
- Topic relating top rocesses and skills.

Planning a plenary

You should plan out an idea for some kind of a plenary in all lessons in this unit. Planning might include reference to:

- The learning objectives for the lesson or a series of lessons, including identiying what different gro ups will learn.
- The key questions to be asked to support assessment in the plenary.
- The vocabulary to be consolidated.
- How this lesson links to the previous one/the next one/other lessons.

You should be prepared to display flexibility however, and amend or change the plenary according to what has been assessed through the observations made during the lesson. It is important to respond to what has taken place in the lesson. You should focus upon responding to the learners' learning and the diffificues in learning that have been observed.

Plenaries and targets

Relevant opportunities n plenary sessions should be exploited in order to maintain learners' focus upon their learning targets.

- Termly whole class curricular targets.
- Specific targets for groups of learners.
- Individual Educaton Plan targets .

Using visual ways of refllecng upon learning in plenaries

Drawings are a particulaly useful way of assessing what learners have learnt. The constructon of mind maps provides another useful way of allowing learners to review, share and reflect upon what they have learnt.

Variety and fitness for purpose

The design of plenary sessions should reflect the purpose of the plenary. Whilst learners appreciate variety in the plenary session, it is also useful for them to get used to partcular structures that are used on a regular basis. Familiarity with the structure of a plenary design will lead to the short amount of tme available being used efficiently.

Problem-Based Learning

The goals of problem-based learning (PBL) are to develop higher order thinking skills by providing learners with authentc and complex problems and cases.

This approach to learning provides a more authentic context for learning and engages learners in authentic tasks. It is used frequently in fields such as engineering, medicine and architecture, and has been increasingly applied school settings. Through the process of working together, artculatinng theories, creatng hypotheses, and ccrically discussing the ideas of others, learners move to deeper levels of understanding of the problem. The self-directed learning strategies developed in PBL may help foster learners' lifelong learning.

Summary

1. Make the learning active-ask questions, set problems and organize projects.
2. Give feedback-explain how well each learners is doing and how his or her work could be improved.

3. Make your teaching clear-check that the learners can hear what you say and see what you write. Speak loudly, use simple language, write tidily, and use visual aids.
4. Make your teaching meaningful-explain how it will help learners to do their job beter.
5. Ensure mastery-check that all learners know the necessary tasks and can perform the necessary skills before and after each session.
6. Allow for individual differences-let learners learn at their own pace, leave enough free tme for individual study and use a variety of teaching methods.
7. Show that you care whether learners learn-set high standards and get to know each learners.

Teaching programming

Teaching programming means teaching the basic control structures of a language and the data structures it allows us to create for solving various problems. If teaching programming meant just explaining the syntax, the job would be easy, but also extremely boring for the learners. To instll the joy of programming in learners, you must demonstrate interesting cases of what happens when good practice are not adhered to .

Programming ability must rest on the foundaton of knowledge of computers, programming language and ICT as a whole. Here is a list of the most widespread methods in teaching programming:

- Methodical, algorithmic oriented.
- Data oriented.
- Specificaationoriented.
- Problem type-oriented.
- Language oriented.
- Instructon oriented.
- Mathematcs oriented.
- Hardware oriented.
- Model oriented.

You may prefer to use several methods at the same time ather than ssck to one single method.

Methodical, algorithmic oriented

This method covers the whole process of programming:

- Problem definnion and specificaion .
- Algorithm and data structure planning, comprehension of the correctness of the algorithm.
- Coding.
- Testng .
- Error detection, correc on.
- Efficiency control, quality control.
- Documentation.

Each activty is to be dealt with separately. The methods and tools connected with the topic should be considered in each case. Algorithm elaboration isconsidered to be of primary importance in thi s method, thus most of the emphasis is laid upon this during teaching. There are algorithmic oriented elements in later phases as well.

The basic idea of algorithm elaboration is ystemaac arrangement. The first step includes:

- General problem types and their general soluti n models, i.e. the programming formulae.
- Reduce the given problems to programming formulas, i.e. to determine how to apply certain programming theorems. The specialty of this method lies in the fact that it examines where and what needs to be actualized both in specificaationnd algorithm at the same tme.
- The programming formulae should be combined so that more formulas could be applied at the same time(not lineally, one afer the other). It is important to give the relevant (program transformation) rules not only for the specification but for the combination of all lorithms as well.

Data structure planning (a part of the subject traditionally called Data Structures and Algorithms) is to be processed here on the basis of the methodology of programming, i.e. data structure is a certain type with specificaaon, structure representaton and opperaton implementation .

A great number of decisions can be made during the coding phase depending on the definite or more general programming language. This method observes the vast majority of these decisions from algorithmic point of view. Thus the methods of conversion between interactive and recursive algorithms, the realizaton of the usual programming structures

(Branches, iterations, functons, operators, etc.) Are dealt with this way as well. Apart from this, the method discusses the tools of user-friendly programming (the realizaton of menu) in this phase. As regards the methods of testing, it handles the methods based on specification (known also as black box) and the ones based on algorithm (known as white box) as well.

In addition, the method of efficiency control is discussed with the help of algorithm as well.

This means that it defines general problem classes according to execution time,reservation, and complexity (similarly to programming theorems), it gives the algorithmic schemes and ideas for the enhancement of effectiveness (for example, the principle of sequence segmentation can be used for the algorithms of logarithmic search, quick sorting, parallel maximum and minimum choosing as well as for determining roots by ’bisecton method’)

Since the programming language does not play a primary role either in this or in the following two methods, it has litle influence on the structure of programming knowledge, thus learners instructed by this method will not be bound to one particular programming language.

Data-oriented

This method is similar to the previous one with the excepton that it regards data structure and type refinement as primary. Its basic principle is that problem identification regarded as type specification and it combines type refinement with algorithmic structures:

- Cartesian product – sequence.
- Union, alternative data structures – branching.
- Multitude (set, sequence, hierarchical and network structures) – iteration.
- Recursively defined sequence (data recursion or recursive type) – recursion.

In the clear variety of the method the connection with the user can be regarded as type refinement as well. We receive the input (forms) and output (reports) formats from this.

While the stress was laid upon programming theorems in the previous method, here data processing standard problems (data input, listing, listing with hierarchical totals, copying, up-datng, etc.) are put forward, which join input data structures and output data structures. It is possible to give general data structures and algorithms for these just like for programming theorems. This method emphasizes other problem types than the previous one. One characteristc of the algorithmic oriented method is that first it expands algorithmic structures that is its main principle is the principle of simple data structure complex algorithmic structure. As a contrast, data oriented concepton follows the principle of complex data structure simple algorithmic structure.

Specification oriented

This method considers formal specification to be the most significant part of the program development process, the algorithm is derived from the specification automaticaly, then the code is created with the help of rigid coding instructions. Similarly to the first method, there are programming theorems here as well, but the algorithms of these are derived from the given specification.

While it is the transformaton of the algorithm that is emphasized in the algorithmic oriented method, here more stress is laid upon the transformation of the specificacation. a result, data structure and algorithm subjects may contain more theoretical knowledge, may be based on theorems and on their proof necessary for efffective realisation Since each phase involves mathematical elaboration, it is advisable not to begin this method without profound theoretical knowledge and being able to understand that it requires abstraction skills.

Problem type-oriented

This method is fundamentally different from the previous three ones. Here programming is seen as a global activity, it cannot be divided into separate parts, and compared to the previous method, this one has got one essential feature, which is the fact that we always deal with the whole program. That is why it advances through each part one after the other while discovering new methods.

We start from a definite problem class here, which belongs to classical mathematics, usually with problems from number theory (divisibility, prime numbers, and prime factor expansion), but this method is most successfully applied (especially as regards primary and secondary educaton) in completely different fields:

- Graphics.
- Word processing.
- Common algorithms.

The essence of all of them is that a series of problems based on one another has to be solved. To solve the single problem we need new programming notions, elements and they are invented because they are needed for solving a specific problem. It has the advantage that new knowledge is derived from natural demand and not as an allegation. Besides, it is used to solve the problem at the same time and it is widely known that the highest level of understanding is the ability to use the newly acquired knowledge.

The method based on common algorithms is especially suitable for getting to know programm ing at an early age, since it is built upon our innate knowledge, and programming notions, methods are derived from it. It is important to note that algorithms have long been taught in kindergartens and primary schools only it did not have anything to do with teaching informatcs algorithmization.

It should be noted that this concept is applied to a number of methods of teaching programming.

Language oriented

This is one of the oldest methods, where the aim, just like in the previous case, is to produce an efffecve program . Another vital feature is that it is closely related to one particuar programming language as it is reflected in the following examples:

One can often hear conversatons like this: ’What are you studying in programming?’ - ’Pascal' In other words: There are ’Pascal’ programmers, ’C’-programmers, etc.

The basis of the method is that it teaches one particuar programming language and it introduces programming knowledge with the help of this language. Because the center of this method is the programming language itself, it contains a number of language dependent information, which might be remembered as general programming terms.

This is the reason why learners who learned one partcular programming language have difficulty changing over to another language. Another source of danger is that the complexity of a certain programming language element has hardly anything to do with the complexity of its applicaton in programming and when teaching with the emphasis on the language it is not highlighted appropriately. Excellent examples of this are branching and pretesting cconditi al iterarationstrucrucs which are of a bout the same complexity from linguisti point of view, however, we deal with problems that require iteration in the soluuon much more than with the ones that include branching only.

Furthermore, there are several programming conceptions, activities (stack, queue, sorting methods, etc.) that are not related to a certain programming language element thus they might be excluded from the process of teaching.

Instruction -oriented

This method is similar to language-oriented method with the exception that it is based on a general language type instead of one particular language. This is the most important difference between the two methods, which only means that the problems caused by the use of one special language are solved, the ones in connection with generalization still exist.

The method defines general language elements:

- Assignment, expressions.
- Reading, writing.
- Branching (IF-statement, Case-statement).
- Iterations (counting, conditional pre - and post-testing).
- Procedures.
- Functions, operators.
- Modules.

Apart from the difficulties of being bound to the language, there are all the disadvantages of the previous method as well, therefore this method might be considered unsuitable.

Mathematic oriented

This concept is founded on the concepts of another subject (which is mathematics in this example, but it could be another one as well). The problems to be solved are taken from mathematics, where the individual problems are based on each other in accordance with the principles of mathematics. Unfortunately, there is no guarantee that the structure will be either logical or complete from programming point of view.

Real temptation lies in mathemaacs itself with its ‘sovereign’ topics, special inner logic and proportions. There is no guarantee that these inner proportons can be synchronized with the real aim, which is programming.

Hardware oriented

This method assumes that algorithmic knowledge cannot be understood without high-level programming language knowledge; programming language knowledge cannot be understood without assembly or machine code knowledge, respectively; assembly knowledge cannot be understood without the understanding of how the processor works; etc.

Originating fom this appealing but incorrect reasonning, this methods tries to build up programming knowledge from the botom, claiming that: “To be able to understand the structure of assembly instructons and to execute an assembly program, one should know how processors work. Having acquired assembly language it is possible to understand how the instructions of high r-level languages work. With the knowledge of the instructions of higher-level languages it is easier to understand how certain algorithms work.”

As a consequence, this method states that there is no need for programming knowledge (in general: algorithmic and data modelling knowledge) except at university or college. This completely contradicts the fact that everyone needs to possess executve ability and algorithmic knowledge, as emphasized in public informatics.

Based on a model

In this method models are introduced to the learners (algorithms, program codes) and they get informaton about programming by studying them. They can produce new programs by modifying the existing ones. Experimenting lays a very important role here, pushing programming knowledge into the background. Learners modify the programs that they have been introduced evaluatng the received results and in case it meets their expectations the modification as been successful; if the result is not satisfactory, they have to continue experimenting.

Brief evaluation of themethods; the first two methods (algorithmic and data oriented) can be used towards the end of secondary educaton (for those preparing to work in informatcs business), in informatics professional training and in higher education. Regarding motivation, algorithmic oriented method is more valuable because a greater variety of more interestng problems can be used.

Specificaton oriented method is to be used for learners whose major is informatics as it can only be successful if the learners have profound mathematical knowledge. The only method that is advisable to be used in itself at all levels of public education (primary and secondary), where the aim is to develop algorithmic way of thinking and not professional training is problem oriented method.

Language and instruction oiented methods are considered to be out -of-date and their applicaton might cause too much danger while they might be less useful than others.

Mathematics oriented method is not thought to be effective in teaching programming but note that teaching mathematcs with the help of programming can be very useful for those possessing programming knowledge because the highest level of understanding mathemaitcs is the ability to apply it (e.g. in programming). Hardware oriented method (especially in its final form) can also be regarded out-of-date.

Aspects of programming

This analysis of the pedagogic value of programming identifies six important areas:

- Accuracy of expression.
- Understanding algorithms.
- Visual representaton of concepts and procedures .
- Analysis of situations.
- Data structures and applicaton of logic.

1. Accuracy of expression

Through computer programming you can insist upon and, importantly, demonstrate the need for accuracy and precision in what the learners do. However, this does not prevent creativit. Like a chess player has to obey the rules of the game, the imaginatve andd thoughtl implementatation of rules can create structures and procedures that are unique and valued. At the character level it is similar to spelling in the English curriculum -color and colour are significantly different.

To change the color of text to red use

```
<font color="#FF0000">
```

[HTML]

The accuracy at character level is more than just an Americanization of spelling; it is also “paying attention to detail” and realizing that spaces, punctuation marks and the case of leters are important. In manyareas, computer programming is case sensitive.

At the syntax level the learners become aware of the structures of instructions with operands and operators and the need to match each with the other in much the same way as there is an object-verb relationshp. For example,

```
FORWARD 10, WAIT 20, REPEAT 5, PRINT “hello world”.
```

Structures such as `IF THEN ELSE ENDIF` emphasize the importance of accuracy at a level higher than the individual character. In science, learners would be expected to know the symbols of reactants in an experiment and use the correct syntax when representing them, for example,

$$H_2SO_4 + 2NaHCO_3 \rightarrow Na_2SO_4 + 2H_2O + 2CO_2\uparrow$$

At the instruction level the learners have to be aware of structure in the same way as the grammar of an English sentence has rules of structure. All sentences begin with a capital leter and end with a full stop, exclamation or queston mark. They follow the rules of grammar and punctuation. Each sentence has a subject and a verb. In the same way, computer instructons have a precise structure with common rules called syntax. For example, in many languages the end of a line of code is indicated by a semi-colon.

```
if (aName == bName) {System.out.println('== the
same')};
```

In this unit, procedure or program level the concept of wholeness is introduced. The computer program is complete within itself and usable. When learners are asked in history to write about the reason for the rise of natonalism in the 1930s, they are expected to present their ideas as a sequence of connected statements that follow each other logically to build a sustained argument, frequently as a paragraph of text.

In the same way, learners develop the skills of coherent thought through sequencing the instructions, beginning by seeng the context, carrying out the operation and concluding in a formal manner. Writing a complete module, procedure or program is like writng a formal essay, poster, recipe or invitation. The product has a wholesomeness or completeness.

Practical examples,

The first is a simple program in BASIC to print out a “tmes table”,

```
10 A=7
20 M=12
30 FOR K = 1 TO M
40 P=K*A
50 PRINT A;” times “; K;” equals “; P
60 NEXT K
70 END
```

Lines 10 and 20 set the context; 30 to 60 carry out the repeated operaton to print 1 times 7 equals7, 2 times 7 equals 4, etc. and the final line formally ends the program releasing the computer to do other things.

The second example completes the same task in Pascal

```
a := 7;
m :=12;
for k := 1 to m do begin
p := p * a;
writeln(a, " tmes ", k, " equals ", p);
end;
```

2. Understanding algorithms

Algorithm can be considered a sequence of instructions, a finite set of commands or a method of working.

Algorithm can be considered synonymous with program but algorithm encompasses the whole domain of carrying out instructions in a predefined and accurate way. Algorithm is to computer program as writing is to story. It is not limited to programming. However, through computer programming, learners can gain a beter understanding of the value of predefined sequences of action to more efficiently and effectively achieve an outcome.

Two initial definations forlearners are:

An algorithm can be represented as a sequence of instructions to be carried out until an end point is reached;

Algorithms are the rules, conditons or sequence by which the computer or people tackle a problem or situation.

Other keywords to be used when discussing algorithm are: steps, instructions, commands, sequence, flow, decisions, branches, jumps, if then, conditonal, if then else, true false, repeaat, until, condon, iteraeon

Algorithm takes many forms. It can be the rules by which you drive a car. It can be the way in which you eat from a buffet. It can be the way in which you carry out a science procedure.

Example: You are approaching a traffic queue: which lane do you take? Always going to the shortest line is a 'greedy' algorithm. You might consider the shortest queue but always err to the right because you think that the fastest drivers are there. That algorithm is more strategic or refined. You may rely upon local knowledge of the road and queues and make different decisions in different places. The algorithm is very specialized and contains or makes reference to informaton. In a similar way, we program the computers to obey a set of predetermined rules -the algorithm.

3. Analysis of situations

The act of creating a computer program usually requires a deeper and more rigorous analysis of the context of the program than a learners might otherwise undertake, for example, the sequence of traffic lights or the input/output requirements of a heatng system or the data requirements of a video shop. The use of techniques such as systems analysis gives learners an insight into the ways in which precision can be obtained. The analysis of system diagrams help learners to understand how complex systems work. Those systems may be anything from biological population, mechanical devices, businesses, through to the impact of social policy and regulations. The synthesis of system diagrams for familiar situations helps the learners understand the detail and the complexity of systems –for instance, the school as a system. At the highest level (simplest) view of a system it is similar to a block diagram, showing its inputs, outputs and processes.

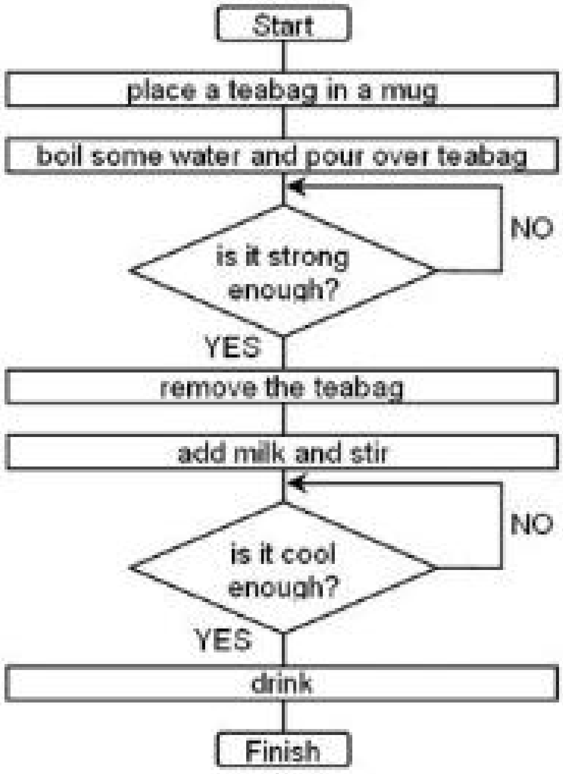
System diagrams and data flow are particularly helpful in showing how a change in one factor may impact elsewhere. Importantly, a good diagram might show how changing a factor may feedback to affect itself!

Drawing a system or data flow diagram is a good way of starting to build a computer model. The technique helps you to map out the structure of the system to be modelled. It shows the factors and relatonships that are important, and helps you to start quantifying the linkages between factors.

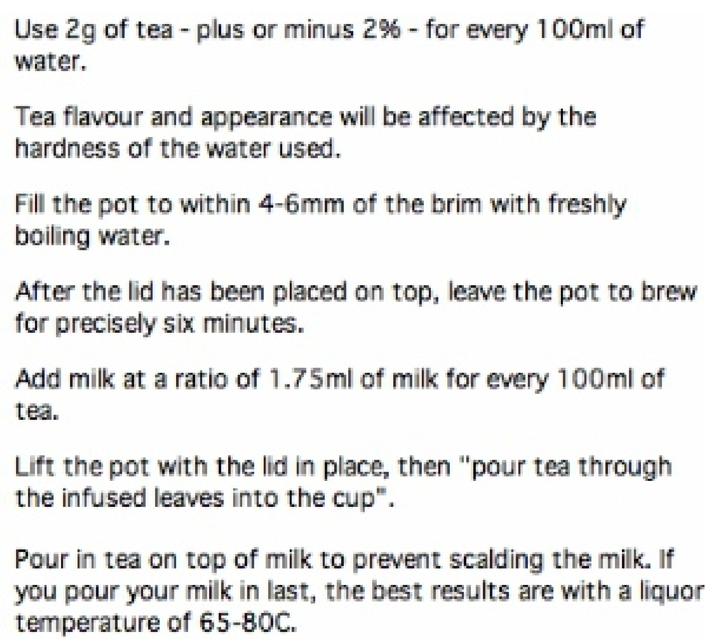
4. Visual representaton of concepts and procedures

The skills of visual representaton of learners' understanding are acknowledged in many areas of the curriculum. In English there is the story board, in mathematics is the chart, in science the symbolic representaton of atomic and subatomic partcles, in geography is the map at different levels of scale and symbolism and in humanites are the icons of religion, consumerism and politics. In computing there are visual representations of what the computer is doing when running a program: flow diagram, variables table and structured English instructions. Each aids the computer programmer but also, each is a tool that learners can apply in other areas of study to help them more efficiently and efffecvely represent their knowledge and understanding.

The following illustrates different representaaons of “making a cup of tea”



The structured English versions reflect the rigor and precision required when preparing to program a computer.



Use 2g of tea - plus or minus 2% - for every 100ml of water.

Tea flavour and appearance will be affected by the hardness of the water used.

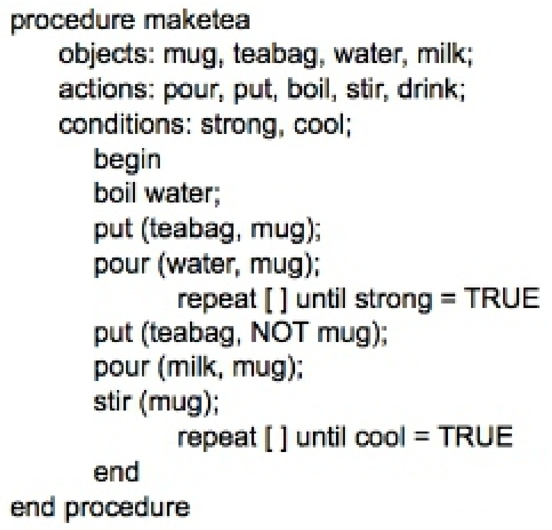
Fill the pot to within 4-6mm of the brim with freshly boiling water.

After the lid has been placed on top, leave the pot to brew for precisely six minutes.

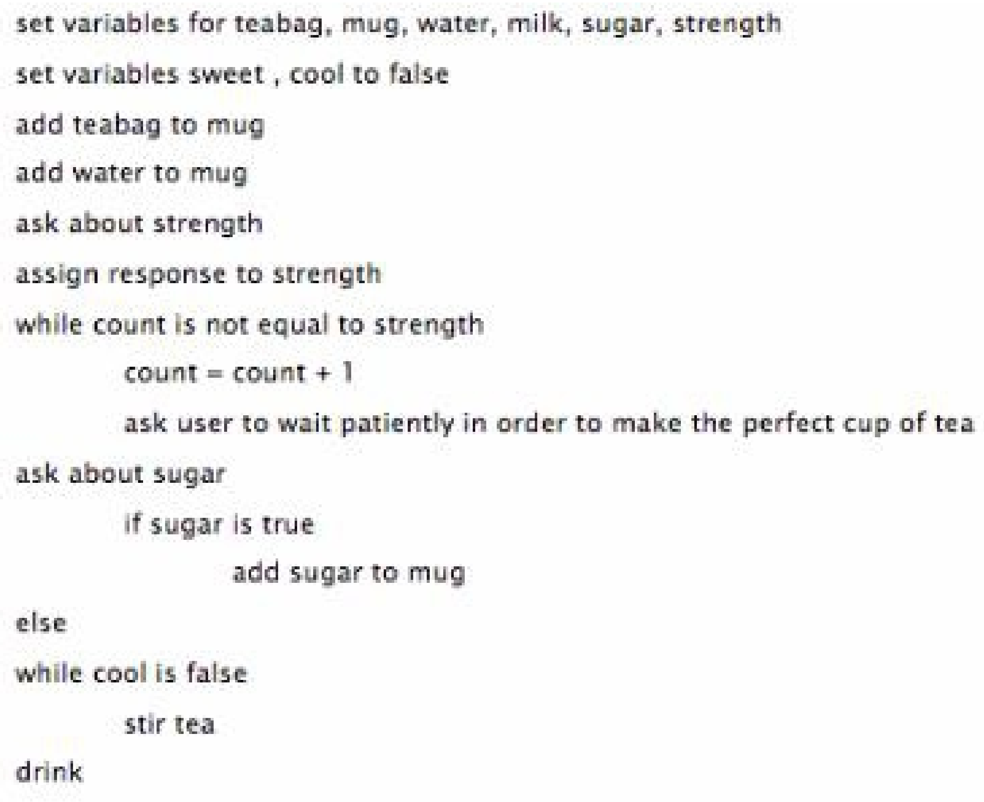
Add milk at a ratio of 1.75ml of milk for every 100ml of tea.

Lift the pot with the lid in place, then "pour tea through the infused leaves into the cup".

Pour in tea on top of milk to prevent scalding the milk. If you pour your milk in last, the best results are with a liquor temperature of 65-80C.



```
procedure maketea
    objects: mug, teabag, water, milk;
    actions: pour, put, boil, stir, drink;
    conditions: strong, cool;
        begin
        boil water;
        put (teabag, mug);
        pour (water, mug);
                repeat [ ] until strong = TRUE
        put (teabag, NOT mug);
        pour (milk, mug);
        stir (mug);
                repeat [ ] until cool = TRUE
        end
end procedure
```



```
set variables for teabag, mug, water, milk, sugar, strength
set variables sweet , cool to false
add teabag to mug
add water to mug
ask about strength
assign response to strength
while count is not equal to strength
          count = count + 1
          ask user to wait patiently in order to make the perfect cup of tea
ask about sugar
          if sugar is true
                    add sugar to mug
else
while cool is false
          stir tea
drink
```

5. Data structures

In computing, a data structure is a particular way of storing and organizing information so hat it can be accessed efficiently. Different kinds of data structures are suited to different kinds of applications and different types of data. Three examples that learners will be familiar with are: classification keys, indexes and labels. In science, classification keys in biology or chemicals are ofen based on a tree structure. Paper -based shopping catalogues use indexing and sequencing of the informaton. Car registraton number plates represent the systematic labelling of items. learners can learn to interpret (decode) a number plate and begin to understand the process of labelling for computerized systems such as the bar codes on goods for sale, the structure of URLs or the unique identifiers such as National Insurance numbers and the use of check digits.

Some data structures are specifically designed for efficient computer processing, for example, B-trees are partcularly well -suited for implementation of databases, while compiler implementations usually use hash tables to look up identfiers. Data structures are used in almost every program or sofware system. Specific data structures are esseneal ingredients of many efficient algorithms, and make possible the management of huge amounts of data, such as large databases and internet indexing services. Some formal design methods and programming languages emphasize data structures, rather than algorithms, as the key organizing factor in programming.

6. Applicaton of logic

Logic as a topic encompasses the understanding and applicaton of the Boolean algebra AND, OR, NOT truth values in keyword searching, electronic circuits, logic circuits and truth tables. This rigorous applicaton of rules again supports the need for accuracy of expression and clear thinking around novel concepts. Logic is the application of methods and criteria of validity of inference, reasoning and knowledge. The following are examples of the applicaton of logic.

Boolean logic is used in search engines to retrieve items on the web, for example, when searching in Google, if you enter words adjacent to each other, say WINE DINE, the interface automatically inserts an AND operator between the words and returns documents or items which contain both of these words, not necessarily adjacent to each other. The search for WINE OR DINE would give many more hits whereas the search for “WINE DINE” would give much fewer hits.

Visual basics

In this chapter you should give learners an idea of what a programming language is. And an idea of the work done to translate a high-level programing language into an executable program.

Computers require precise instructons in order to work. You should start by introducing the learners to a language they probably already know: English. Even with English, precise instructons are hard to create. Programming languages have evolved over the years. In the beginning everyone programed in machine language. This evolved through assembly language, higher level language, the C language, to the C++language. You should give a brief description ofeach of these stages. Next the learners are introduced to the tools used to create programs. At this point you can tell the learners the absolute minimum needed to actually use the tools and no more. But for now they need to know only how to use the editor, compiler, li nker, and the make utlity .

At this point it would be good to demonstrate creating a rogram . You can deliberately include a mistake. This creates a chance to show the learners what an error message looks like and how to correct it. When the chapter is finished the learners should be able to type in a program and get it to run. The program will not be understandable to the learners at this point, but it will be enough to get something to run.

You can define the following terms to the learners and later create an exercise to gauge the learners on their level of understanding.

Class Review guide

1. Define “Machine Language.” A language consisting of a series of numbers. These numbers represent the actual instructons used by the computer. 2.
2. Define “Assembly Language”. A language in which a single instruction translates directly into a single machine instructon.
3. Define “source code.” The high level code written by the programmer. In a high-level language, the source code is usually machine independent.
4. Define “object code.” The source code after it has been translated into machine language.
5. Define “library.” A collection of generally useful procedures available to the programmer.

6. Define “linker.” A program that combines one or more obj ect files with a set of libraries and produces an executable program.
7. Define “executable program.” A machine dependent file that contains all the instructions necessary to perform a task.
8. How is assembly language different from machine language? Machine language is solely numbers. Assembly language uses words to represent those numbers.
9. What does a compiler do? It takes a source file and transforms it into an object file. Note: many “compilers” are actually wrappers that run a compiler and a linker.
10. How is a compiler different from an assembler? One assembly instruction ranslates to one machine language instruction. Assembly language is a low-level language. A compiler translates one statement into many instructi ns. Compilers are also machine-independent, while assemblers are machine-dependent.
11. What is the extension for source files on a machine? The extension “.cpp” . Although .C and .cc are sometimes used on UNIX / Linux.
12. What type of program is used to create “source code?” A text editor. Note: many MicrosoftWindows compilers supply an Integrated Development Environment (IDE) that contains a text editor (among other things). In spite of all the wrapping, however, it is stll a text editor.
13. What is the extension for object files on our machine? DOS/Windows uses “.OBJ”. UNIX uses “.o” .
14. What type of programs are used to produce object files? Compilers.
15. What is the extension for the executable programs? DOS/Windows uses “.EXE”. UNIX uses no extension.
16. What type of files go into creating executable program? Programs start out as “source.” They get translated into “object” files by the compiler. These are combined with “libraries” by the linker into an “executable program.”
17. What type of program is used to create an executable program? The compiler starts the process, but it produces object files. The linker is the program that actually produces the executable programs. Note: the actual linking step may be hidden since the UNIX CC wrapper and the DOS Integrated Development Environments run the linker behind your back.

18. How do you access the on-line help system for your compiler? Most DOS/Windows Integrated Development Environments have a built-in help system. On UNIX you can use the “man” command.

Practi al guide

Example 1: Write a C Program to print “Hello, World”

```
#include <iostream.h<

//This program prints "Hello, World".

int main()

{

cout << "Hello, World.\n";

return 0;

}
```

Example 2: Write a C Program to print “Hello, World” with sequental output of several strings

```
#include <iostream.h<

//This program illustrates the sequentia ouput of several strings.

int main()

{

cout << "Hello, " << "Wor" << "ld.\n";

return 0;

}
```

Exampl 3 : Write a C Program to print “Hello, World” with sequental ouput of several strings

```
#include <iostream.h>

//This program illustrates the ouput of strings and characters:

int main()

{
```

```
cout << "Hello, " << 'W' << 'o' << "r" << "ld" << '.' << '\n';
return 0;
}
```

Exampl 4 : Write a C Program to test the the function strlen()

```
#include <iostream.h>
#include <string.h>
//This program tests the strlen() function:
int main()
{
cout << strlen("Hello, World.\n") << '\n';
cout << strlen("Hello, World.") << '\n';
cout << strlen("Hello, ") << '\n';
cout << strlen("H") << '\n';
cout << strlen("") << '\n';
return 0;
}
```

Example 5 : Write a C Program to demonstrate comments

```
#include <iostream.h>        // This directi  e is needed to use cout
//This prints message: "Hello, World:".
int main()
{
cout <<  /* now printing */ "Hello, World. \n";/* change?/*
return 0;// Some compilers will complain if you omit this line
*/{end of program/*}
```

Example 6 : Write a C Program to demonstrate assignment

```
<iostream.h>
//A simple example to illustrate assignment:
```

```
int main()
{
int n;
n = 66;
cout << n << endl;
return 0;
}
```

Example 7 : Write a C Program to demonstrate variable declarati ns

```
#include <iostream.h>
//This program illustrates variable declaratons :
int main()
{
int x, y1;// declares the variables x and y1
x = 77;
y1 = 88;
int y2 = 55;// declares the variable y2, inital izing it to 55
cout << x << ", " << y1 << ", " << y2 << endl;
return 0;
}
```

Example 8: Write a C Program to illustrate tokens

```
#include <iostream.h<
//A simple program to illustrate tokens :
int main()
{
int n = 66;
cout << n << endl;
return 0;
}
```

Example 8: Write a C Program to initalize variable as they are declared

```
#include <iostream.h>
//This shows how to initaliz e variable as they are declared:
int main()
{
int num1 = 44;
int num2 = 33;
int sum = num1 + num2;
cout << george << " + " << martha << " = " << sum << endl;
return 0;
}
```

Example 9: Write a C Program to initalize variab le as they are declared

```
//This shows how to initalize variables as they are declared:
int main()
{
int n1, n2 = 55, n3, n4, n5 = 44, n6;
cout << n2 << ", " << n5 << endl;
return 0;
}
```

Example 9: Write a C Program to demonstrate assignment.

```
#include <iostream.h>
//This shows that an assignment can be part of a larger expression:
int main()
{
int m, n;
m = (n = 66) + 9;// (n = 66) is an assignment expression
cout << m  << ", " << n << endl;
return 0;
}
```

Example 10: Write a C Program to test arithmetc operators .

```
#include <iostream.h>
//Tests arithmetic oper  tors :
int main()
{
int m = 38, n = 5;
cout << m << " + " << n << " = " << (m + n) << endl;
cout << m << " -" << n << " = " << (m -n) << endl;
cout <<      "  -" << n << " =" << (-n)    << endl;
cout << m << " * " << n << " = " << (m * n) << endl;
cout << m << " / " << n << " = " << (m / n) << endl;
cout << m << " % " << n << " = " << (m % n) << endl;
return 0;
}
```

Example 11: Write a C Program to test quotient   nd remainder operators.

```
#include <iostream.h>
//Tests q uotient an   remainder operators:
int main()
{
int m = -14, n = 5, q = m/n, r = m%n;
cout << "m = " << m << endl;
cout << "n = " << n << endl;
cout << "q = " << q << endl;
cout << "r = " << r <<endl;
cout << "q*n + r = " << "(" << q << ")*(" << n"+(">>

>>r << " = " << q*n + r << " = " << m << endl;

return 0;

}
```

Example 12: Write a C Program to test the increment and decrement. operators

```
#include <iostream.h>

//Tests the increment and decrement operators:

int main()

{

int m = 44, n = 66;

cout << "m = " << m << ", n = " << n << endl;

++m;

--n;

cout << "m = " << m << ", n = " << n << endl;

m++;

n--;

cout << "m = " << m << ", n = " << n << endl;

return 0;

}
```

Example 13: Write a C Program to test the increment and decrement. operators

```
#include <iostream.h>

//Tests the increment and decrement operators:

int main()

{

int m = 66, n;
n = ++m;

cout << "m = " << m << ", n = " << n << endl;

n = m++;

cout << "m = " <<  m  << ", n = "  << n  << endl;

cout << "m = " << m++ << endl;

cout << "m = " <<  m  << endl;

cout << "m = " << ++m << endl;

return 0;

}
```

Example 13: Write a C Program to test the increment and decrement. operators

```
#include <iostream.h>

int main(){int n = 5, x;

x = ++n * --n;

cout << "n = " << n << ", x = " << x << endl;

{int n1, n2, n3;

cout << "Enter three integers":;

cin >> n1 >> n2 >> n3;

int max = n1;

if (n2 > max) max = n2;

if (n3 > max) max = n3;

cout << "The maximum is " << max << endl;

return 0;

}
```

Example13: Write a C Program to test output of type char .

```
#include <iostream.h>

//Tests output of type char:
```

```
int main()

{

char c = 64;

cout << c++ << " "; // prints '@' and increments c to 65

cout << c++ << " "; // prints 'A' and increments c to 66

cout << c++ << " "; // prints 'B' and increments c to 67

cout <<c++ << endl; // prints 'C' and increments c to 68

c = 96;

cout << c++ << " "; // prints '`' and increments c to 97

cout << c++ << " "; // prints 'a' and increments c to 98

cout << c++ << " "; // prints 'b' and increments c to 99

cout << c++ << endl; // prints 'c' and increments c to 100

return 0;

}
```

Example 13: Write a C Program to Print sum, difference, product, and quotent of given integers:

```
#include <iostream.h>

//Prints sum, difference, product, and quotie t of given integers:

int main()

{int m = 60, n = 7;

cout << "The integers are " << m << " and " << n << endl;

cout << "Their sum is       " << (m + n) << endl;

cout << "Their difference is " << (m -n) << endl;

cout << "Their product is    " << (m * n) << endl;

cout << "Their quotent is   " << (m / n) << endl;

cout << "Their remainder is  " << (m % n) << endl;

return 0;
}
```

Example 13: Write a C Program to print the block leter "B" in a 7 x 6 grid

```
#include <iostream.h>
//Prints the block leter "B" in a 7 x 6 grid:
int main()
{
cout << "*****" << endl;
cout << "*    *" << endl;
cout << "*    *" << endl;
cout << "*****" << endl;
cout << "*    *" << endl;
cout << "*    *" << endl;
cout << "*****" << endl;
return 0;
}
```

Example 13: Write a C Program to print the block leter "B" in a 7 x 6 grid

```
#include <iostream.h>
int main()
{
int score;
cout << "Enter the test score":;
cin >> score;
if (score > 100) cout << "Error: score is out of range".;
else if (score >= 90) cout << 'A';
else if (score >= 80) cout << 'B';
else if (score >= 70) cout << 'C';
else if (score >= 60) cout << 'D';
else if (score >=  0) cout << 'F';
else cout << "Error: score is out of range".;
return 0;
}
```

Example: Write a C Program to Solve solves quadratic equation

```
#//include <iostream.h>
int main()
{
int i = 1, n, sum = 0;
cout << "Enter a positve integer: ";cin >> n;
while (i <= n){
sum += i*i;
i++;
}
cout << "The sum of the first " << n << " squares is"
<<sum << endl;
return 0;
}
int #include <iostream.h<
main()
{
int n, f = 1;
cout << "Enter a positve integer: ";
cin >> n;
cout << n << " factorial is “;
do {
```

```
f *= n;
n--;
while (n > 1);
{
cout << f << endl;
return 0;
}
```

Example to calculate factorial functon

```
#include <iostream.h>
int main()
{
int n, f = 1;
cout << "Enter a positi  e integer: ";cin >> n;
for (int i = 2;i <= n; i++)
f *= i;
cout << n << " factorial is " << f << endl;
return 0;
}
```

Example   : Write a C Program to make calendar

```
#include <iostream.h>
void printDate(int, int, int);
int main()
{
int month, day, year;
do
{
cin >> month >> day >> year;
printDate(month,day,year);
}while (month > 0);
return 0;
}
void printDate(int m, int d, int y)
{
if (m < 1 | | m > 12 | | d < 1 | | d > 31 | | y < 0){
cout << "Error: parameter out of range.\n”;
return;
}
switch (m) {case  1:  cout << "January ";break;
case  2:  cout << "February ";break;
case  3:  cout << "March ";break;
case  4:  cout << "April ";break;
case  5:  cout << "May ";break;
case  6:  cout << "June ";break;
case  7:  cout << "July ";break;
case  8:  cout << "August ";break;
case  9:  cout << "September ";break;
case 10:  cout << "October ";break;
case 11:  cout << "November ";break;
case 12:  cout << "December ";break;
}
cout << d << ", " << y << endl;
}
```

Example : Write a C Program to get the area of circle .

```
#include <iostream.h>
void computeCircle(double&, double&, double);
int main()
{
double r, a, c;
cout << "Enter radius":;
cin >> r;
computeCircle(a, c, r);
cout << "area = " << a << ", circumference = " << c << endl;
return 0;
}
```

Practcal Answer

1. Write a C program that accepts an employee's ID, total worked hours of a month and the amount he received per hour. Print the employee's ID and salary (with two decimal places) of a partcular month.

```
#include <stdio.h>

int main() {

        char id[10];

        int hour;

        double value, salary;

        print("Input the Employees ID(Max. 10 chars): ");

        scanf("%s", &id);

        print(" \nInput the working hrs: ");

        scanf("%d", &hour);

        print(" \nSalary amount/hr: ");

        scanf("%lf", &value);

        salary = value * hour;

        print(" \nEmployees ID = %s\nSalary = U$ %.2lf\n", id,salary);

        return 0;

}
```

2. Write a C program to calculate a bike’s average consumpton from the given total distance (integer value) traveled (in km) and spent fuel (in liters, float number – 2 decimal point).

```
#include <stdio.h>

int main()

{

        int x;

        float y;
        print("Input total distance in km: ");

        scanf("%d",&x);

        print("Input total fuel spent in liters: ");

        scanf("%f", &y);

        print("Average consumpptn (km/lt) %.3f ",x/y);

        print(" \n");

        return 0;

}
```

3. Write a C program to calculate the distance between the two points. Note: x1, y1, x2, y2 are all double values.

Formula:

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

```
#include <stdio.h>

#include <math.h>


int main() {

        float x1, y1, x2, y2, gdistance;

        print("Input x1: ");

        scanf("%f", &x1);

        print("Input y1: ");

        scanf("%f", &y1);

         printf(Input x2: ");

        scanf("%f", &x2);

        print("Input y2: ");

        scanf("%f", &y2);

        gdistance = ((x2-x1)*(x2-x1))+((y2-y1)*(y2-y1));
        print("Distance between the said points: %.4f", sqrt(gdistance));
        print(" \n");
        return 0;
}
```

4. Write a C program to read an amount (integer value) and break the amount into smallest possible number of bank notes.

Note: The possible banknotes are 100, 50, 20, 10, 5, 2 and 1.

```
#include <stdio.h>
int main() {
        int amt, total;
        print("Input the  amount: ");
        scanf("%d",&amt);

        total = (int)amt/100;

        print("There are: ");

        print(" \n%d Note(s) of 100.00\n", total);

        amt = amt-(total*100);

        total = (int)amt/50;

        print("%d Note(s) of 50.00 \n", total);

        amt = amt-(total*50);
```

```
total = (int)amt/20;
print("%d Note(s) of 20.00 \n", total);
amt = amt-(total*20);
total = (int)amt/10;
print("%d Note(s) of 10.00 \n", total);
amt = amt-(total*10);
total = (int)amt/5;
print("%d Note(s) of 5.00 \n", total);
amt = amt-(total*5);
total = (int)amt/2;
print("%d Note(s) of 2.00 \n", total);
amt = amt-(total*2);
total = (int)amt/1;
print("%d Note(s) of 1.00 \n", total);
```

```
	return 0;

}
```

5. Write a C program to convert a given integer (in seconds) to hours, minutes and seconds.

```
#include <stdio.h>

int main() {

	int sec, h, m, s;

	print("Input seconds: ");

	scanf("%d", &sec);


	h = (sec/3600);


	m = (sec -(3600*h))/60;


	s = (sec -(3600*h)-(m*60));


	print("H:M:S  - %d:%d:%d\n",h,m,s);


	return 0;

}
```

6. Write a C program that reads an integer between 1 and 12 and print the month of the year in English.

```
#include <stdio.h>


int main() {

	int mno;
```

```
    print(" \nInput a number between 1 to 12 to get the month name: ");
    scanf("%d", &mno);
    switch(mno) {
        case 1 : printf("January\n"); break;
        case 2 : printf(February  \n"); break;
        case 3 : printf(March  \n"); break;
        case 4 : printf(April  \n"); break;
        case 5 : printf(May  \n"); break;
        case 6 : printf(June  \n"); break;
        case 7 : printf(July  \n"); break;
        case 8 : printf(August  \n"); break;
        case 9 : printf(September  \n"); break;
        case 10 : print("October \n"); break;
        case 11 : print("November \n"); break;
        case 12 : print("December \n"); break;
        default : print("Input a number between 1 to 12.");
    }
    return 0;
}
```

7. Write a C program to read a password untilit is correct. For wrong password print "Incorrect password" and for correct password print "Correct password" and quit the program. The correct password is 1234.

```
#include <stdio.h>
int main() {
    int pass, x=10;
    while (x!=0)

    {

    print(" \nInput the password: ");

    scanf("%d",&pass);


    if (pass==1234)

    {

        print("Correct password");

        x=0;

 }

 else

 {

  printf(Wrong password, try another");

    }

    print(" \n");

 }

    return 0;

}
```

8. Write a C program to print 3 numbers in a line, startng from 1 and print n lines. Accept number of lines (n, integer) from the user.

```
#include <stdio.h>

int main() {

    int a, i, j = 1, x = 0;

    print("Input number of lines: ");

    scanf("%d", &a);

    for(i = 1; i <= a; i++) {

        while(x < 3) {
```

```
                        print("%d ", j++);

                        x++;

                }

                x = 0;

                print(" \n");

        }


        return 0;

}
```

9. Write a C program to read an array of length 6 and find the smallest element and its positon.

```
#include <stdio.h>

int main() {

        int e, i, sval, position;


        print(" \nInput the length of the array: ");

        scanf("%d", &e);


        int v[e];

  printf("\nInput the array elements:\n ");

        for(i = 0; i < e; i++) {

                        scanf("%d", &v[i]);

        }

        sval = v[0];

        positon = 0;

        for(i = 0; i < e; i++) {

                if(sval > v[i]) {
```

```
            sval = v[i];

            positon = i;

        }

    }


    print("Smallest Value: %d  \n", sval);

    print("Posiition of t      element: %d\n", position);

    return 0;

}
```

10. Write a C program to read the coordinate(x, y) (in Cartesian system) and find the quadrant to which it belongs (Quadrant -I, Quadrant -II, Quadrant -III, Quadrant -IV). Note: A Cartesian coordinate system is a coordinate system that specifies each point uniquely in a plane by a pair of numerical coordinates. These are ofen numbered from 1st to 4th and denoted by Roman numerals: I (where the signs of the (x,y) coordinates are I(+,+), II (−,+), III (−,−), and IV (+,−).

```
#include <stdio.h>

int main()

{

    int x, y;

 printf(Input the Coordinate(x,y): ");

    print(" \nx: ");

 scanf("%d", &x);

 printf(y: ");

 scanf("%d", &y);


        if(x > 0 && y > 0)

        {
            print("Quadrant  -I(+,+)\n");
        }
        else if(x> 0 && y < 0)
        {
            print("Quadrant  -II(+,-)\n");
        }
        else if(x < 0 && y < 0)
        {
                print("Quadrant  -III(-,-)\n");
        }
        else if(x < 0 && y > 0)
        {
            print("Quadrant  -IV(-,+)\n");
        }
    return 0;
}
```

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