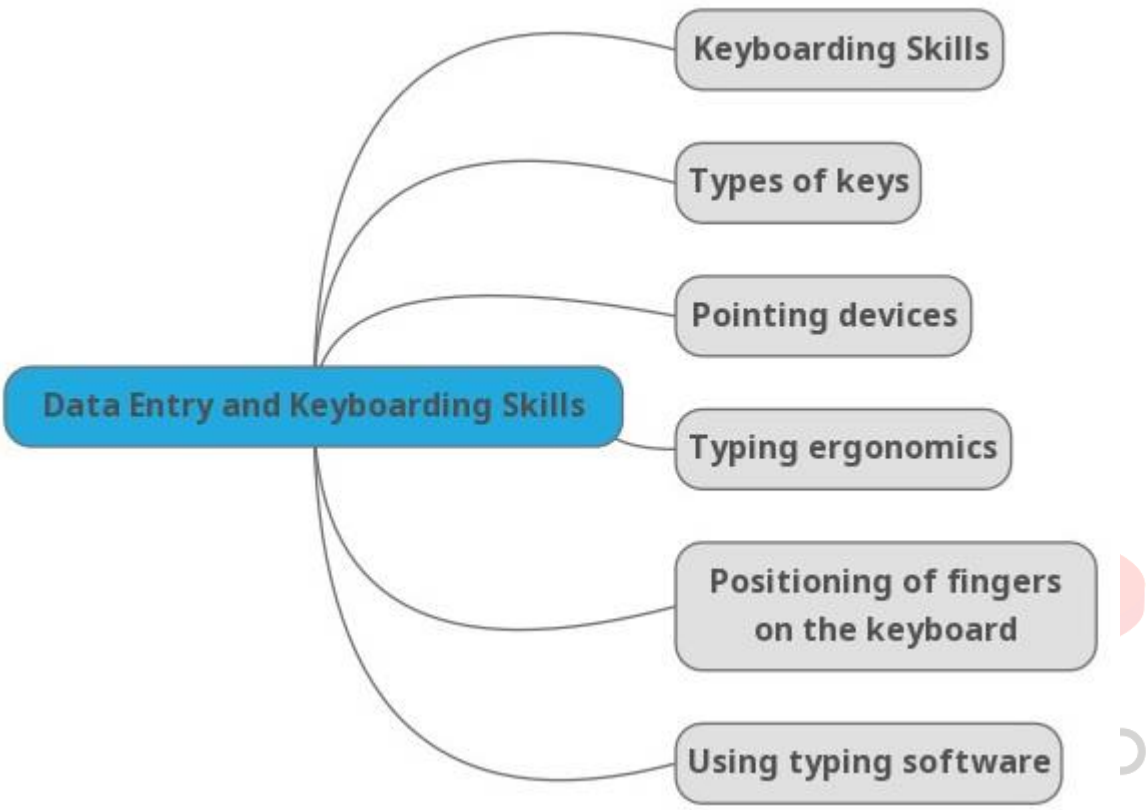
(PART B)CHAPTER-02
Data Entry and Keyboarding Skills

Memory Map



Session 1:

Introduction:

- In order to enhance operational skills in the use of computers, knowledge of efficient and effective keyboarding skills and typing ergonomics has become inevitable today.
- With consistent, sincere efforts and controlled environment, we can master keyboarding skills and acquire high speed. Keying data into the computer quickly and accurately, thus, becomes easy.
- There are various methods of typewriting. In this unit, we will study about various types of keys, typing ergonomics and positioning of fingers on the keyboard according to touch method of typewriting and use of typing software for learning keyboarding skills.

Keyboarding Skills

- Keyboard is the most common text-based input device.

- A keyboard generally has more than 100 keys. Each key of a keyboard corresponds to a single symbol. Some symbols require pressing and holding several keys simultaneously or in sequence. It allows entering alphabets, digits and symbols into the computer. Simultaneous key press can produce actions or computer commands.
- The touch method of typewriting is a method of typing without using the sense of sight to find the keys. There is no need to search the key while typing and one has to move only the finger which is needed to strike a key.
- Touch typing typically involves placing the eight fingers in a horizontal row along the middle of the keyboard (the home row). Touch typing can be done with two hands or by using a single hand also.
- A touch typist starts by placing his or her fingers on the "start position" in the middle row and knows which finger to move and how much to move it for reaching any required key.
- It is important to learn placing fingers into the start position blindly as the hands are frequently raised from the keyboard to operate the line feed lever (in the past) or (more recently) the computer mouse.
- Typing speed generally improves with practice. The typing speed can be increased gradually and speeds of 60 WPM (words per minute) or higher can be achieved. The rate of speed increase varies between individuals. Many websites and software products (e.g., Rapid Typing Tutor) are available to learn touch typing and many of these are free. There are many such software available which are free of cost and are customised to learn typing efficiently and effectively.

Types of keys

A computer keyboard contains the following types of keys:

- **Alphanumeric keys**: All of the alphabet (A-Z) and numbers (0-9) on the keyboard.
- **Punctuation keys**: All of the keys associated with punctuation, such as the comma (,), period (.), semicolon (;), brackets ([]), and parenthesis ({ }) and so on. Also, all of the mathematical operators such as the plus sign (+), minus sign (-), and equal sign (=).
- **Alt key**: Short for Alternate, this key is like a second control key.
- **Arrow keys**: There are four arrow keys to move the cursor (or insertion point) up (↑), down (↓), right (→), or left (←). Arrow keys can be used in conjunction with the
- **Shift or Alt keys**: To move the cursor in more than one position at a time.
- **Backspace key**: Deletes the character just to the left of the cursor (or insertion point) and moves the cursor to that position.
- **Caps Lock key:** It is a toggle key, which when activated, causes all alphabetic characters to be uppercase.
- **Ctrl key**: The control key is used in conjunction with other keys to produce control characters. The meaning of each control character depends on which program is running.
- **Delete key:** The Del key deletes the character at the current cursor position, or the selected object, but does not move the cursor. For graphics-based applications, the delete key deletes the character to the right of the insertion point.
- **Enter key or Return key**: It is used to enter commands or to move the cursor to the beginning of the next line.

- **Esc key**: The Escape key is used to send special codes to devices and to exit (or escape) from programs and tasks.
- **Function keys**: Special keys labelled F1 to F12. These keys have different meaning depending on which program is running.

When a key is pressed, an electrical contact is formed. These electric signals are transmitted to a micro-controller in a coded form to the computer describing the character which corresponds to that key.

Numeric keypad

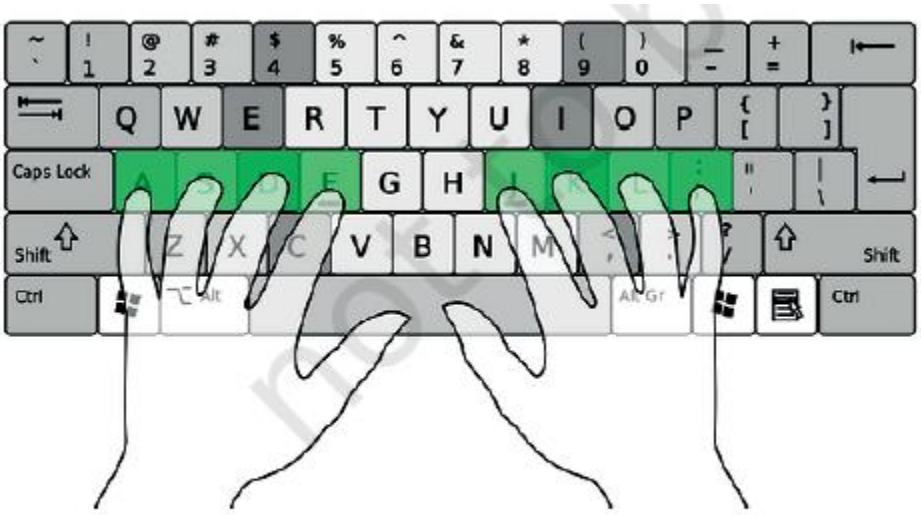
Numeric keypad (Figure. 2.1) is used when enormous numeric data is to be entered. This keypad is just like a simple calculator. It is normally located on the right-hand side of computer keyboard. It contains numbers 0 to 9, addition (+), subtraction (–), multiplication (*) and division (/) symbols, a decimal point (.) and Num Lock and Enter keys. Numeric keypad may also work on dual mode. On one mode, it represents numbers and on the other mode, it contains various keys like arrow keys, page up, page down, etc. NumLock is provided to switch between the two modes. Usually, some of the keyboards of laptops do not have a numeric keypad.

Fig. 2.1: Numeric keys

Home Keys

Alphabets ASDF are home keys for the left hand and; (semi-colon) LKJ for the right hand. The fingers are trained to make the correct movement to other keys and each finger returns immediately to its respective home key after it has depressed the corresponding key in any other row.

Guide keys



On a computer keyboard, keys 'F' and 'J' are called guide keys for left and right hand, respectively. Both contain a small raised tangible mark with the help of which the touch typist can place the fingers correctly on the home keys.

Fig. 2.2: Position on Home Row

Typing and deleting text

For typing text in a document you should

- click on the letters on the keyboard.

For deleting text in a document you should

- use the backspace key or the delete key. The backspace key will remove text from behind (to the left of) your cursor position.

For typing numbers in a document you should

- use the numbers lock or the numbers on the second row of keys on the keyboard.

Typing capital letters

To type capital letters, switch ON the Caps Lock by pressing the key before typing. A light will shine on the top right side corner of the keyboard that shows Caps lock is on. To switch it off, tap on the Caps lock key before typing.

Typing symbols

Press and hold the key and then press the key with the required symbol. There are two Shift keys on the keyboard — to the bottom left and right of the letters. The Shift key is used to access the top symbols that are one of the keys with two characters.

Typing sentences

To get space between typed words, press the space bar once and then type the next word.

Creating new lines and spaces between paragraphs

The Enter or return key is used to create new lines and spaces between paragraphs. Make sure that the cursor is flashing from a new line. It is also used to authorise instructions asked for the computer to perform.

Guide for typing

The cursor keys serve as a guide for typing. They can be used to move the position of the cursor. The cursor is the small downward line that flickers in a sentence while typing. Move the position of the cursor by clicking the position with a mouse.

Pointing devices

A pointing device, or sometimes called a pointing tool, is a hardware input device that allows the user to move the mouse cursor in a computer program or GUI operating system. Using a pointing device, you can point at or manipulate any object or text on the screen. For example, using a pointing device you could point at and select an icon from a list of icons.

Examples of pointing devices: mouse, joystick, light pea, touch pad or track ball and touch screen.

Mouse

- Mouse is a pointing device used to point a particular place on the screen and select to perform one or more actions (Figure 2.3). It can be used to select menu commands, resize windows, selecting actions from screen icons, etc.
- A mouse primarily comprises of three parts: the buttons, the handling area, and the rolling object. By default, the mouse is configured to work for the right hand. The left-handed persons can change the settings as per the needs.

- Put the right hand on the mouse, the index finger goes on the left button, and the middle finger goes on the right button (Figure 2.4 [a & b]). Hold the mouse with thumb and ring

finger. To click, press a mouse button lightly and release it immediately.

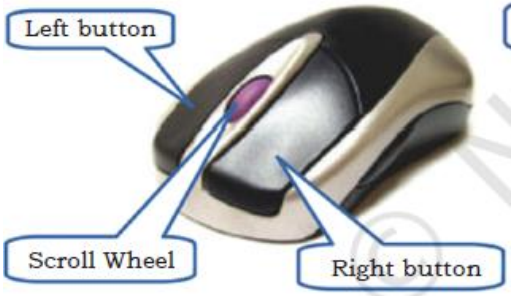


Fig. 2.3: Mouse buttons

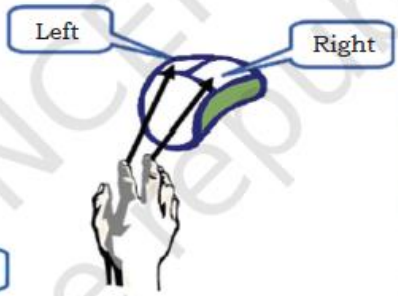


Fig. 2.4 (a) How to hold the mouse

Fig. 2.4 (b) Position of fingers while holding the mouse

Mouse pointer

The mouse pointer allows to point on the screen. The pointer changes as shown below.

This mouse pointer will appear as you move it around the screen (it can also be used to move things).

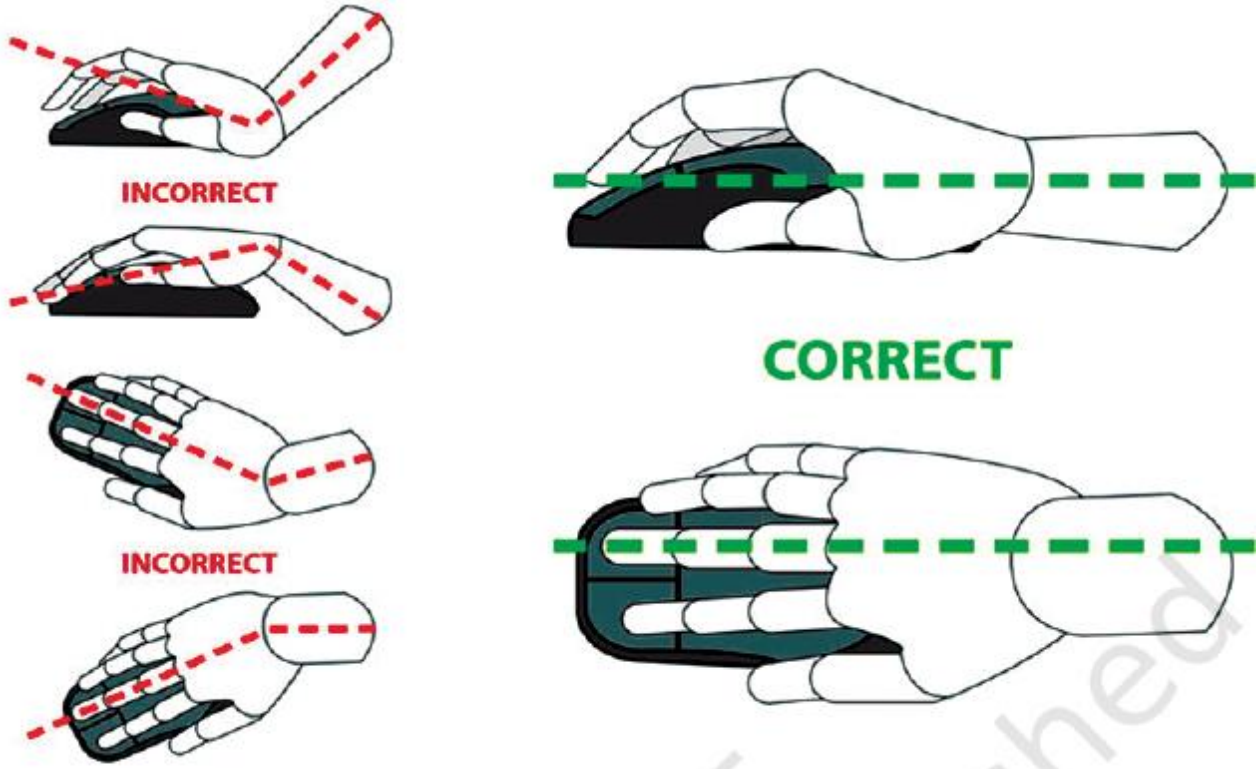


Fig. 2.4: Correct and incorrect positioning of fingers on the mouse

It will appear as you move it around the screen.

This mouse pointer will also appear as you move it around the screen, particularly if it is over text. (This shape can be seen when you are about to type text.).

- While working on a web browser, the pointer change to a pointing finger symbol as moved it over the page. This identifies a hyperlink. Click the left mouse button once to follow the hyperlink to another page.

Mouse operations

All mouse do not use the same mechanical operation but all of them accomplish the same task. Some of them use a tracking ball at the bottom and some of them use a type of light beam to detect the motion of mouse. Laptops are equipped with a small flat surface or sometimes with a very short stick for performing same job as mouse. The most conventional kind of mouse has two or three buttons on its top. These buttons are used for different actions. Using left button of mouse different operations like selection, dragging, moving and pasting can be done. With the right button we can open a context menu for an item, if it is applicable.

The common mouse actions are as follows:

a) **Click or left click:** It is used to select an item. Press down once on the left button with your index finger.
b) **Double click:** It is used to start a program or open a file or trigger an action.
c) **Right click:** It is used to display a set of commands and available options. Move the mouse pointer to the desired position, position your middle finger on the right mouse button, keeping the mouse still, click lightly with the middle finger on the right button.
d) **Drag and drop:** It allows to select and move an item from one location to another. Position the mouse on an object, hold down the left side of the mouse, and drag the object.
e) **Scroll:** Many applications provide scrollbars on right side of screen if the page length is more than the monitor/screen length. Instead of using page down key or arrow keys, one can use scroll key of a mouse to scroll up or down. If the scroll key is not available, one can click on the scroll bar on the application screen with the let button of the mouse. Use the scroll wheel on the mouse to move the page on the screen up or down.
f) **Blocking:** Blocking is another way of selecting text. It is used to select text that needs to be edited or formatted. Click at the beginning of the word or sentence and hold down the left button, then drag along the text and see it being highlighted in black. At the end of the text or sentence release the left button.

Typing ergonomics

Typing ergonomics provides the logistic support for efficient and effective typewriting. They are important to attain and maintain accuracy and speed. Some of these factors included are as given as below.

- ***Sitting posture***

While operating the computer keyboard, sit straight, slightly bending your neck forward. Check your comfort and sitting position of body. Touch the lower portion of your back to the lower portion of the back rest of the chair. Touch both the feet to the floor (Figure 2.5).

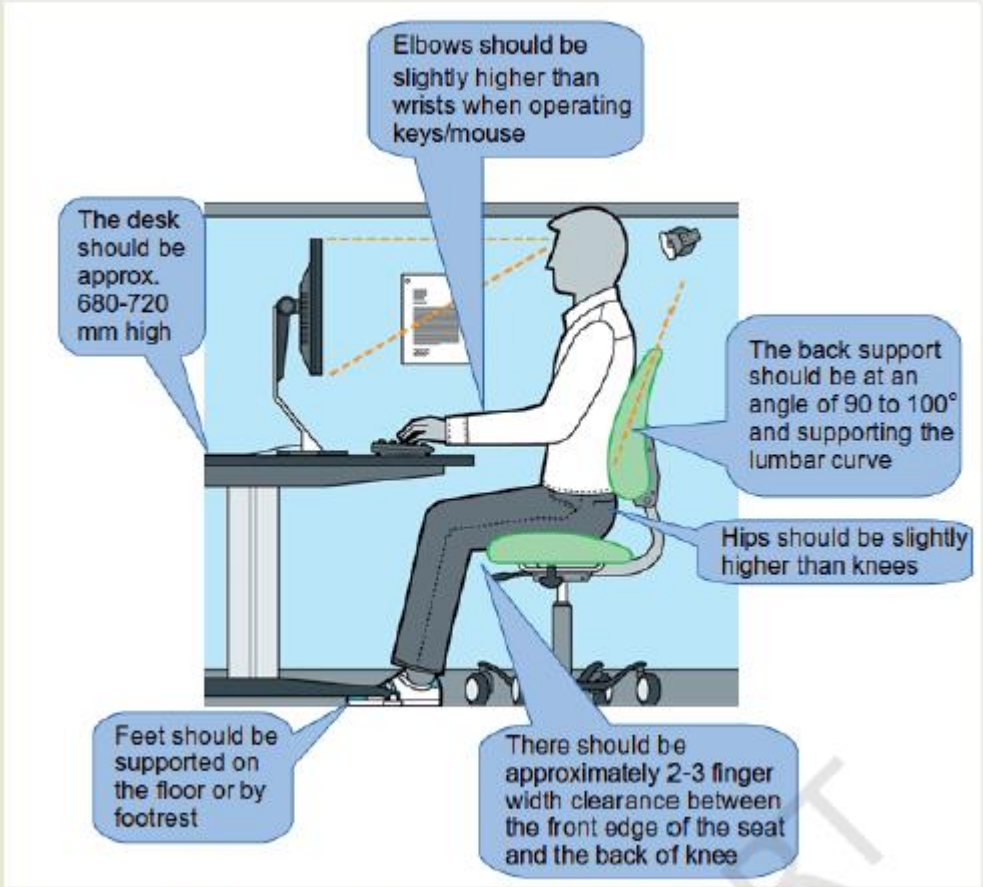


Fig. 2.5: Sitting posture while working on computer

- ***Position of hands***

Put your forearms at level with the keyboard and palms down (Figure 2.6). Keep your wrists straight and hang your elbows naturally. Don't touch the elbows to the body nor be too far away from the body (Figure 2.7). Bend at about a 90 degree angle.

Fig. 2.6 Correct screen angle view

Fig. 2.7 Wrong way of sitting

- ***Monitor placement***

Do not bend your neck while working on the monitor and keep the upper border of screen at eye level. The distance of screen from the user depends on the size of the screen. Keep an approximate distance of about 60–65 cms for 17 inches screen.

- ***Mouse and keyboard placement***

Keep the keyboard and mouse together at an approximate distance of 20 cms, which will help in smooth and effortless operation of keyboard. Same height of keyboard, mouse and elbows helps the users to work comfortably.

- ***Chair and table placement***

Adjust computer chair and table to an optimal height. The chair of the computer user must be supportive to his/her lower back. Keyboard and vibrating devices, such as printers, should be on separate tables. The computer table should also have sufficient space for your legs. With the correct ergonomics, typewriting becomes a natural phenomenon without causing unnecessary fatigue.

- ***Placement of matter to be typed***

Place the matter for typing to the left or right side of the keyboard preferably on a Copy Holder which has a sloping surface.

Positioning of fingers on the keyboard

As typing is equivalent to pen or pencil now-a-days, mastery of computer keyboard has become obvious. Mastery typewriting skills means to attain necessary knowledge and skill of keyboard operation by correct positioning of fingers.

In the Home Row Approach, also called Horizontal Approach, all the eight fingers of both the hands rest on Home Keys during the keyboard operation. The fingers are trained to make the correct movement to the other keys in such a way that each finger returns immediately to its home key after it has depressed the corresponding key in any other row. The thumb of the right hand is used to operate the Space Bar.

- ***Allocation of keys to fingers***

Fig. 2.8: Allocation of keys to fingers

The keyboard learning process starts from the second row (Home Row) followed by the Third Row (Upper Row), First Row (Bottom Row) and the Fourth Row (Number Row). The fingers of both the hands have to operate the keys allotted to them on each row (Figure 2.8). It must be remembered that each finger has to operate only the key allotted to it.

- ***Allocation of keys to fingers on the second row (home row)***

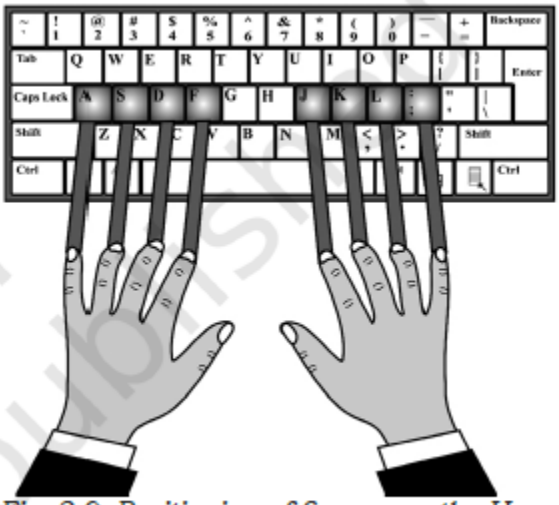


Fig. 2.9: Positioning of fingers on the Home row

Place four fingers of each hand on Home Keys as shown in Figure 2.9. The remaining two keys 'g' and 'h' on the second row are operated by the forefingers (Index Finger) of left and right hand, respectively.

- ***Allocation of keys to fingers on the third row (upper row)***

The next step is learning the key-reaches from the Home Row to the row above it. The learning begins with the reaches from 'a' to 'q' by left hand little finger and from ';' to 'p' by right hand little finger. This is followed by the placement of the third fingers (Ring fingers) to the adjoining keys 'w' and 'o' and so on (Figure 2.10). In the third row, the allotment of fingers is explained below.

LF	RF	MF	IF	IF	IF	IF	MF	RF	LF
Q	W	E	R	T	Y	U	I	O	P

Fig: 2.10: Allocation of fingers on the third row

While typing on the upper row, keep fingers on home row. Lift fingers of left hand and strike upper row key one by one and type
q w e r t (r and t are typed by the same finger)
Now, again lift the fingers of right hand and strike upper row keys one after another and type
p o i u y (u and y are typed by the same finger)
You should ensure that one finger should move at a time, while other fingers should remain on the home row.

- ***Allocation of keys to fingers on the first row (bottom row)***

After learning how to operate keys on Home Row and Third Row, the next step is to learn how to operate keys on the First Row. Keys Z, X, C, V, B, N, M, Comma, Full Stop and '/' sign are located on this row.

- ***Allocation of keys to fingers on the Fourth Row (Number Row)***

In this row, type 1, 2, 3 with little, ring and middle 9fingers of the left hand, respectively, and 4 and 5 with the index finger (forefinger). Similarly type 0, 9, 8 with little, ring and middle fingers of right hand, respectively, 7 and 6 with index finger (forefingers).

Fig. 2.11 Numeric Keypad on keyboard

LF	RF	MF	IF	IF
1	2	3	4	5
IF	IF	MF	RF	LF
6	7	8	9	0

Using numeric keypad

The numeric keypad has four columns and five rows. The row which has 4, 5, 6 and + is called Home Row. This is the row which is initially practiced by a touch typist.

On a numeric keypad, the number 5 is the guide key. It has a small raised tangible mark which serves as a guide for the touch typist in the placement of fingers on other keys.

Allocation of rest of the keys on numeric keypad '0' is to be pressed by the right-hand thumb. One can also make use of calculator keyboard for numeric keypad practice.

Successful keyboarding tips

The following points may be kept in mind for successful keyboarding techniques.

- Press the keys with feather touch and do not put undue pressure.
- Rest your fingers on Home row while typing.
- Allow your fingers to fall naturally on the keys so that each rests on top of the next key along the same horizontal row.
- While typing, release the key immediately as soon as you press it. Holding the key for long time, will repeatedly type the same character.
- Do not look at the keyboard while practicing.
- Press the keys with equal intervals of time in rhythm.
- Press the keys only with the fingers allotted for them.
- While pressing a key, say slowly pronounce the character on the key.
- Do not take any mental stress while typing.
- Secure typing ergonomics.
- Maintain patience if committed mistake at initial stage.
- Maintain a balance between speed and accuracy, as both are equally important. Do not sacrifice accuracy for speed.
- To gain mastery of computer keyboard, undertake repeated practice of typewriting words, sentences, passages and figures without looking at the keyboard.

Using typing software

Introduction to Rapid Typing Tutor

Rapid Typing Tutor is a Free and Open Source Software (FOSS) designed to learn typing skills on the computer. It is free to use and share with others for free, but only by using the original distribution package. Learning to type is fun with the typing game included with Rapid Typing Tutor.

Touch typing technique

Touch typing improves typing speed and accuracy. A touch typist never looks at the keyboard. The fingers hit the right keys by habit. The typist is entirely focused on the text being typed, reading the words and phrases as the fingers type the text reflexively. Touch typing can be learned by performing special exercises.

Stage one of the process begins with learning the Home Row of the keyboard (the row beginning with the Caps Lock key). Looking at the keyboard is strictly forbidden. This is followed by learning the lower and upper rows, the numbers row, uppercase letters and special symbols.
Stage two involves memorising frequently used syllables and typing words containing these syllables.
Stage three involves typing actual text to perfect the skills acquired.

Touch typing rules

Fig 2.13: Keyboard layout for learning typing

- The F, D, S, A, and J, K, L, ; keys (on a QWERTY keyboard) represent the base position. Keyboards usually have small protrusions on the F and J keys. They help your fingers locate the base position without looking at the keyboard. Try to return your fingers to the base position after each keystroke.
- Colour coding shows which finger should press each key (see the picture above). The left index finger is reserved for all the red keys. The right index finger is reserved for green keys, and so forth. Use the thumb of whichever hand is more convenient for you to press the Space key.
- The base position on the numeric pad is the number 5 key for the middle finger, 4 for the index finger, and 6 for the ring finger. The numeric pad simplifies and speeds up numerical data input.
- Uppercase letters and symbols appearing on keys in the numbers row are typed by one hand with the little finger of the other hand holding down the SHIFT key.
- Do not look at the keyboard. Try to locate the right key with your fingers.

After configuring settings in Wizard, Rapid Typing's main window will appear as shown in Figure 2.14.
Let us familiarise with the **Typing Tutor** interface. The window is composed of the following controls:
Taskbar allows to set or change some basic options to start a lesson (keyboard layout, level, lesson, and background).

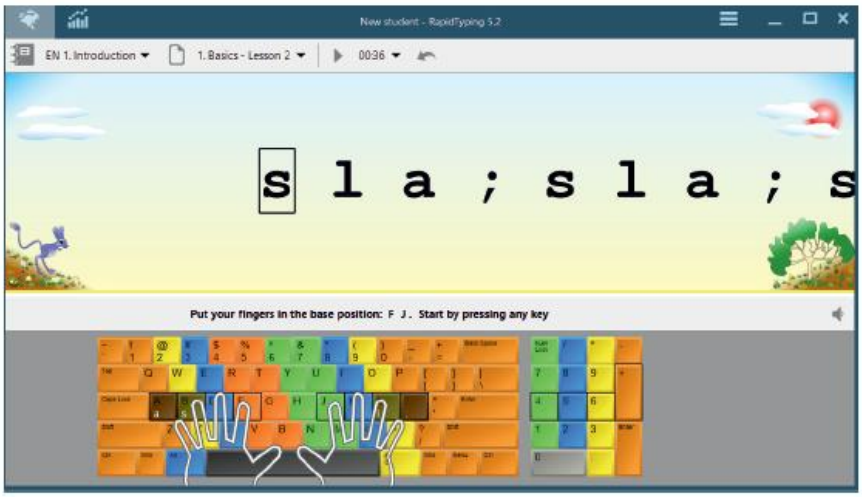


Fig 2.14: Rapid Typing's main window

Three horizontal buttons in the top-right corner (Options, About and Help) can display the corresponding dialogs.

Three vertical buttons in the top-left corner (Lesson, Statistics and Lesson Editor) are used for switching between current lesson, User Statistics and Lesson Editor.

Text panel is the area where the text to be typed is displayed. You can easily edit it in Lesson Editor, if necessary.

Lesson control panel includes several controls to pause/resume the current lesson, enable/disable sounds, and adjust the sound volume.

Keyboard is the virtual keyboard that will help you to learn touch typing with all 10 fingers. You can customise its appearance in the 'Lesson' section.

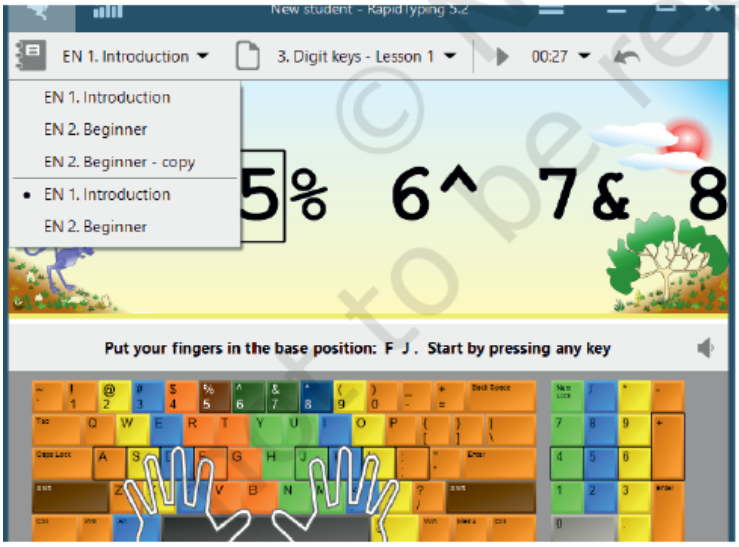


Fig 2.15: Beginning or Introduction to Rapid Typing tutor

Begin lessons

To start your first lesson in **Typing Tutor**, select the keyboard layout, level and lesson category on the Taskbar shown below.

There are four drop-down lists in the top-left corner of the screen. Therefore, moving from left to right, the procedure will be as follows:

- Choose the layout (i.e., the language of keyboard); it's "EN" on the picture above.
- Then, select a level (there are three levels available—Introduction, Beginner); it's "Beginner" on the picture above.

- Specify lesson category (depending on the level chosen, the available categories may vary).
- Finally, choose the lesson that you would like to study.
- When everything is ready, press any key, then put your fingers in the initial position shown on the keyboard and start typing the text.

There is also the Lesson Control Panel just above the Keyboard from where you can suspend/resume the current lesson or adjust the sound effects:

- To start/resume a lesson, click the ▶ button just above the top-left corner of the keyboard.
- To pause a lesson, click the ‖ button that is displayed instead of the ▶ button.
- To restart the current lesson, click the button, which is the far right button on the Taskbar.
- To enable/disable sounds in the current lesson, click the button located above the top-right corner of the keyboard and set the sounds volume using the vertical slider.

You can also set the background image for the Text Panel by choosing an option (Animation, Wallpaper or Plain) from the dropdown list on the Taskbar in top-right corner of the window

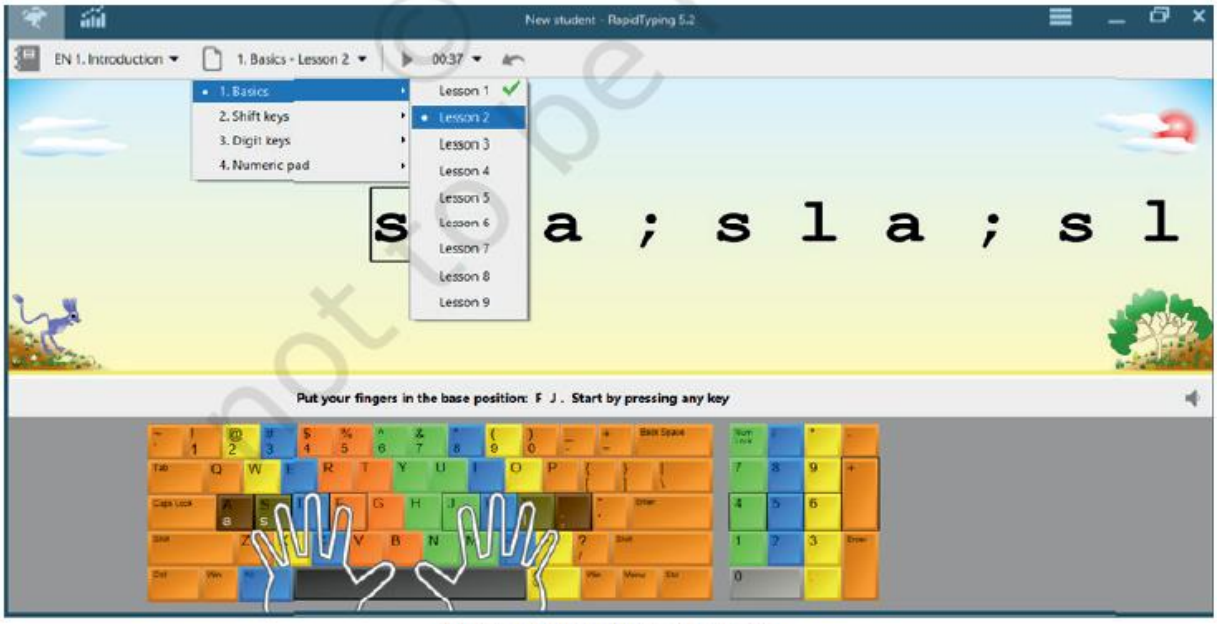
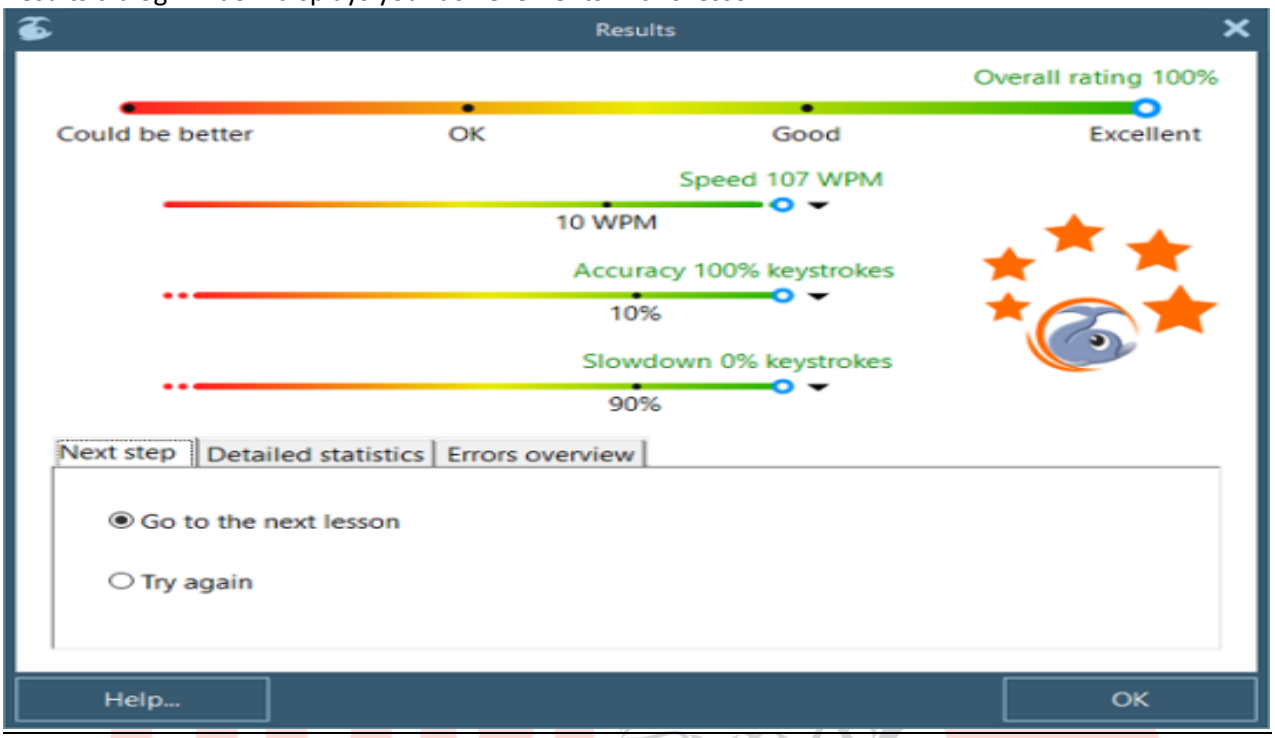


Fig 2.16 Selecting a Lesson

How to interpret your results

Results dialog window displays your achievements in this lesson.

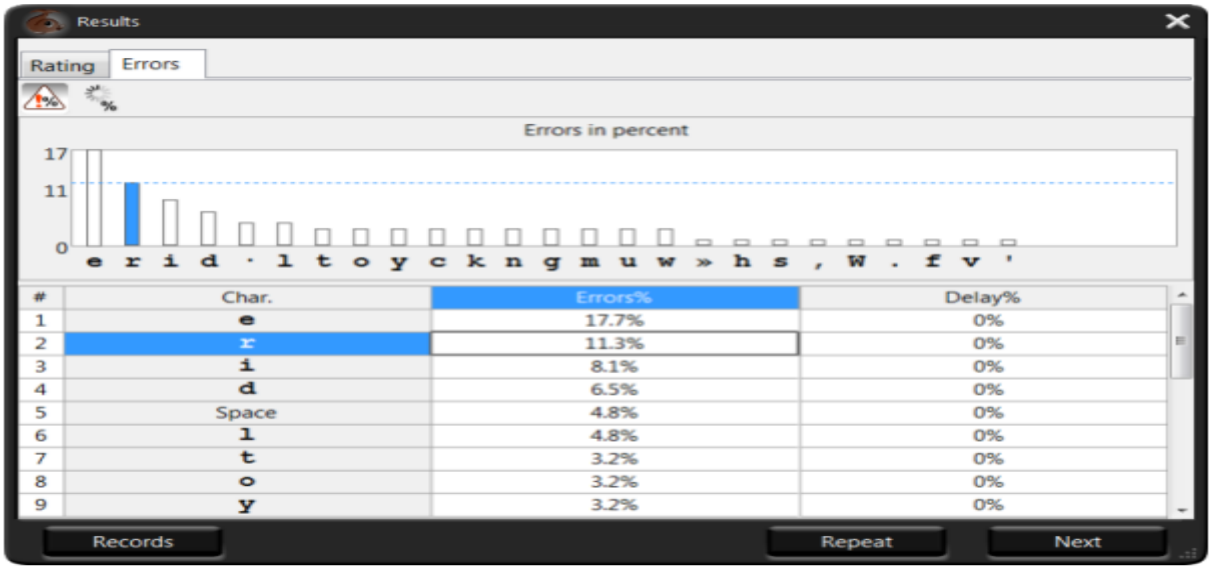


The colour indication is as follows:

- **Green** letters denote right inputs.
- **Yellow** letters stand for right inputs exceeding the acceptable timeframe.
- **Red** letters denote wrong inputs within the acceptable timeframe.
- **Orange** letters indicate wrong inputs that also exceed the acceptable timeframe (it's the worst result).

Error window

On the Error tab you can view your detailed statistics for the current lesson. This tab shows your errors and delays percentage both in the graphical and table view.



View and analyse statistics

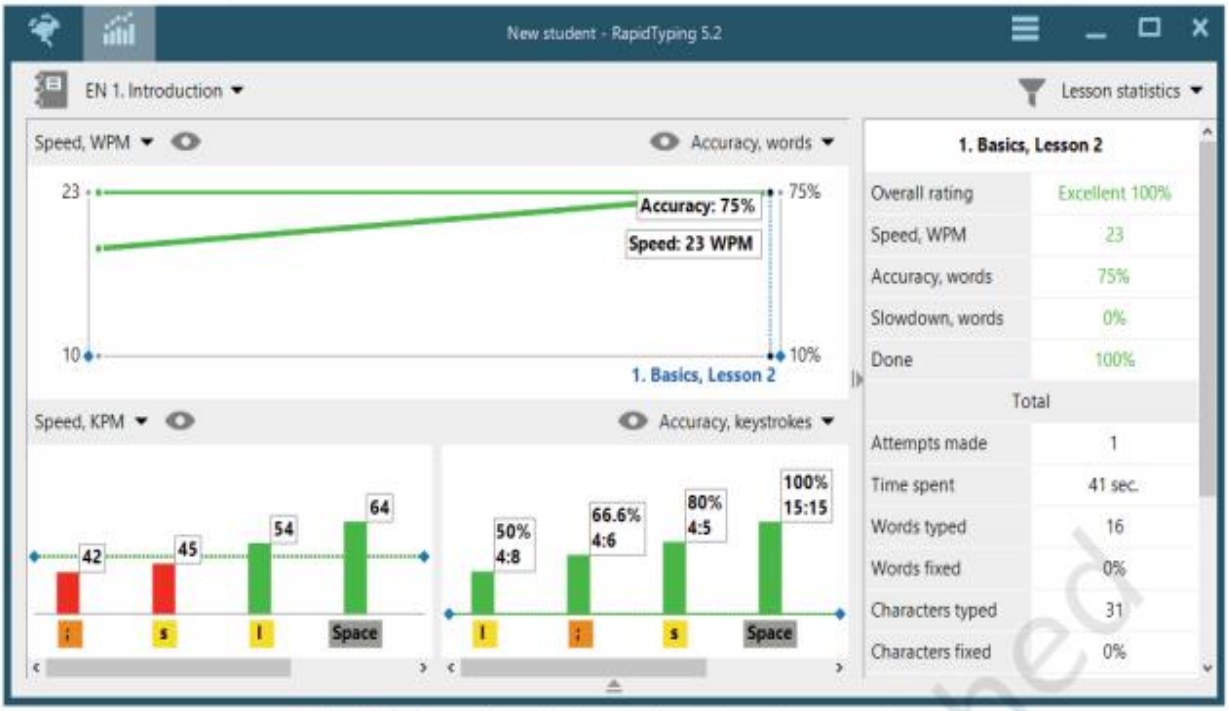


Fig 2.18: Overall statistics and progress of your typing

you can review your overall statistics and progress both in graphical and table view.

The following options are available:

• Click the button in the top-left corner of the window (or press Ctrl+1 on your keyboard) to see your CPM speed (characters per minute) progress.
• Click the button (or press Ctrl+2 on your keyboard) to see your WPM speed (words per minute) progress.
• Click the button (or press Ctrl+3 on your keyboard) to see how your typing accuracy changes in the different lessons.

Detailed lesson statistics

To review the statistics for a particular lesson, choose this lesson in the right table and click the Lesson tab in the top-right corner. The Lesson tab contains the same data that are displayed upon completion of every lesson.

Working with lesson editor

To open Lesson Editor, click the button in the top-left corner of the Rapid Typing window

- Taskbar which allows to select the keyboard layout and level of the lesson to edit.
- Toolbar which includes Basic_lesson1 or lesson 2…., for inserting text.
- Navigation Tree which shows the existing courses and lesson hierarchy.
- Text Panel, an area where you can edit the text of the lesson currently selected in the NavigationTree.

- Lesson Metrics which displays the number and percentage of words, characters, spaces and specific characters in the lesson.
- Keyboard, which is the virtual keyboard that highlights the characters used in the currently selected lesson. You can customise its appearance in the 'Lesson' section.

To open Lesson Editor, click the button in the top-left corner of the RapidTyping window. The screen will appear as shown in the picture below.

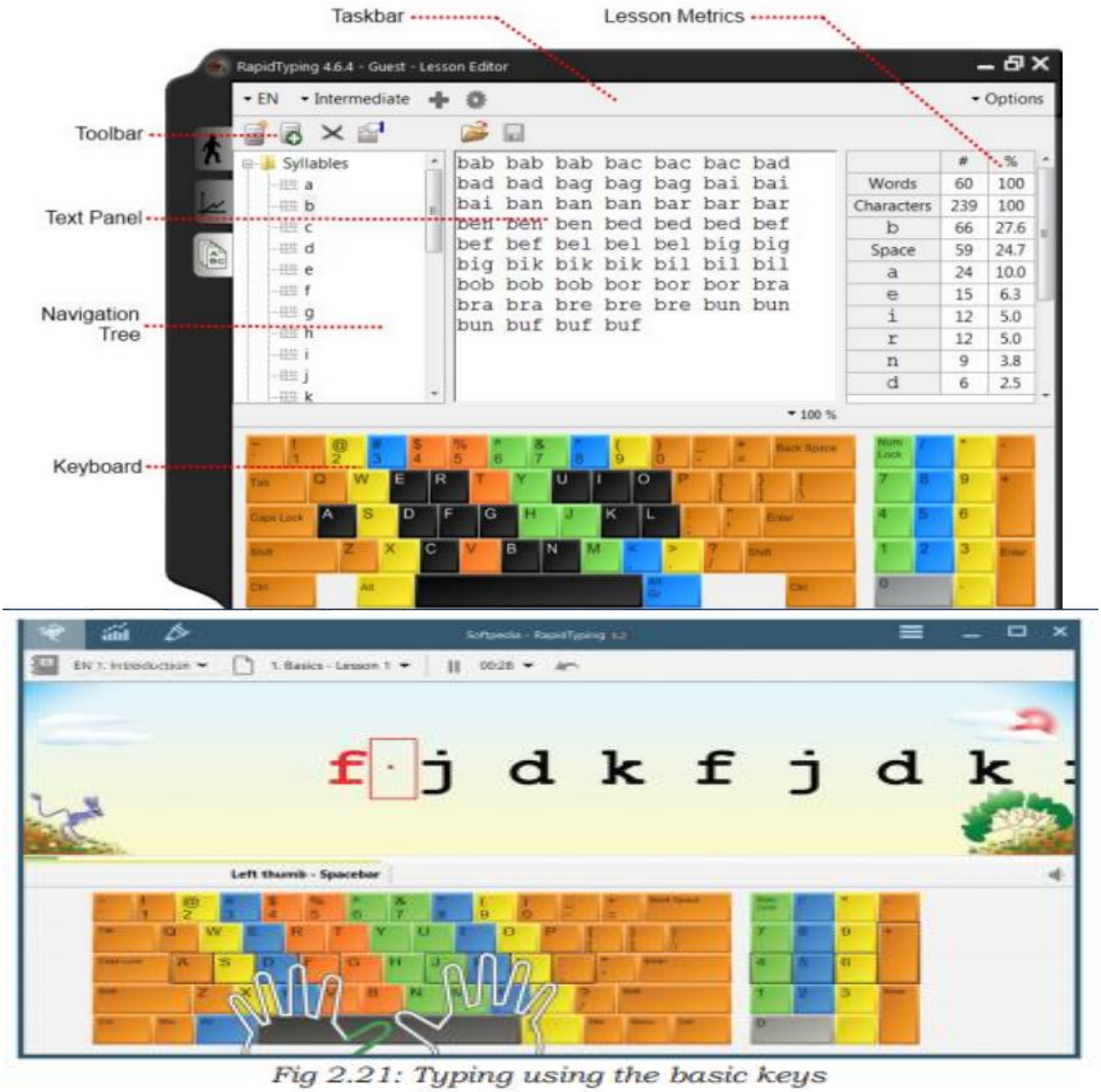


Fig 2.21: Typing using the basic keys

Fig 2.22 Type using Shift key

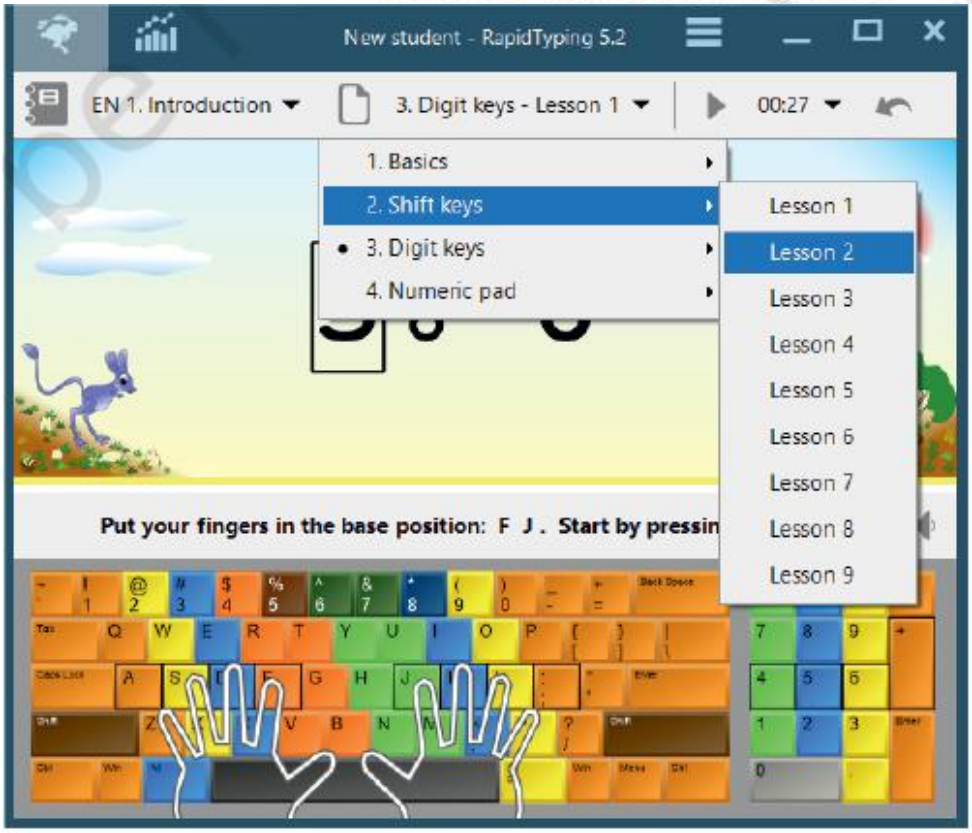


Fig 2.23 Type using Digit key

Fig 2.24 Type using the Numeric Keypad

Calculating the typing speed

Types	Description	Formula
WPM	the number of words typed in a one minute period of time	WPM = (Words without errors + Words with errors) / Time spent in minutes
Net WPM	the WPM without words with errors	Net WPM = WPM - (Words with errors / Time spent in minutes)
CPM	the number of characters typed in a one minute period of time	CPM = (Characters without errors + Characters with errors) / Time spent in minutes
Net CPM	the CPM without characters with errors	Net CPM = CPM - (Characters with errors / Time spent in minutes)
KPM	the number of keystrokes in a one minute period of time	KPM = (Keystrokes without errors + Keystrokes with errors) / Time spent in minutes
Net KPM	the KPM without keystrokes with errors	Net KPM = KPM - (Keystrokes with errors / Time spent in minutes)

Good typing speed

An average professional typist types usually in speeds of 50 to 80 wpm, while some positions can require 80 to 95 and some advanced typists work at speeds above 120 wpm.

A. Using your left-hand type

asdfasdfasdfasdfasdfasdfasdfasdfasdfasdfasdf
fdsafdsafdsafdsafdsafdsafdsafdsafdsafdsafdsa

B. Using your right-hand type

;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj ;lkj

Using your both handstype

ghghghghghghghghghghghghghghgh

C. Stretch your left index finger up/out to T (look on the keyboard) and type

thththththththththththththththththththth

D. Using your left-hand type

deed frrf deer reed red deed frrf deed reed red deed frrf deer reed red

E. Using your right-hand type

ujkiikjujkikjuujkiikjujkikjuujkiikjujkikjuujkiikjujkikjuuj kiikjujkik

F. Using both your hands type

juut jut jute kiit kit kite juut jut jute kiit kit kite juut jut jute kiit kit kite jud judder jug jugger judge judged juud judder jug jugger judge judged igh high thigh ight fight right fright igh high thigh ight fright right fright

Typing accuracy

Typing accuracy is defined as the percentage of correct entries out of the total entries typed.

Description	Formula
Accuracy in the words, percent	Accuracy = (100% - Words with errors * 100%) / Total number of words
Accuracy in the characters, percent	Accuracy = (100% - Characters with errors * 100%) / Total number of characters
Accuracy in the keystrokes, percent	Accuracy = (100% - Incorrect keystrokes * 100%) / Total number of words

Typing rhythm

In the touch typing techniques the typing rhythm is very important. Typing rhythm means the keystrokes should come at equal intervals.

Description	Formula
Errors in the words, percent	Errors % = Words with errors * 100% / Total number of words
Errors in the characters, percent	Errors % = Errors = Characters with errors * 100% / Total number of characters
Errors in the keystrokes, percent	Errors % = Incorrect keystrokes * 100% / Total number of keystrokes

Slowdown (percentage slowdowns) calculation:

Description	Formula
Slowdown in the words, percent	Slowdown % = Words with delay * 100% / Total number of words
Slowdown in the characters, percent	Slowdown % = Characters with delay * 100% / Total number of characters
Slowdown % in the keystrokes, percent	Slowdown % = Keystroke delay * 100% / Total number of keystrokes

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