

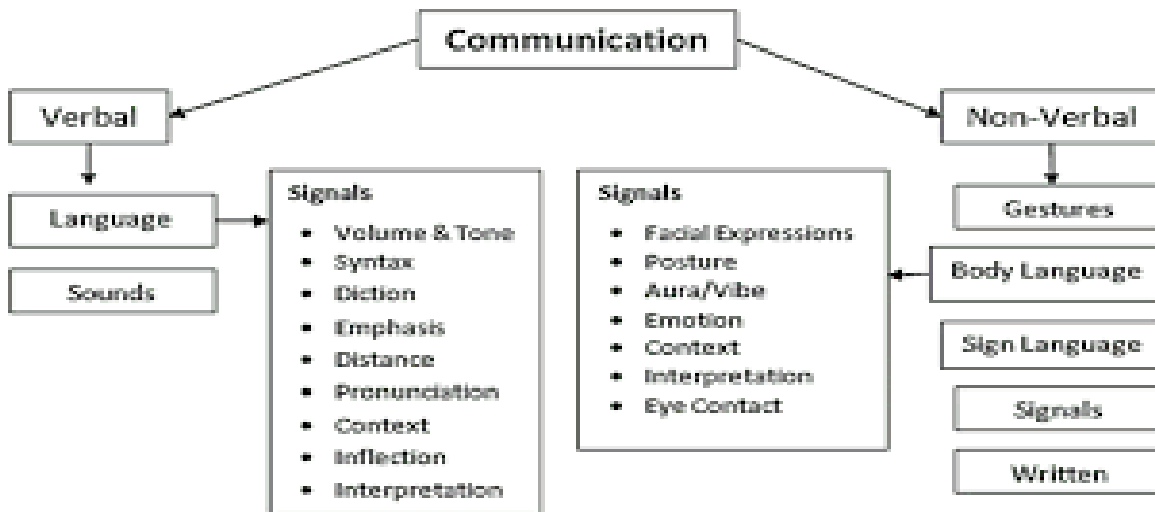


1. What is Communication?

Communication is the act of conveying meanings from one entity or group to another through the use of mutually understood signs, symbols, and semiotic rules.

*The following figure represents types of communication

(Fig 1)



Learning objectives of Effective communication

1. Development of Interpersonal Skills
2. To express effectively & with maximum efficiency

Communication skills are beneficial in and out of the workplace. Having the ability to clearly communicate instructions, ideas and concepts can help you find success in any career. With practice, anyone can develop their communication skills.

2. Active Listening

One of the most critical skills in effective communication is **Active listening**. Developing this soft skill will help build and maintain relationships, solve problems, improve processes and retain information such as instructions, procedures and expectations.





2.1 Why is active listening important in the workplace?

Whether we are seeking a new job opportunity, striving to earn a promotion or working to improve in our current role, improving our active listening skills will help us succeed. Much like critical thinking and conflict resolution, this soft skill will help increase our value.

Here are several benefits of being an active listener:

- **It helps us build connections.**

Active listening helps others feel comfortable sharing information with us. When we demonstrate our ability to sincerely listen to what others have to say, people will be more interested in communicating with us on a regular basis. This can help open up opportunities to collaborate with others, get work done quickly or start new projects. All of these things can help lead us to success in our career.

- **It helps you build trust.**

When people know they can speak freely with us without interruptions, judgment or unwelcome interjections, they'll be more likely to confide in us. This is especially helpful when meeting a new customer or business contact with whom we want to develop a long-term working relationship.

- **It helps you identify and solve problems.**

Actively listening to others will help you detect challenges and difficulties others are facing, or problems within projects. The more quickly you're able to spot these issues, the sooner you can find a solution or create a plan to address it.

2.2 Four Steps to Active Listening

Active listening requires four discrete steps.

CONTACT—connect with the participant who is contributing; eye contact, open posture, and nonverbal responses.

ABSORB—take in all aspects of the spoken message, implicit and explicit and nonverbal clues. Do not judge or evaluate.

REFLECTIVE FEEDBACK—mirror, reflect, or feedback what you have heard and why the contributor claims to be valid.

CONFIRM—receive confirmation from the speaker that you heard the participant's message accurately. If not, start the method over again at the beginning by having the speaker restate their view.

2.3 Demonstrating Active Listening skills

The Story teller

In this game, the teacher starts a story with a beginning phrase, and then each child in the classroom adds one word to the story in turn. Students must be active participants and follow the story closely so that when their time comes to add a sentence, the story will make sense. Another way to practice this is by playing a traditional game of Telephone where a message is passed around the room to see if it stays the same.

Active Listening Skills(game)

Directions: Read and listen to the statements below. After reading and listening to the teacher read the statements, write a response for each statement demonstrating reflective listening on the part of you the listener. Your answer should demonstrate the response. Remember a dialogue is a conversation between two people. One person sends a message (the statement. The person who receives the message then responds (your written response). Make sure to include all of the points each speaker makes. Do not assume (Note: offering reasons, solutions or excuses for behaviour is not part of the reflective listening response and must be avoided.).

In each of your responses, underline all words that show you will restate the points made by the original speaker. Look at the example below. Note each part of the sender's statement is also mentioned in the reflective listening statement.

- (Statement) I get furious with him when he says things that suggest that I don't take good care of the kids.
- (Active Listening Response) What I think I hear you saying is that you feel furious when he implies that you're not a good care giver for your kids.

From the statements listed below, select a different phrase to use for each one of the dialogues you need to complete.

- "What I think I hear you saying is..."
- "In other words, you think that..."
- "Correct me if I'm wrong, but aren't you saying..."
- "Let me review what I've heard you say. Please correct me if I leave anything out."
- "I hear you saying...Is that right?"

1. **Father to Son/Daughter:** "I am sick and tired of you asking to borrow the car/bike when you haven't completed your homework or your chores, you leave your room in a total wreck and you have been disrespectful to your family. You need to grow up and learn to show some respect.

Response:

2. **Teacher to Student:** "I am very concerned about your lack of progress in this course. You haven't been keeping up with your work and the work that you have been submitting is of poor quality. You are a senior and this course is a graduation requirement. If you don't start turning in your work you are going to fail this course and possibly miss graduation."

Response:

3. **Friend to Friend:** I just don't know what to do about my parents. It seems like they just don't understand me. Everything I like seems to go against their values, and they just won't accept my feelings as being right for me. It's not that they don't love me, they do, But they just don't accept me.

Response:

2.4 Designing poster on steps of Active Listening



3. Interview Skills

Interviewing is a skill in and of itself, one in which our ability to interact with the interviewer and to articulate our thoughts are factors that are just as important in getting the job as are the qualifications listed on our resume.



3.1 Interview Do's and Don'ts

3.1.1 DO's

a) What to do before an interview

- Get a good night's sleep the night before.
- Do research.
- Eat a good breakfast.
- Prepare questions beforehand.
- Know who will be interviewing and learn a bit about their background.
- Know your strengths and put together a list of them.
- Turn off your cell phone
- Prepare a solid list of references

b) What to do during beginning of an interview

- Do try to sparkle! Use gestures in your conversation. Make sure they are smooth and emphatic.
- Do smile.
- Do make sure you get the interview's name right and use it a few times in the interview
- Do go to the rest room before you visit the employment lobby. It is embarrassing to interrupt an interview, and you want to be as comfortable as possible

c) What to do during an interview

- Do look the interviewer in the eye. Recruiters place a lot of emphasis on eye contact.
- Do take notes
- Let your achievements speak for you.
- Take a second before answering a question.
- Sit up straight.
- Ask questions.

d) What to do after an interview

- Do let the interviewer decide when the interview is over.
- Do ask the interviewer when you will hear from him or her again if he or she does not offer the information.
- Drop off a thank you note. Always thank interviewer after you have left.
- Follow up appropriately.
- Create a list of items that you did well and you like to improve on.

3.1.2 Don'ts

- Don't be late. In fact, plan to be early for any scheduled interview. If you are late or arrive just in the nick of time, the interviewer will start to wonder
- Don't sit down until you are asked.
- Don't lean on or put your elbows on the interviewer's desk. Sit back in your chair, so the interviewer can see more of you. Sit erect.
- Don't show your nervousness by drumming your fingers, swing your leg, or cracking your knuckles.
- Don't talk too quickly
- Don't digress from your points. Answer questions directly.

- Don't use words you do not know meaning of
- Do not use slang.

3.1.3 To teach interview skills in high school, we should follow these four steps:

- Introduce interview skills
- Talk about why good interview skills matter
- Explore what good job interview skills look like
- Group project

A practical, and interactive activity for participants to learn how to prepare for a job interview. This activity will help them avoid some common mistakes before or during a job interview.

Warm- up Activity:

Words “ Interview” will be written on the Whiteboard/blackboard which be followed by discussion..The participants will be put be questions like:

- When was the last time you had an interview?
- Did you have good or bad experiences?
- Do you have any interview- related stories?
- d. Brainstorm some common mistakes before or during an interview and write them down.

<https://www.youtube.com/watch?v=S3I7COBI77U>

A small video clip will be played will played for a few times and then the

Students will prepare five questions of their own on what they should and should not do during an interview . For example,

“What should you prepare for your interview?”

“What should you do at the interview?”

“What shouldn't you do at the interview?”

(3) On the whiteboard, write the following questions and ask the students to repeat with you a few times, and then pair the students to do the questions and answers. (Optional: The teacher can write down the participants answers on the white board.)

- What should you do before the interview?
- What should you do at the beginning of the interview?
- What should you do during the interview?
- What shouldn't you do at the interview? ...
- What should you do after the interview?

Activity (Group Project)

All about me

One of the first steps in an application process is telling the school /college/company a little bit about yourself. The students write a paragraph about themselves giving whatever information they think a potential school or employer would want to know including their education. Then, they will write a second version of their paragraph that leaves out some of the information in the first and also includes other information not in the first version. Collect students' papers and choose some of the best pairs to share with the class.) Have students work in pairs to look at the two versions of the about me paragraph with each person in possession of one version. Without reading each other's copies, the students will talk until they can point out which information each version has that is different from their partner's and what information each version is lacking.

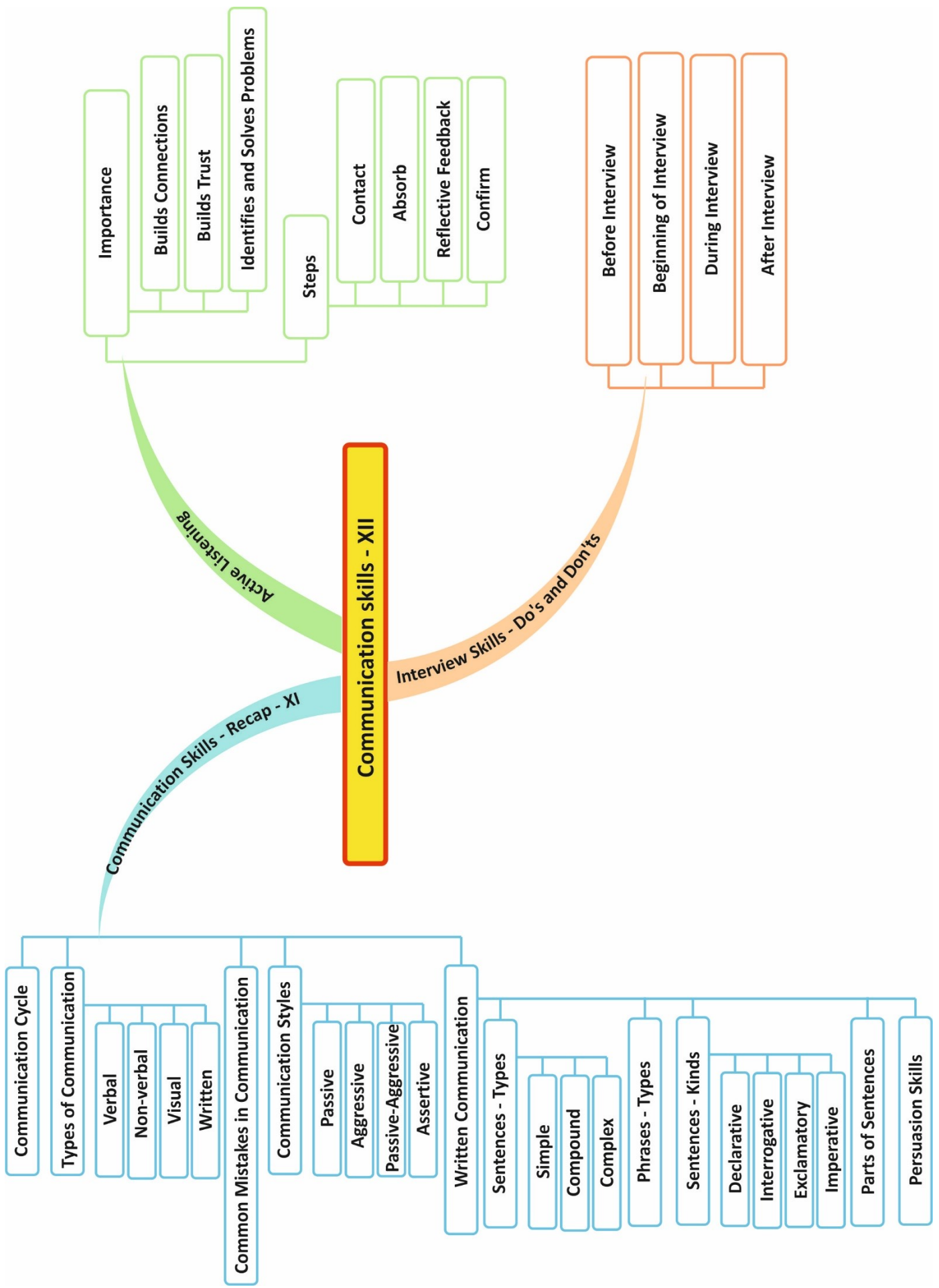
Summary

A classroom environment relies heavily towards your classroom climate. Students with effective communication skills will be more likely to contribute to class discussions, will be more productive members in group projects, and will ultimately gain more from their experience in the class. Learning and practicing writing skills help students to handle professional and social tensions.

References

: Google
: You tube
: British council Library







1. Self Motivation

Motivation is defined as the drive required to engage in goal-oriented behaviour. Motivation is inner urge to do something and self-motivation is ability to do what needs to be done without the influence or thrust from other people or situations. Self-motivated individuals are asset to the world, their country, their families and to themselves. Self-motivated individuals practice righteousness. They do what is required to accomplish their goals. Self-motivated people have elevated spirit and are full of positivity. For them nothing is impossible. They are focused on their goals and objectives and diligently achieve their aims.

Self-motivation is important because

- It increases individual's energy and activity.
- It directs an individual towards specific goals.
- It results in initiation and persistence of specific activities
- It affects cognitive processes and learning strategies used for completing similar tasks.

1.1 Finding and listing motives



Motivation is classified in different types by different authors such as motivation based on physiological and psychological needs. Physiological motivation is based on the physical needs to satisfy hunger or thirst. Physiological motivation directs the behaviour towards satisfying specific bodily needs. Psychological motivations can be guided by need for achievement and need for affiliation. The need for achievement is a social form of motivation involving a competitive drive to meet the standards of excellence. The need for affiliation involves the need to seek and enjoy close and cooperative relationships with others and be loyal to a friend. Motivation is also classified as internal or external motivation. In case of internal motivation, an individual

demonstrates a desire to do his/her work without any external reward. External motivation occurs when we feel driven by outside forces, performing an activity either to obtain a reward or to avoid punishment. For example, a student who is internally motivated will learn, complete the assignments on his/her own, whereas a student who is externally driven will be completing lessons to avoid punishment or to gain reward. Motivation, basically answers "why", the reason behind doing a task. A person, may be internally or externally motivated. in different situations or may be driven by physiological and psychological needs. One should identify the motivation in every occasion to handle oneself better.

1.2 Finding sources of motivation and inspiration

Following are the sources of motivation and inspiration.

- **Music**

Music is the language of the soul. A good inspiring piece touches every heart and can help create miracles.

- **Books**

Books are said to be best friends. They expand our horizon of thinking. They help us visualize the unknown and uncharted territories beyond our capacities. Books about heroic acts, inspiring lives and stimulating creativity help readers move beyond their routine lives.

- **Activities :**

Engaging in positive and skill enhancing activities keep our spirits high. Competitions, games, simulations, interviews for various committee positions are found to encourage, motivate and inspire students.

- **Expansive thoughts:**

Thinking and discussing big and positive ideas motivate us to reach our highest potential.

- **Living in the present :**

Being present where we are rather than where we are not, brings in peace and calmness in our life. A calm and peaceful mind can help us achieve wonders. This quality of being aware and conscious of one's self in present moment is also called mindfulness. Mindfulness helps students to pay attention, reduce stress and helps promote thoughtful approach towards life.

- **Dreaming big :**

Dreaming big is a journey not a destination. Dreaming big helps us to be mentally prepared to take that big leap forward. Only when we aim high, we get motivated to work hard and achieve big things in life.

2. Personality Types, Traits and Disorders



2.1 Meaning of personality

Personality is relatively enduring set of traits. These traits are made up of emotional, behavioral and mental set of characteristics. Heredity has been found to be determining personality apart from environmental forces. Personality is shaped through family, culture, society, education and other environmental factors.

2.2 Influence of personality

Personality affects all aspects of an individual's performance, even how he/she reacts to situations in life. Individuals shall set clear goals for themselves and diligently pursue them. Behavioral tendencies like anxiety, stress, perseverance and conscientiousness reflected in personality traits can influence academic performance.

2.3 Basic personality traits

According to trait theory, combining a set of observable traits into a group forms an individual's personality. One popular personality classification is big five. The Big Five, global traits associated with work . are listed below:

- **Extraversion:** Gregarious, assertive and sociable.(Opposite reserved, timid, quiet.)
- **Agreeableness :** Cooperative, warm and agreeable.(Opposite cold, disagreeable and antagonistic)
- **Conscientiousness :** Hardworking, organized and dependable(lazy, disorganized and unreliable)
- **Emotional stability :** Calm, self-confident and cool(insecure, anxious and depressed)
- **Openness to experience :** Creative, curious and cultured(narrow interests)

2.4 Common personality disorders

Following are the common personality disorders. If anyone is identified with these disorders, counselling shall be provided by family members, teachers and counsellors.

- **Paranoid**

Feeling extremely nervous and worried because you believe that other people do not like you or are trying to harm you.

- **Antisocial**

Is characterized by a pattern of persistent disregard for and violation of the rights of others.

- **Schizoid**

Is characterized by a lack of interest in social relationships and people tend to be distant, detached and indifferent.

- **Borderline**

Is marked by an ongoing pattern of varying moods, self-image and behaviour. These symptoms result in impulsive actions and problems in relationships.

- **Narcissistic**

Is a condition in which people have an inflated sense of their own importance, a deep need for excessive attention and admiration and lack of empathy.

- **Avoidant**

Avoidant personality disorder is characterized by feelings of extreme social inhibition, inadequacy, and sensitivity to negative criticism and rejection.

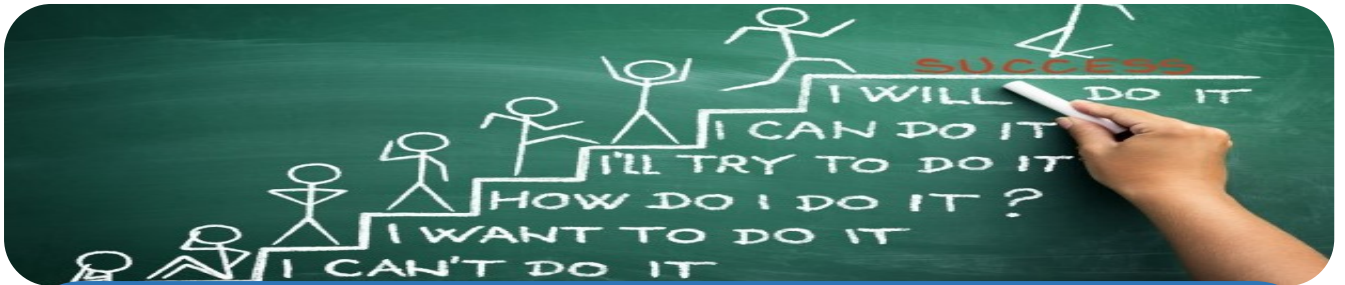
- **Dependent**

Dependent personality disorder is a condition marked by an overreliance on other people to meet one's emotional and physical needs.

- **Obsessive**

Obsessive-compulsive personality disorder (OCPD) is a personality disorder that's characterized by extreme perfectionism, order, and neatness.

ACTIVITY



Lets' Do It !!

Activities

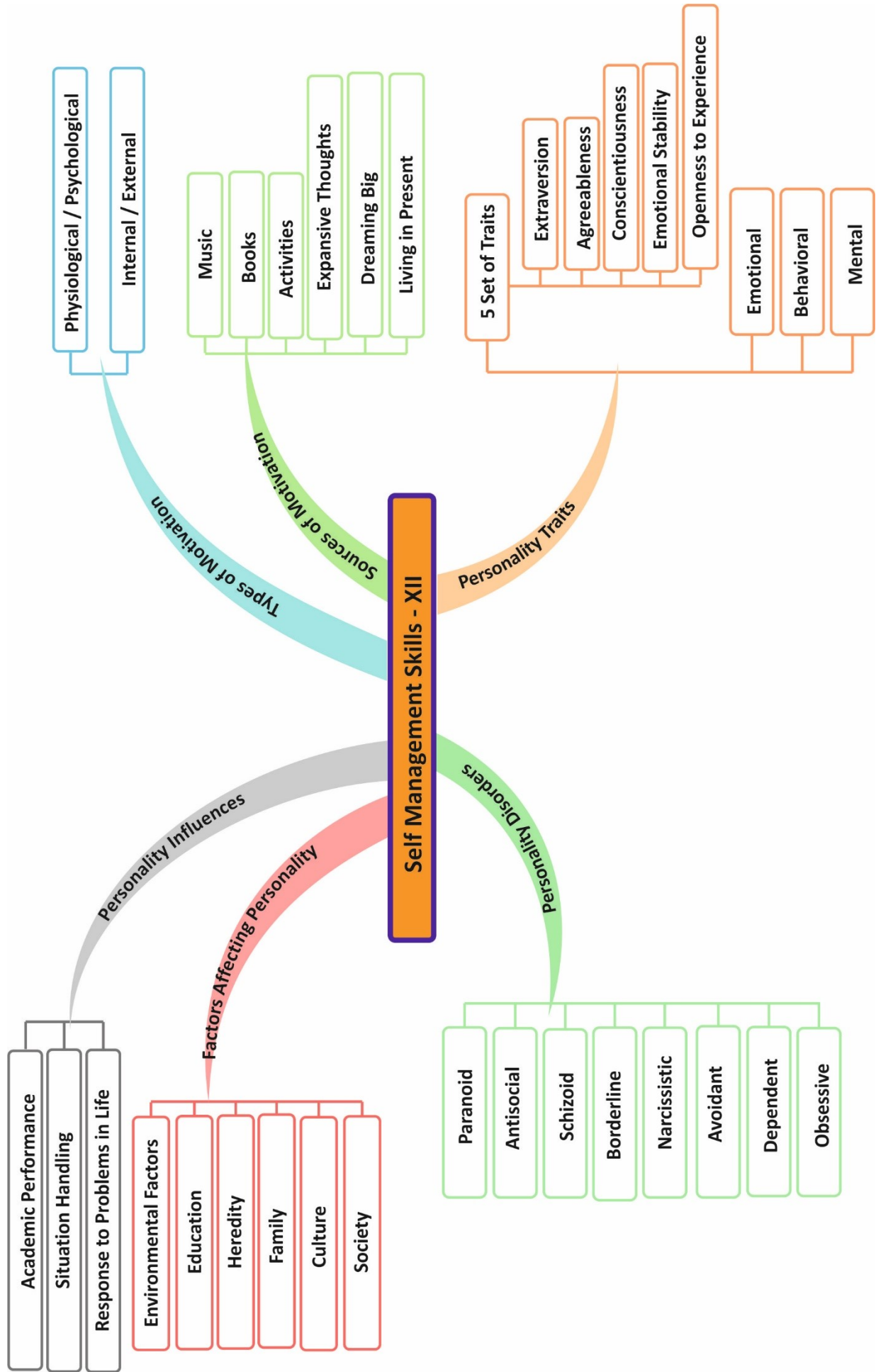
Session A. Group Discussion on identifying needs and desires in general

Session B. Discussion on sources of motivation and inspiration, finding their own sources

Session C. Demonstrate the knowledge of different personality types. Try to identify your own personality

Session D. Essay on reflections on self-personality type







Unit 1. Performing Tabulation Using Spreadsheet Application

1.1 INTRODUCTION TO SPREADSHEET APPLICATION

OpenOffice Calc is a spreadsheet program, a part of the free OpenOffice suite. The program is easy to use and contains most of the commonly used features found in commercial spreadsheet programs.

OpenOffice Calc is a software that helps in performing calculations using formulae and in analysing the data.

Do you remember your Mathematics notebook of your primary class?

It has small boxes to practice mathematics. These boxes are intersection of horizontal rows and columns.



A spreadsheet or electronic Spreadsheet is also a long sheet of rows and columns on the computer screen. This helps to manage and organize data in rows and columns.

Spreadsheets can be used to do calculations on data, create data reports, manage accounting documents, do data analysis, etc. You can also create graphical representation of data.

Another term that is used in a spreadsheet software is Workbook. A Workbook is another name for OpenOffice Calc file. A Workbook is a collection of one or more worksheets in a single file. Each sheet can have many cells arranged in rows and columns. In this chapter we will be discussing about Apache OpenOffice Calc 4.1.5. You regularly get updates of these softwares.

1.2 SPREADSHEET APPLICATIONS

Spreadsheet programs have become very popular because of the following features:

- Built-in functions make calculations easier, faster, and more accurate.
- Large volumes of data can be easily handled and manipulated.
- Data can be exported to or imported from other software.
- Data can be easily represented in pictorial form like graphs or charts.
- Formulae are automatically recalculated whenever underlying data values are changed.

1.3 CREATING A NEW WORKSHEET

In this section, we will discuss how to start OpenOffice Calc, components of Calc screen. Also we will learn how to create a new workbook and save it.

1.3.1 Starting OpenOffice Calc

To start OpenOffice Calc:

1. Click **Start** ➤ **All Programs** ➤ **OpenOffice 4.1.5** ➤ **OpenOffice Calc**.

- A spreadsheet workbook named Untitled1 opens up in an OpenOffice Calc application window (**Fig. 1**).

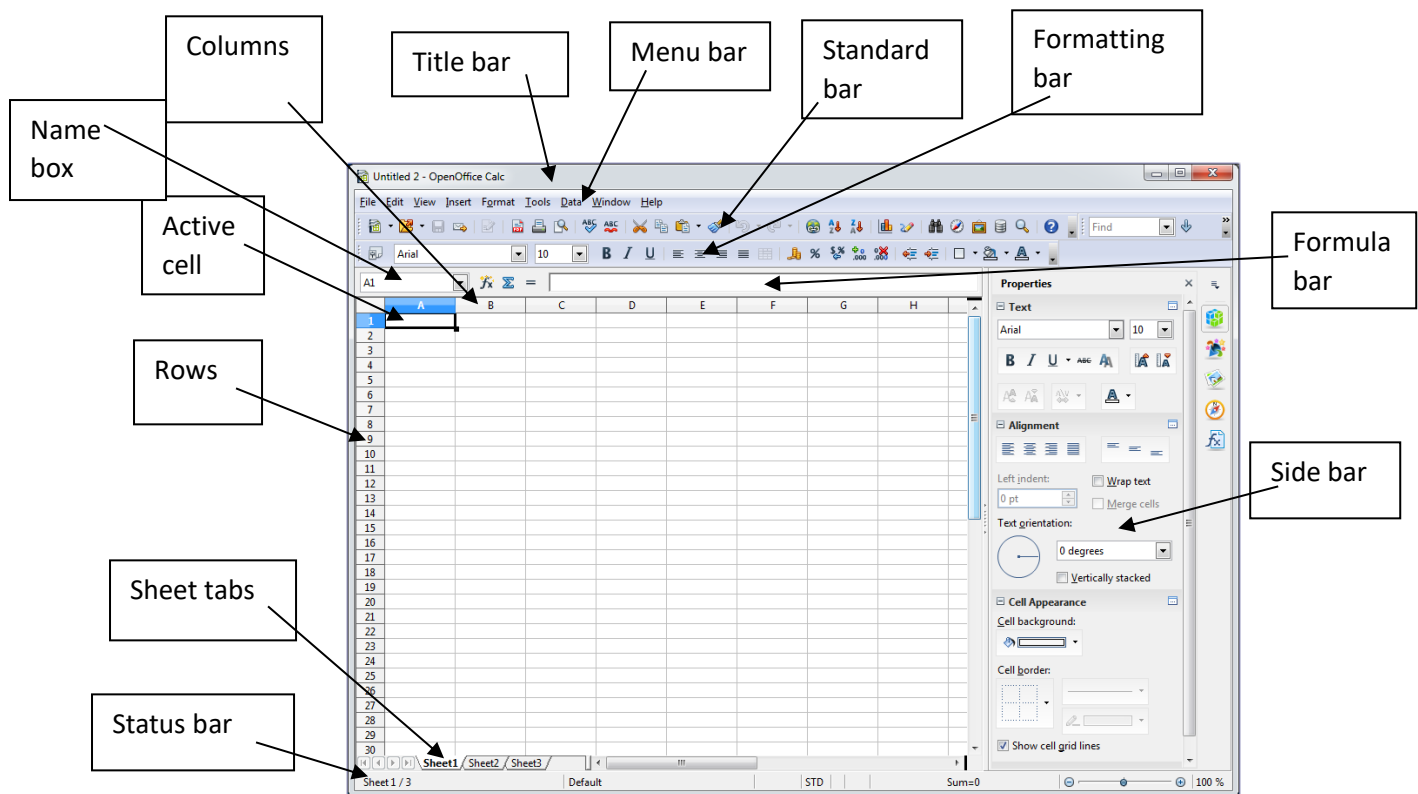


Fig. 1 OpenOffice Calc worksheet

1.3.2 Components of a Calc Screen

Title bar The Title bar is located at the top of the Calc window. It displays the name of the workbook on which you are currently working. When you create a new worksheet, is named as Untitled 1, Untitled 2, and so on. A workbook is a collection of one or more worksheets. The right side of the title bar contains the **Minimize**, **Restore Down** or **Maximize**, and **Close** buttons.

Menu bar The menu bar is located below the Title bar. It has commands like File , Edit, etc. Clicking on each menu option displays a list of commands.

Standard bar This bar contains icons (buttons) to provide quick access to commands such as **New**, **Open**, **Print**, **Copy**, and **Paste** etc.

Formatting bar It has buttons and drop-down menus that allow you to select a formatting option like, font, font color, alignment, number format, border, and background color.

Formula bar It contains the **Name Box** and a long white box, known as the **Input line**.

Name Box It is present to the left of the Formula bar and displays the address of the selected cell.

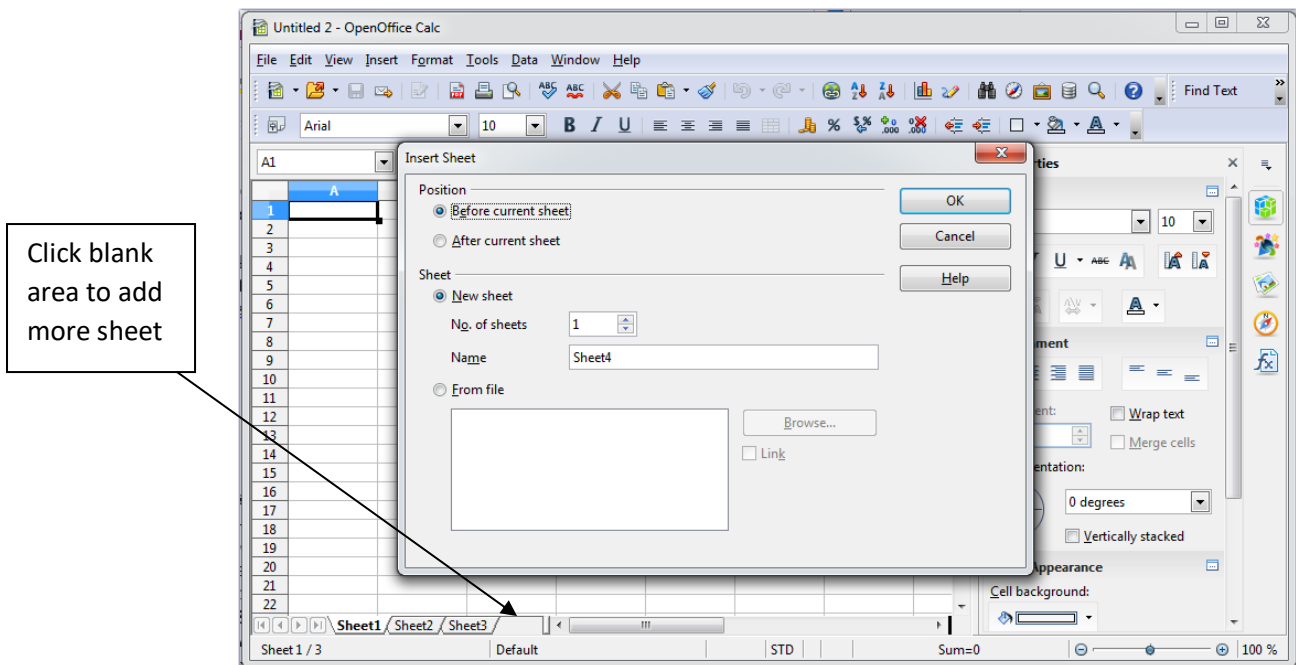
The rest of the window contains the spreadsheet. It is divided into rows that have a number at the left of each row, and columns with a letter at the top of each column.

Worksheet tabs A workbook, by default, opens three worksheets named as **Sheet1**, **Sheet2**, and **Sheet3**. You can click any sheet tab to open that worksheet.

To insert a new worksheet, the steps are:

1. Clicking the empty area after the sheet tab.
2. The **Insert Sheet** dialog box appears. (**Fig 2**)
3. Select the required option and click **OK**

Fig 2 Inserting a new sheet



You can also rename the sheet. Simply, double-click the Sheet name and type the new name.

Rows and columns A worksheet in OpenOffice 4.1.5 Calc has 1,048,576 rows and 1,024 columns. The rows are numbered from top to bottom along the left edge of the worksheet as 1, 2, and so on. Columns are labelled from left to right with letters A...Z, AA...AZ, A...BZ...AAA...AAZ, ABA...ABZ...AMA...AMJ.

Cell and Cell Address A cell is formed by the intersection of a row and a column. Each cell has a unique address which is formed by the intersection of row number and column letter. For example, a cell formed by intersection of column F and row 5 will have address F5.

Active Cell: Data is entered in a cell. To enter data in a cell, we have to first select it. The selected cell is called the active cell and is highlighted with a thick border. Also, the address of the active cell is displayed in the Name box.

Range of cells: A block of adjacent cells which are selected is called range of cells. For example, if the cells from A1 to B5 are selected, then the range of selected cells is referred as A1:B5. The cells in this range are – A1, A2, A3, A4, A5, B1, B2, B3, B4, and B5.

1.3.3 Creating a New Workbook

The steps to create a new Calc workbook are:

1. Select **File** ➤ **New** ➤ **Spreadsheet**.

Or

Click the **New Document** drop-down menu arrow on the

Standard bar and select **Spreadsheet**. (Fig 3)

Or

Press **CTRL + N**.

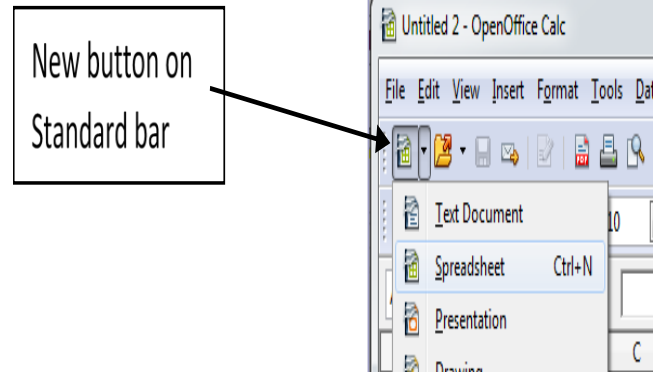


Fig 3 New button on Standard

1.3.4 Saving a workbook

The steps to save a workbook are:

1. Select **Save option** from the **File menu**.

Or

Click the **Save icon** on the **Standard bar** Or Press **Ctrl + S**

If you are saving a workbook for the first time, a **Save As** dialog box will appear.

2. Type the file name and choose a location to save the file. Notice that the file extension is **.ods**.

1.4 OPENING WORKBOOK AND ENTERING TEXT

In this section, we will learn how to open an already saved workbook. Also, how to enter data in a cell.

1.4.1 Opening a Workbook

The steps to open an already saved workbook are:

1. Select **Open** option from the **File menu**.

Or

Click **Open** icon on the **Standard bar**.

Or

Press **Ctrl + O**

2. The **Open** dialog box appears.
3. Select the drive and the folder from where you want to open the file.
4. Select the file and click **Open** button.

1.4.2 Entering text

To enter data in a cell,

1. Select the cell.
2. Type the content.
3. Press ENTER key.

You can enter numbers, text, and formulas in a cell. By default, the text is left-aligned in a cell and numbers are right-aligned.

	A	B	C
1	State	No. of Students	
2	Delhi	54000	
3	Haryana	46000	
4	Bihar	40000	
5	Punjab	42000	
6	Madhya Pradesh	52000	
7			
8			

Left-aligned

right-aligned

To cancel the data you have entered before pressing the ENTER key, press the ESC key.

1.5 RESIZE FONTS AND STYLES

We can always change the font, style and size of the text or data entered in a worksheet. This can be done before typing or after typing the content.

The options for formatting data/text are available on the **Formatting bar (Fig 4)**. The use of each of the options is shown in the figure.

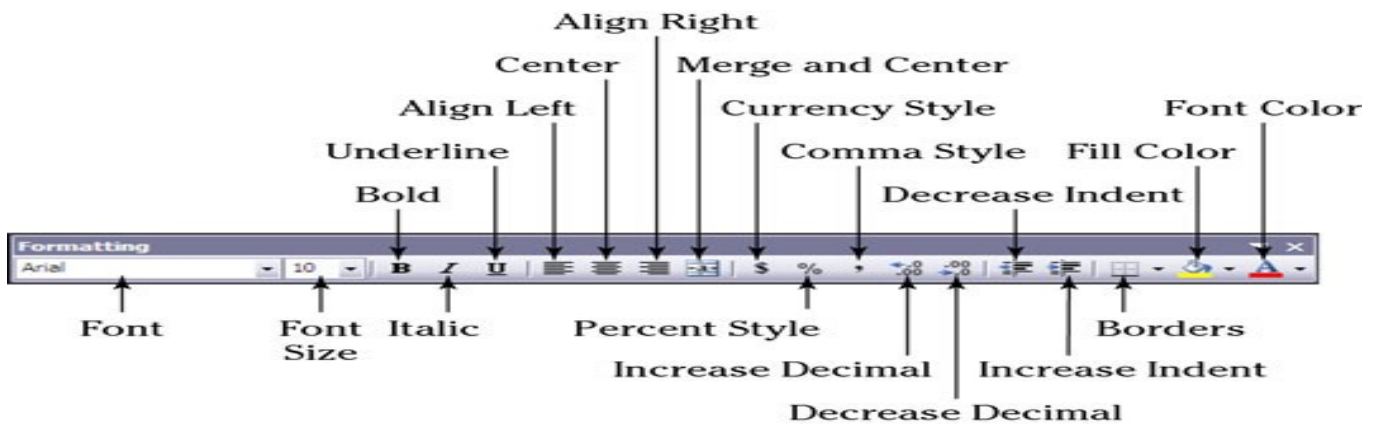


Fig. 4 Formatting bar

1.6 COPYING AND MOVING

In this section, we will learn how to select cells, rows, and columns. We will also discuss how to insert and delete cells, rows, and columns. How to change the row height and column width is also discussed here.

Before performing any operation, like, making text bold, changing text color, etc, on a range of cells, you need to select the range.

A **range** is a rectangular block of contiguous cells, i.e.,

cells that touch each other, especially along a line.

1.6.1 Selecting Cells

You can select range of cells in any one of the following ways:

- Using the mouse
- Using the keyboard

Using the mouse

To select a range of cells using the mouse, the steps are:

1. Click the cell you wish to start your selection from.
2. Click and hold the left mouse button down, drag the mouse

pointer to the diagonally opposite corner cell.

For example, if the range A1 to D3 is to be selected, place the

mouse pointer at cell A1. Hold the left mouse button down and

drag it to the cell D3. The range A1 to D3 is represented as A1:D3.

When you select the range, all the cells appear highlighted (**Fig. 5**).

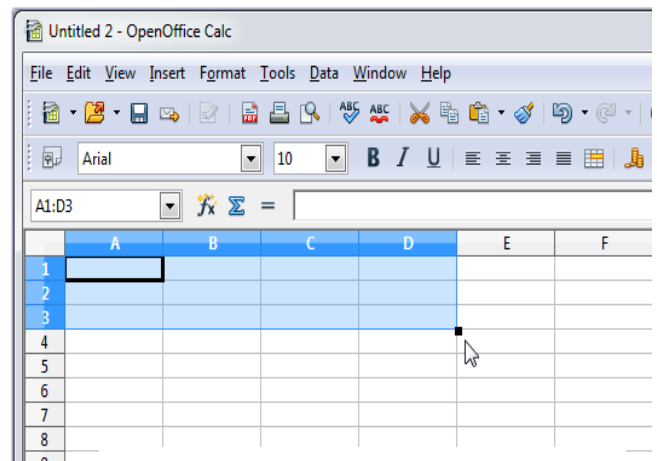


Fig 5 Selecting range using mouse

Using the Keyboard

To select a range of cells using the keyboard, the steps are:

1. Place the cell pointer at one of the corner cells of the range to be selected.
2. Press the SHIFT key and move to the diagonally opposite corner cell using the arrow keys.
3. Release the SHIFT key when the required range has been selected.

Selecting Multiple Ranges Simultaneously

To select multiple ranges, do the following:

1. Select the first range of cells.
2. Hold the **CTRL** key and select another range of cells.
3. Repeat step 2 to select more ranges if required (**Fig. 6**).

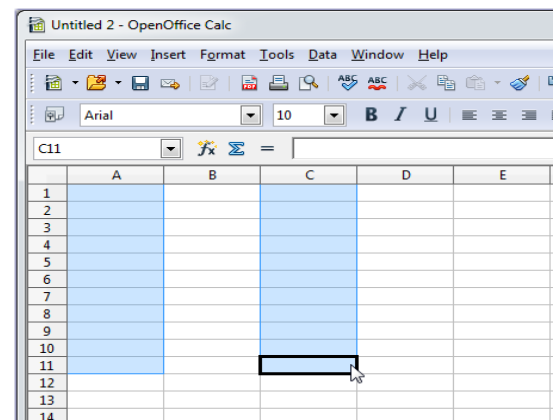


Fig 6 Selecting multiple range of cells

Selecting the entire row

To select the entire row in which the cell pointer is positioned, click the row heading.

Selecting the entire column

To select the entire column in which the cell pointer is positioned, click the column heading.

Selecting the entire worksheet

To select the entire worksheet:

Press CTRL + A

Or

Click the blank button (called the **Select All** button) at the junction of the row and column headers. (**Fig 7**)

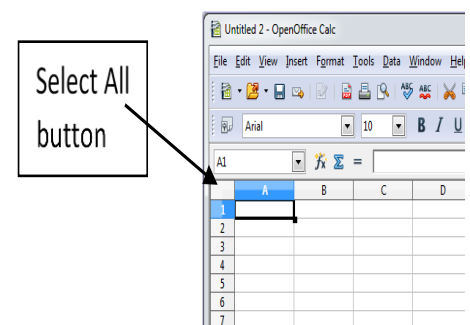


Fig 7 Select All button

Let's Try

Start OpenOfficeCalc and create a new worksheet. Now, try the following:

1. Select cell B3.
2. Select the range of cells from A1 to D3.
3. Select the range of cells from C5 to F5.
4. Select multiple range of cells B4:D7 and C4:F8.
5. Select row 5.
6. Select row 3 and 8.
7. Select column D.
8. Select column B and G.

Worksheet

1. By default, how many worksheets are there in a Calc workbook? _____
2. How are rows numbered in Calc? _____
3. Name the column after column Z. _____
4. What is the address of the cell formed by the intersection of 3rd column 5th row?

5. Name the cells in the range A2:B5. _____
6. How can you select entire worksheet using keyboard? _____
7. How can you select entire column number B? _____
8. Which key will you press if you want to select multiple ranges of cells? _____
9. Name the column after BZ? _____
10. What is the extension of a file saved in Calc?

1.6.2 Copying Cell Contents

You can copy content of cell(s) to another cell(s). To copy cell contents in Calc, the steps are:

1. Select the cell(s) that contain(s) the data you want to copy.
2. Select **Copy option** from the **Edit** menu.

Or

Click the **Copy** button on the **Standard** bar. (Fig 8)

Or

Press **CTRL + C** to copy the data.

3. Click on the cell(s) where you want to paste the data.
4. Select Paste option from the Edit menu.

Or

Click the **Paste** button on the **Standard** bar.

Or

Press CTRL + V.

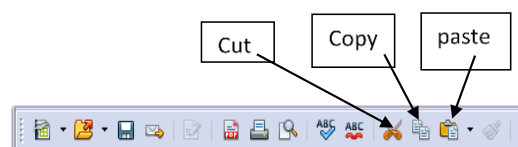


Fig 8 Standard bar

1.6.3 Moving Cell Contents

To move cell contents from one cell to another in Calc, the steps are:

1. Select the cell that contains the data you want to cut.
2. Select **Cut** option from the **Edit** menu.

Or

Click the **Cut** button on the **Standard** bar.

Or

Press CTRL + X to cut the data.

3. Click on the cell where you want to paste the data.
4. Select **Paste option** from the **Edit** menu.

Or

Click the **Paste** button on the **Standard** bar.

Or

Press CTRL + V.

1.6.4 Inserting and Deleting Cells

To insert cells, the steps are:

1. Select the range of cells where you want to insert a block of cells.
2. Select **Cells** option from the **Insert** menu.
3. The **Insert Cells** dialog box appears.
4. Select the appropriate option and click **OK**.

To delete cells, the steps are:

1. Select the range of cells where you want to delete a block of cells.
2. Select **Delete Cells** option from the **Edit** menu.
3. The **Delete Cells** dialog box appears.
4. Select the appropriate option and click **OK**.

1.6.5 Inserting Rows and Columns

The steps to insert rows are:

1. Select the row where you want to insert a new row.
2. Select **Rows** option from the **Insert** menu.

Or

Right-click the row header and select **Insert Rows** in the shortcut menu.

A new row is inserted above the selected/highlighted row.

Cells in the new row are formatted similar to the corresponding cells in the row before which the new row is inserted.

Multiple rows can be inserted at once by selecting multiple rows using the CTRL key or by dragging the mouse while holding down the left mouse button.

To insert columns, the steps are:

1. Select the column where you want to insert a new column.
2. Select **Columns option** from the **Insert menu**.

Or

Right-click the column header and select **Insert Columns** in the shortcut menu.

When you insert a new column, it is inserted to the left of the selected/highlighted column. Cells in the new column are formatted similar to the corresponding cells in the column to the left of which the new column or row is inserted.

Multiple columns can be inserted at once by selecting multiple columns using the CTRL key or by dragging the mouse while holding down the left mouse button.

1.6.6 Deleting Rows and Columns

To delete rows, the steps are:

1. Select the row to be deleted.
2. Right-click on the selected row header.
3. Select **Delete Rows** option in the shortcut menu.

To delete multiple rows, select them using the CTRL key, or by dragging the mouse while holding the left mouse button.

To delete columns, the steps are:

1. Select the column to be deleted.
2. Right-click on the selected column header.
3. Select **Delete Columns** in the shortcut menu.

To delete multiple columns, select them using the CTRL key, or by dragging the mouse while holding the left mouse button.

Deleting Content

Instead of deleting a row or column, you may want to delete the contents of the cells but keep the empty row or column. This can be done in the following manner:

1. Select the cell(s), the contents of which you want to delete.
2. Press the DELETE key.

Or

Select **Delete Contents** option of **Edit** menu.

3. The **Delete Contents** dialog box appears.

3. Check the boxes of the kind of data you want to delete (e.g., checking **Formats** will remove the formatting changes such as bold, italics, font colors, and borders).

4. Click **OK**.

1.6.7 Changing Row Height and Column Width

You can change the row height in a Calc worksheet in any of the following ways:

- Drag the divider below the row (**Fig 9**).
- To fit the row height to the cell contents, double-click the divider.
- Select **Format** > **Row** > **Height**. The **Row Height** dialog box appears (**Fig. 10**). Enter the value for row height in the **Height** spinbox. Click **Ok** button.

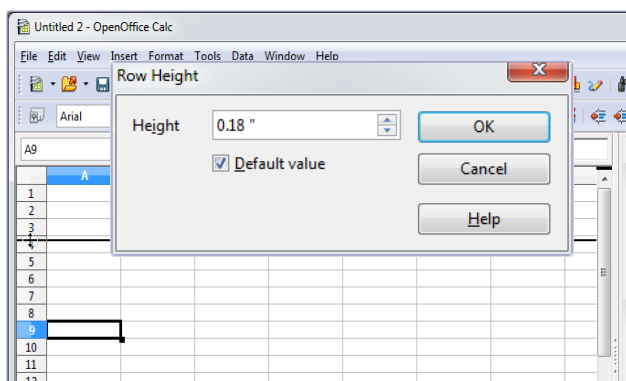


Fig 9 Change Row Height dialog box

Changing Column Width

You can change the column width in a Calc worksheet in any of the following ways:

- Drag the divider to the right of the column header (**Fig 11**).
- To fit the column width to the cell contents, double-click the divider.
- To change the column width, select **Format > Column > Width**. The **Column Width** dialog box appears. Enter the value for column width in the **Width** spinbox. Click Ok button.

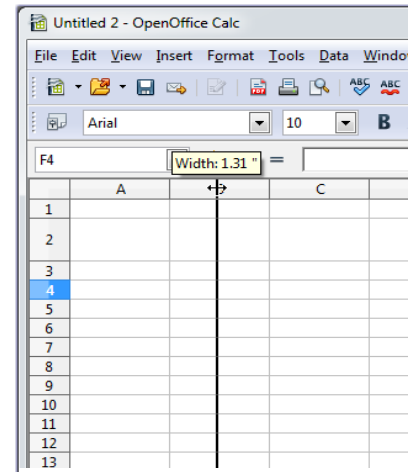


Fig 11 Changing column width

Let's Try

1. Create the following worksheet.

	A	B	C	D	E	F	G
1	Roll No	Name	English	Hindi	Science	Maths	
2	1101	Arpit	67	56	45	56	
3	1102	Keerath	77	66	70	67	
4	1103	Saksham	78	72	68	66	
5	1104	Suhail	67	68	72	71	
6	1106	Tarun	44	55	59	62	
7							

2. Insert a column after column D.
3. Move the marks of Maths in the newly inserted column.
4. Insert a new row after row 5.
5. Insert the following details in the new row
1105 Tiya 69 64 59 54
6. Change the row height of all the rows.
7. Change the column width of columns A to F.

1.7 FILTER AND SORTING

1.7.1 Filtering Data

Filtering is a quick and easy way to find and work with selected data based on the criteria you specify. The filter feature selectively blocks out the data you do not want to see and displays only the rows or columns that meet the conditions or criteria you specify. Sorting rearranges the range of cells but filtering only hides temporarily the rows/columns you do not want.

Different ways in which filtering can be done in Calc are:

- AutoFilter
- Standard Filter

AutoFilter

To apply AutoFilter in a worksheet, the steps are:

1. Select cell, say, A1.
2. Select **Data** ➤ **Filter** ➤ **AutoFilter**.
3. A drop-down menu arrows appear in each column heading (**Fig 12**).
4. Click the drop-down menu arrow for **Total Sales** and select an item (**Fig 13**).
5. Only those rows whose contents meet the filter criteria are displayed.
 - a. To display all the records again, select the **All** option in the filter drop-down menu.
 - b. Select **Top 10** to display the highest 10 values.

	A	B	C	D
1	Salesman No	Salesman Name	Total Sale	
2	S6	Madan	5467	
3	S7	Sooraj	4563	
4	S3	Sudesh	4455	
5	S1	Abhijeet	2345	
6	S4	Rohit	3456	
7	S5	Deepak	4563	
8	S2	Farhan	5467	
9				
10				
11				

Fig. 12 Drop-down menu arrows in column Headings

Fig. 13 Drop-down menu for Total

Standard Filter

To apply standard filter in your worksheet, the steps are:

1. Select **Data** ➤ **Filter** ➤ **Standard Filter**.
2. The **Standard Filter** dialog box appears (**Fig. 14**).
 - a. You can use the dialog box to connect multiple conditions with either a logical AND or a logical OR operator.
3. Select the options in the **Standard Filter** dialog box. The records with Total Sales greater than 4000 will be displayed (**Fig. 15**).

Operator	Field name	Condition	Value
>	Total Sale	>	4000
- none -	- none -	=	
- none -	- none -	=	
- none -	- none -	=	

Fig. 14 Standard Filter dialog box

	A	B	C	D
1	Salesman No	Salesman Name	Total Sale	
2	S6	Madan	5467	
3	S7	Sooraj	4563	
4	S3	Sudesh	4455	
9				
10				
11				

Fig. 15 Rows after applying Standard Filter

To remove the filter,

1. Select **Data** ➤ **Filter** ➤ **Remove Filter**.

To hide the filter,

1. Select **Data** ➤ **Filter** ➤ **Hide AutoFilter**.

To remove the filter from column headings,

1. Select **Data** ➤ **Filter** ➤ **AutoFilter**.

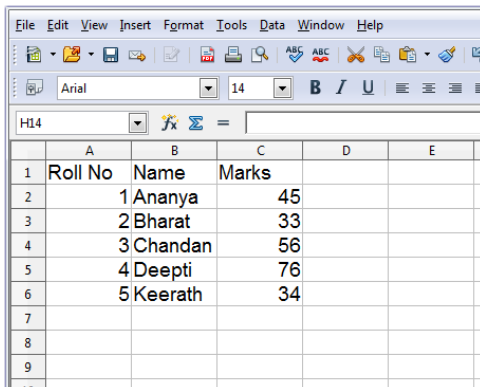
1.7.2 Sorting Data

Once you have entered data and applied relevant formulas in a worksheet, you can arrange the data in ascending or descending order. This is called sorting of data.

Sorting on numerical and textual values is a one of the main features of any spreadsheet software. In Calc, sorting can be done in the following manner.

Sorting on One Column

1. Enter data in a worksheet (**Fig. 16**).
2. Select any cell, say C1.
3. Click the **Sort** option from the **Data** menu (**Fig. 17**)



	A	B	C	D	E
1	Roll No	Name	Marks		
2	1	Ananya	45		
3	2	Bharat	33		
4	3	Chandan	56		
5	4	Deepti	76		
6	5	Keerath	34		
7					
8					
9					
10					

Fig. 16 Data in worksheet

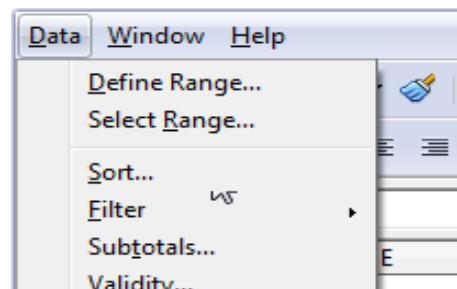


Fig. 17 Sort option in the Data menu

3. The **Sort** dialog box appears (**Fig. 18**). Notice that column **Marks** appears under **Sort by** section.

4. Select the **Descending** option under **Sort by** and click **OK**.

5. The data in column **Marks** is sorted in descending order. (**Fig 19**)

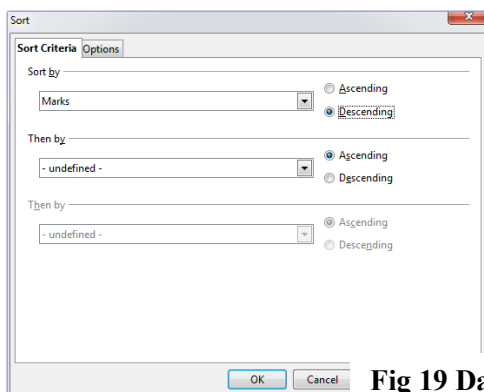
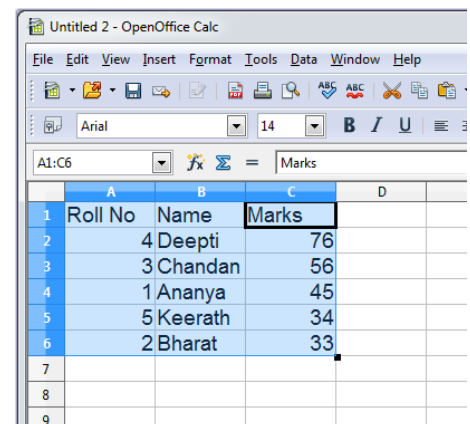


Fig 19 Data arranges in descending order of Marks



	A	B	C	D
1	Roll No	Name	Marks	
2	4	Deepti	76	
3	3	Chandan	56	
4	1	Ananya	45	
5	5	Keerath	34	
6	2	Bharat	33	
7				
8				
9				

You can also sort the data on one column is by using the sortii
On the **Standard** bar, click (**Fig 20**)

- The **Sort Ascending** button to sort the data in ascending order.
- The **Sort Descending** button to sort the data in descending order.

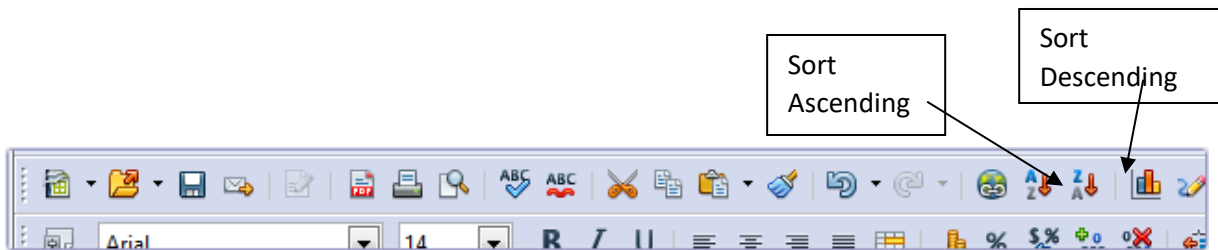


Fig 20 Sort buttons on Standard bar

Sorting on Multiple Columns

You can sort the data on multiple columns.

1. Consider the following worksheet. (**Fig 21**)
2. Select cell, say C1.
3. Select **Sort** option from **Data** menu.
4. The **Sort dialog** box appears.
5. The **Sort Criteria** tab on the **Sort dialog** box

has options to sort the data on multiple columns.

6. Select the options as shown in **Figure 22**.
7. The data is sorted in descending order of column

Total Sale, and where total sale is same, sorting is done in ascending order of column **Salesman Name**. (**Fig 23**)

	A	B	C	D	E
1	Salesman No	Salesman Name	Total Sale		
2	S1	Abhijeet	3456		
3	S2	Farhan	2345		
4	S3	Sudesh	4455		
5	S4	Rohit	3456		
6	S5	Deepak	2345		
7	S6	Madan	5467		
8	S7	Sooraj	4563		
9					
10					
11					

Fig 21 Worksheet

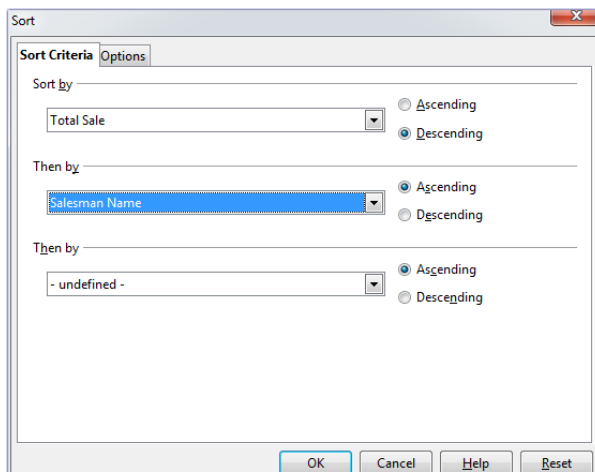


Fig. 22 Multiple columns selected in the Sort dialog box

	A	B	C	D	E
1	Salesman No	Salesman Name	Total Sale		
2	S6	Madan	5467		
3	S7	Sooraj	4563		
4	S3	Sudesh	4455		
5	S1	Abhijeet	3456		
6	S4	Rohit	3456		
7	S5	Deepak	2345		
8	S2	Farhan	2345		
9					
10					
11					

Fig 23 Data sorted on multiple columns

Lets Try!

1. Create the following worksheet and perform the following operations:

	A	B	C	D
1	S. No	Mountain	Height in mm	
2	1	Mount Manaslu	8163	
3	2	Mount Everest	8848	
4	3	Mount kanchenjunga	8586	
5	4	Mount K2	8611	
6	5	Nanga Parbat	8125	
7				
8				
9				

- a. Sort the table in ascending order of height.
- b. Filter the data to view only those rows where height is more than 8500 m.

1.8 FORMULAS AND FUNCTIONS

The most important feature of Spreadsheet software is that you can perform arithmetic operations on the data in a worksheet.

1.8.1 Formulas

Formulae are used to calculate results through arithmetic operations.

A formula in Calc always starts with an **equal to (=)** sign. If you forget to put = sign before the formula, it will be treated as text and no calculation will be performed. Also, you should not write anything before the = sign. Again it will be treated as text and no calculation will be performed.

The data in a formula consists of one or a combination of the following:

Value Numeric (e.g., 45) or string (e.g., "Smiling")

Cell Address B4, A2:C6

Function SUM, AVERAGE, MIN, MAX, etc.

Operator +, -, *, /, >, =, etc.

Parenthesis To control the left to right order of precedence in a formula (e.g., $= (B2*B3)*2$)

<A>Numeric Formulae

In numeric formulae, you have to make use of operators. The results are calculated based on the order of precedence of the operators.

Mathematical Operators Used in Formulae

The mathematical operators used in Calc and their order of evaluation in formulae is given below:

Operation	Operator	Order of evaluation	Formula	Result
Exponent	^	1	$= 2 ^ 3$	8
Multiplication	*	2	$= 3 * 5$	15
Division	/	2	$= 9 / 3$	3
Addition	+	3	$= 12 + 15$	27
Subtraction	-	3	$= 18 - 15$	3

Order of evaluation

1. Any operation contained within brackets will be carried out first

2. Then any exponent.
3. Then follow division and multiplication operations. Multiplication and division are given equal importance. They are carried out in the order they occur in the formula, from left to right. Whichever appears first in the formula is carried out first.
4. After that, addition and subtraction operations are given equal importance. They are also carried out in the order they occur in the formula, from left to right.

Following are some examples of how Calc evaluates formulae.

Formula	Output
= (3 + 7) * 2	20
= 4 * 3 + 5	17
= 3 + 3 ^ 2	12
= 5 + 3 * 4 - 2	15
= 6 + 14/2 * 3 - 4	23

<C>Error Results

Sometimes a formula displays an error result rather than a proper value. This happens when the formula or data has a problem and Calc cannot evaluate it.

Some common errors are shown below:

Error	Reason
#####	The column is not wide enough to display the value.
#DIV/0!	The formula contains an invalid operation, i.e., division by zero.
#VALUE!	The formula has invalid argument, e.g., text in a cell where numeric value is required.

<D>Text Formulae

A text string or a text value is a sequence of characters. You can join two strings together. This is called concatenation. We use the ampersand (&) character to concatenate strings.

For example, if you type = "Keep" & " & "Smiling" in a cell and press **ENTER**, you will see the result as **Keep Smiling**.

You cannot do operations such as subtraction, multiplication, and division on strings.

<E>Cell and Range References

A cell **reference** identifies a cell or a range of cells. Each cell in the worksheet has a unique address formed by the combination of its intersecting row and column. When a cell address is referred to in a formula, it is called **cell referencing**.

Consider the following examples:

Cell or a Range of Cells	Reference
The cell in column B and row 4	B4
All cells in row 5	5:5
All cells in rows 5 through 9	5:9
All cells in column B	B:B
The range of cells in column F and rows 1 through 7	F1:F7
The range of cells in row 5 and columns C through E	C5:E5
All cells in columns C through G	C:G
The range of cells in columns B through G and rows 4 through 8	B4:G8

<F>Entering A Formula

All formulae in OpenOfficeCalc begin with an **equal to (=)** sign. A formula can contain number, text, arithmetic operators (+, -, *, /), or functions. The order of precedence is already discussed.

To enter a formula:

1. Select the cell and enter the formula directly in the cell or in the Formula Bar.
2. Press the Enter key.
3. The cell will show the result of the formula and the formula itself. You can see the formula in the Formula bar when the cell is selected.

Consider the following worksheet.(Fig 24)

	A	B	C	D	E
1	Student Result				
2	Roll NO	English	Hindi	Total	
3	1	67	73		
4	2	77	78		
5	3	56	65		
6	4	72	79		
7					
8					
9					
10					

Fig 24 Worksheet

To find the total marks:

1. Select cell D3.
2. Type the formula =B3+C3.
3. To copy this formula in other cells:
 - a. Select cell D3.
 - b. Click the AutoFill handle and drag till

cell D6. (Fig 25)

- c. The formula copied in cell D4 will be =B4+C4.
- d. The formula copied in cell D5 will be =B5+C5.
- e. The formula copied in cell D6 will be =B6+C6.

	A	B	C	D	E
1	Student Result				
2	Roll NO	English	Hindi	Total	
3	1	67	73	140	
4	2	77	78	155	
5	3	56	65	121	
6	4	72	79	151	
7					
8					

Fig 25 Copying formula

Let's Try

1. Create the following worksheet.

	A	B	C	D	E
1	Num1	Num2	Num3	Total	
2	45	67	77		
3					
4					
5					

2. Now, type the formula $=45+67+77$ in cell D2. Press Enter key.
3. Now change the value 88 in cell C2.
4. Did you notice any change in the cell D2?
5. Now, type the formula $=A2+B2+C2$ in cell D2 and press Enter key.
6. Notice the result in cell D2.
7. Now, change the value in cell A2 to 89.
8. Notice the change in cell D2.
9. Notice the benefit of giving cell address in a formulae.

Let's Try

Create the following worksheet in Calc.

	A	B	C	D	E
1	Area and Perimeter of Rectangle				
2	Length (in cm)	Breadth (in cm)	Area (in sq. cm)	Perimeter (in cm)	
3	12	8			
4	15	7			
5	13	6			
6					
7					

1. Write the formula to calculate area of a rectangle in cell C3 ($=A3*B3$). Then press Enter key.
2. To copy the formula to cells C4 and C5:
 - a. Select cell C3.
 - b. Click and drag the AutoFill handle to cells C4 and C5.
3. Write the formula to calculate perimeter of rectangle in cells D3 ($=2*(A3+B3)$). Then press the Enter key.
4. Now, copy the formula in cell D3 to D4 and D5.
5. Save the worksheet as 'rectangle'.

Let's Try

1. Open the file 'rectangle'.
2. Change the values of length and breadth in cells A3, A4, B3 and B4.
3. Observe the change in the results in cells C3, C4, D3 and D4.

Let's Try

Create the following worksheet and perform the following operations

	A	B	C	D	E	F	G	H
1	Student Result							
2	Roll No	Name	English	Hindi	Maths	Science	Social Science	
3	1	Pratham	74	45	44	65	56	
4	2	Keerath	68	56	60	67	62	
5	3	Shreya	56	67	56	55	59	
6	4	Jigyasa	45	55	44	56	58	
7	5	Utkarsh	67	70	48	63	61	
8								
9								

- Filter the records according to the following condition:
- Add another column at the end with heading 'Total marks'
- Calculate total marks for each student.
- Now, arrange the data in descending order of Total marks.

1.8.2 Using Functions to do calculations

Functions are predefined formulae that perform calculations using specific values called arguments.

The format of writing any function in Calc is:

=function_name(Argument1;Argument2; Argument3;.....)

Arguments These are the values passed to a function so that the function carries out the intended calculation or manipulation to give results. Arguments can be constants, formulae, or function.

<A>SUM

You have already learnt how to find total using the formula. You can also obtain the sum of the values in a range of cells by:

- Clicking the **Sum** button on the **Formula** bar (Fig 26)
- Using the **SUM()** function

SUM function is used to find total of numbers in a range of cells.

For example:

Formula

=SUM(5;6;12)

=SUM(A1;B1;C1) where A1, B1

and C1 contain the values 12, 23

and 14 respectively

Result

23

49

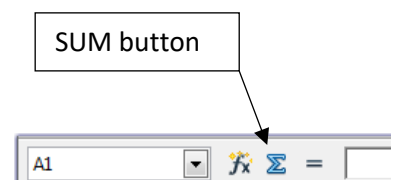


Fig 26 Formula bar

Let us consider an example.

1. Consider the worksheet shown in **Figure 27**.

	A	B	C	D	E	F
1	Roll No	Term I	Term II	Total		
2	1	45	56			
3	2	67	70			
4	3	45	68			
5	4	67	67			
6	5	56	67			
7	6	45	56			

Fig 27 Creating a worksheet

	A	B	C	D	E	F
1	Roll No	Term I	Term II	Total		
2	1	45	56	=SUM(B2:C2)		
3	2	67	70			
4	3	45	68			
5	4	67	67			
6	5	56	67			
7	6	45	56			

Fig 28

2. Select the cell D2.
3. Click the **Sum** button on the **Formula** bar. Notice it will select the range A2:C2. (**Fig 28**).
4. Select the correct range B2:D2 or type the correct range (**Fig 29**).

	A	B	C	D	E	F
1	Roll No	Term I	Term II	Total		
2	1	45	56	=SUM(B2:C2)		
3	2	67	70			
4	3	45	68			
5	4	67	67			
6	5	56	67			
7	6	45	56			

Fig 29

	A	B	C	D	E	F
1	Roll No	Term I	Term II	Total		
2	1	45	56	101		
3	2	67	70			
4	3	45	68			
5	4	67	67			
6	5	56	67			
7	6	45	56			

Fig 30

5. Press ENTER (**Fig. 30**) to perform the operation. The sum of the range B2:C2 will appear in cell D2.

6. Select cell D2 and using the AutoFill handle, drag the formula through D7. The respective sums will appear in the respective cells. (**Fig 31**)

	A	B	C	D	E	F
1	Roll No	Term I	Term II	Total		
2	1	45	56	101		
3	2	67	70	137		
4	3	45	68	113		
5	4	67	67	134		
6	5	56	67	123		
7	6	45	56	101		

Fig 31

AVERAGE Function

Average function is used to find the average of numbers in a range of cell.

For example:

Formula

=AVERAGE(3;6;9)

=AVERAGE(A1;B1;C1)

where A1, B1 and C1 contain the values 4, 5 and 6 respectively

Result

6

5

<C>COUNT Function

The COUNT function is used to count the number of numeric values in a range of cells.

For example:

Formula	Result
=COUNT(5;8;14;19)	4
=COUNT(A1:A10)	

<D>MAX Function

The MAX function is used to find the maximum of numbers in a given range of cells.

For example,

Formula	Result
=MAX(74;102;134)	134
=MAX(A1;B1;C1)	
Or	
=MAX (A1:C1)	6
where A1, B1 and C1 contain the values 4, 5 and 6 respectively	

<E>MIN Function

The MIN function is used to find the minimum of values in the given range of cells.

For example;

Formula	Result
=MIN(74;102;134)	74
=MIN(A1;B1;C1)	
Or	
=MIN (A1:C1)	4
where A1, B1 and C1 contain the values 4, 5 and 6 respectively	

Worksheet

1. Every formula in Calc starts with which symbol? _____
2. The formula in cell B6 is '=MIN(B1:B5)'. When copied to C6, the formula changes to _____.
2. If A1:A4 contains the numbers 11, 13, 15, 17, the formula =AVERAGE(A1:A4) in cell A5 will display _____.
3. Cell B1 contains 12 and C1 contains 8. What will be the content of cell D1, if the formula =B1*C1/2 is entered in cell C1? _____
4. The contents of cell B2, C2, D2, and E2 are 13, 15, 17, 19 respectively. What will be the value in cell E2, if the formula =MAX(B2:E2) is entered in cell E2? _____
5. What is the difference between MAX and MIN functions in Calc?

1.9 PASSWORD PROTECTION

In OpenOffice Calc, you can protect your spreadsheet with a password. To protect your data, you can either assign a password to a sheet or Calc document. This can be done using Tools menu and also while saving the document.

1.9.1 Using Tools menu

The steps to protect worksheet or Calc document using option of Tools menu are:

1. Select **Tools menu** ➤ **Protect document** Choose whether to protect **Sheet** or **Document**. (**Fig 32**).
2. If you select **Sheet**, the **Protect Sheet** dialog box appears. (**Fig 33**).

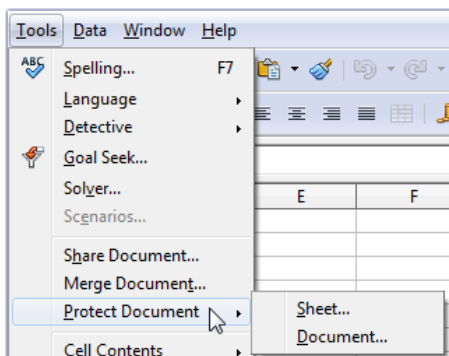


Fig 32 Tools menu

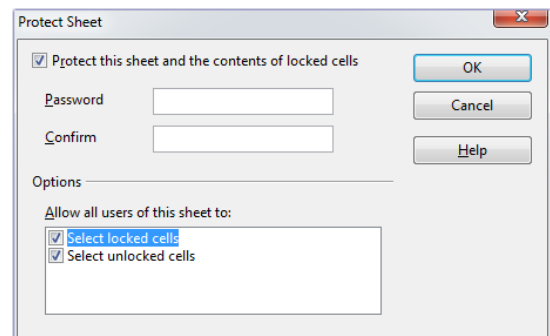


Fig 33 Protect Sheet dialog box

If you select **Document**, the protect **Document** dialog box appears.

3. Type the password in **Password text box**. Again type the password in **Confirm text box**. Note that the password is case sensitive.
4. Click **OK** button.

Undoing Password Protection

To remove a password, open the document, then save without password

Tip

Rules to select a password:

- Length of 8 or more characters
- Mix of lowercase and uppercase letters, numbers and special characters

1.9.2 Protecting Calc document while Saving

You can also protect your spreadsheet with a password while saving the document. The steps are:

1. Select **Save As** option from **File menu**.
2. The **Save As** dialog box appears. Select the drive and the folder where you want to save the file.

3. Select **Save with password** check box. (Fig 34)

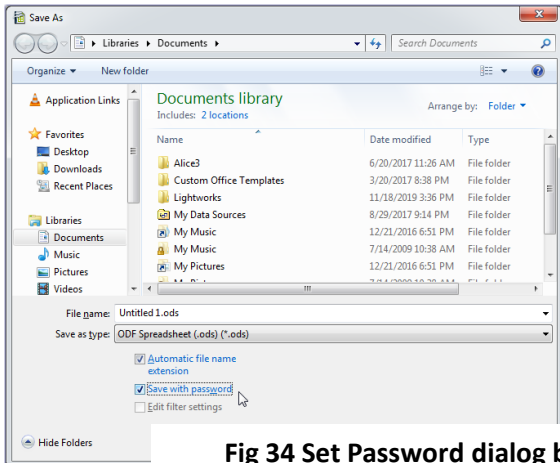
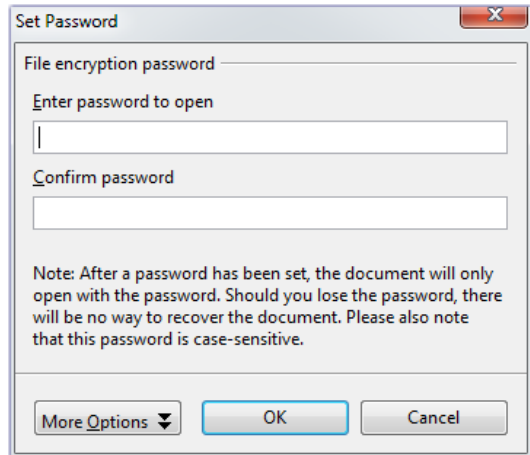


Fig 34 Set Password dialog box



4. Click **Save** button.
5. The **Set Password** dialog box appears. (Fig 35)
6. Enter the password to open. Again type the password in **Confirm password** text box.
7. Next, click on **More options**. The dialog box expands as shown below in **figure 36**.

8. Here, you can give file sharing password. You can select the check box of **Open file read-only** option, if you want the recipient to only read the file and make no changes. You can also enter password to allow editing.
9. Click **OK** button.

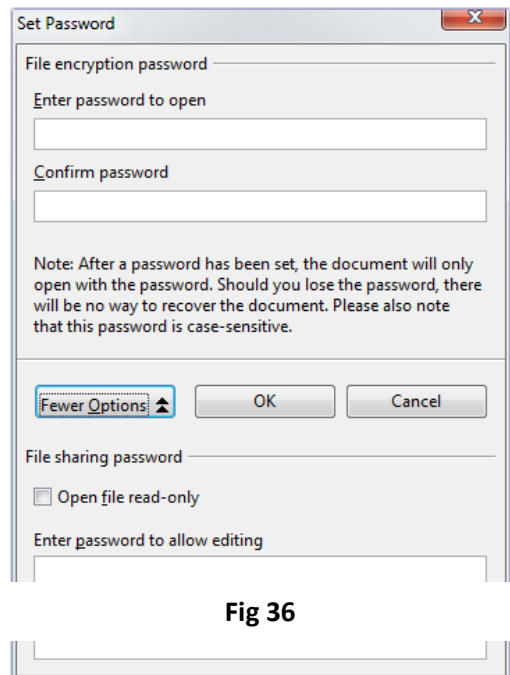


Fig 36

1.10 PRINTING A SPREADSHEET

Select **File > Page Preview** to view a worksheet so as to get an idea of how it will look when printed.

or

Click the **Page Preview** button on the **Standard** bar (Fig 37).

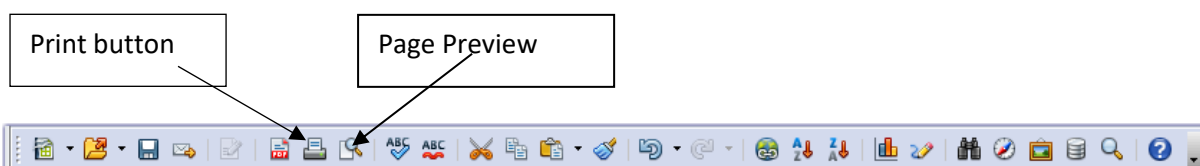


Fig 37

To print a worksheet, the steps are:

1. Click **File** ➤ **Print**.
2. The **Print** dialog box will appear (**Fig. 38**).
3. Select the printer, the range to be printed, and the number of copies.
4. Click the **Print** button.

To quickly print without getting the **Print** dialog box, click the **Print** button on the **Standard** bar. (**Fig 37**)

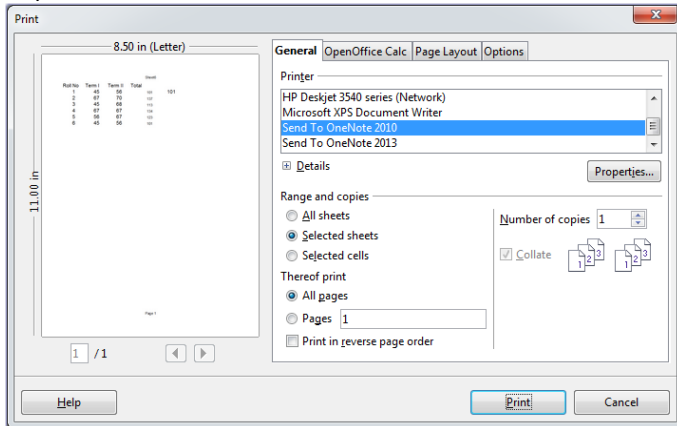


Fig. 38 Print dialog box

Lets Try it

4. Create the following worksheet and perform calculations using functions in Calc.

	A	B	C	D	E	F	G	H	I
1	Student Result								
2	Roll No	Name	English	Hindi	Maths	Science	Social Science	Total	
3	1	Saurabh	67	75	56	66	70		
4	2	Madhur	76	67	60	67	62		
5	3	Tamana	68	66	56	58	60		
6	4	Stuti	70	68	54	62	64		
7	5	Girish	62	70	68	64	68		
8									
9	Maximum								
10	Minimum								
11									
12									
13									

Lets Try it

1. Create the following worksheet and calculate total and percentage for each student.

	A	B	C	D	E	F	G	H	I
1	Student Result								
2	Roll No	Name	English	Hindi	Maths	Science	Social Science	Total	Perce
3	1	Jatin	67	75	56	66	70		
4	2	Shreya	76	67	60	67	62		
5	3	Sooraj	68	66	56	58	60		
6	4	Kamal	70	68	54	62	64		
7	5	Sanjana	62	70	68	64	68		
8									
9									
10									

2. Create the following worksheet. Calculate area and perimeter of square.

	A	B	C
1	Area and perimeter of a Square		
2	Side of a Square (in cm)	Area in Sq. Cm	Perimeter in cm
3	4		
4	8		
5	12		
6	23		
7			
8			
9			

3. Create the following worksheet. Calculate area and perimeter of rectangle.

	A	B	C	D
1	Area and perimeter of rectangle			
2	Length in cm	Breadth in cm	Area in sq. cm	Perimeter in cm
3	12	5		
4	10	4		
5	14	6		
6	13	8		
7				
8				
9				

Worksheet

1. How will you refer to a cell in column B and row 3?
2. How will you refer to range of cells in row 5?
3. How will you refer to range of cells in column D through F and rows 3 through 8?
4. Write mathematical operator for the following operation:
 - a. Multiplication
 - b. Division
5. If formula in cell C3 is =A3+B3, what formula will be copied in cell D3?
6. How will you write a function to find average of numbers 5, 12, and 17?
7. Name the function used to find total of numbers in the range of cells A1 to A10.
8. Name the menu used to print the document.
9. What error will you get if the column is not wide enough to display the value?
10. What happens if you write the formula =45/0 in cell A1?

1.11 SAVING A SPREADSHEET IN VARIOUS FORMATS

We have already learnt how to save a document in OpenOffice Calc. The default extension of a Calc file is .ods.

1.11.1 Saving in Microsoft Excel Format

If you want to save the file in the Microsoft Excel file format, then do the following while saving:

1. Select Save As option from the File emnu.
2. The Save As dialog box appears. (**Fig 39**)
3. Change the **Save as type** to Microsoft Excel 97/2000/XP(.xls).
4. Delect the drive and the folder where you want to save the file.
5. Type the filename and clcik Save button.

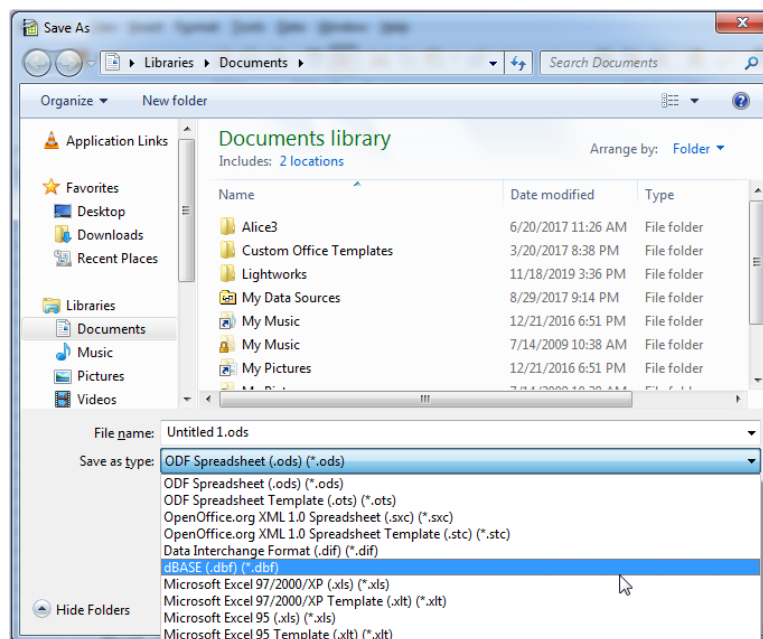


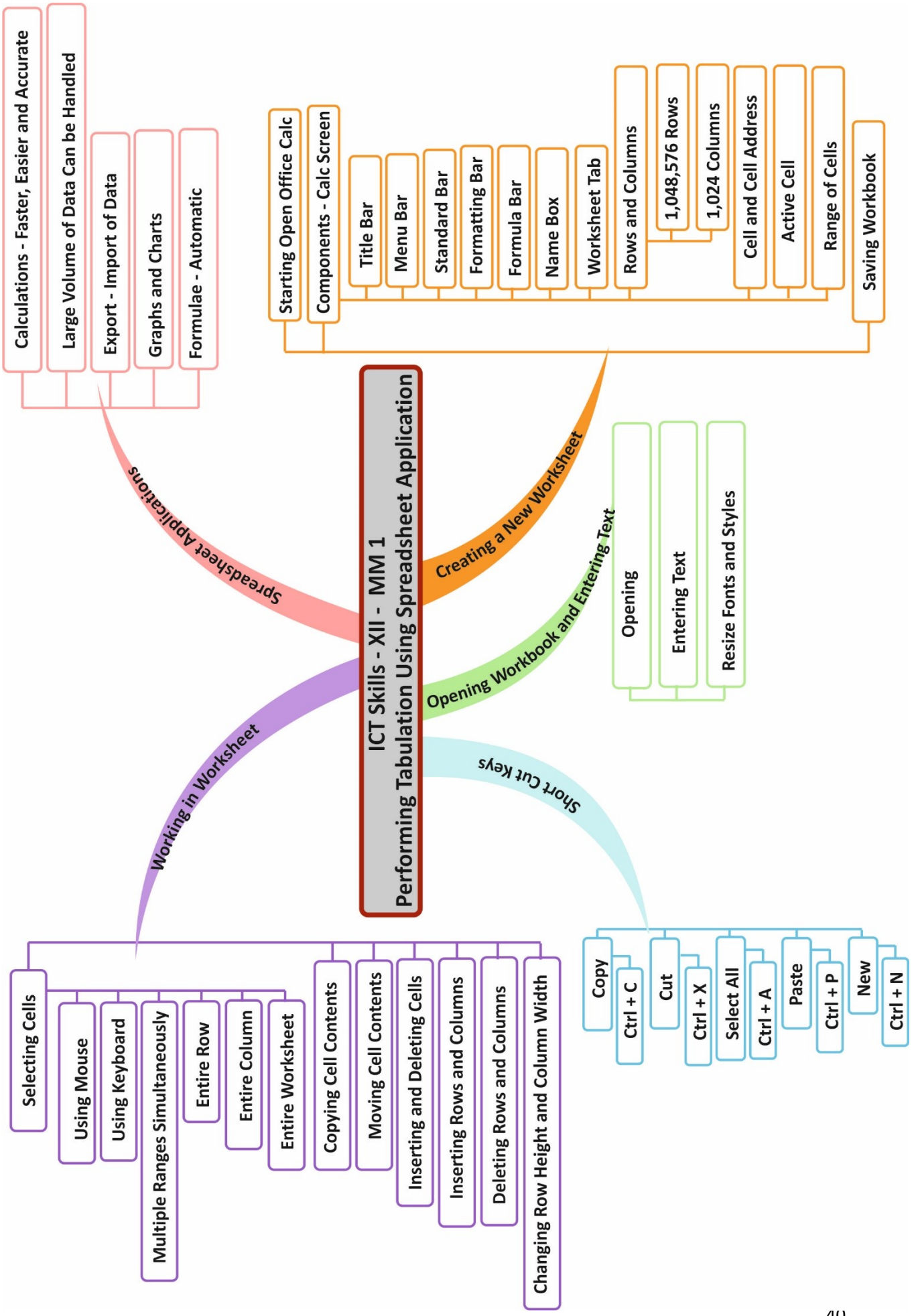
Fig 39 Save AS dialog box

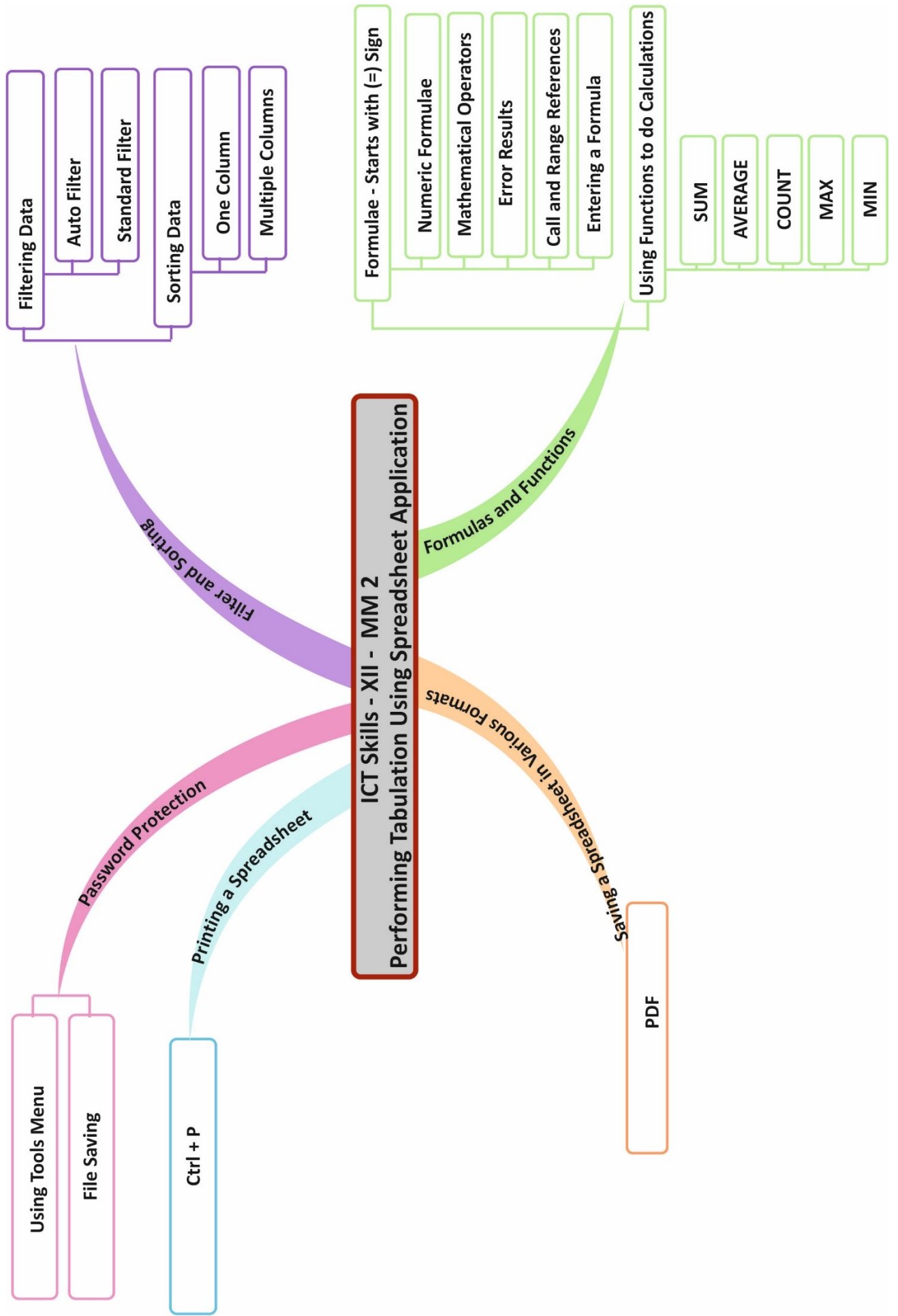
1.11.2 Saving in PDF format

Sometimes, when saving a document, you do not want the recipient to modify it. The safest way is to save the document in PDF (Portable Document Format) format and then share it. The simplest way to do this is:

1. Click on the **Export Directly as PDF** icon  on the **Standard bar**. This will export the entire document using the default PDF settings.
2. The **Export dialog** box appears.
3. Select the drive and the folder where you want to save the file.
4. Type the file name and click **OK** button.







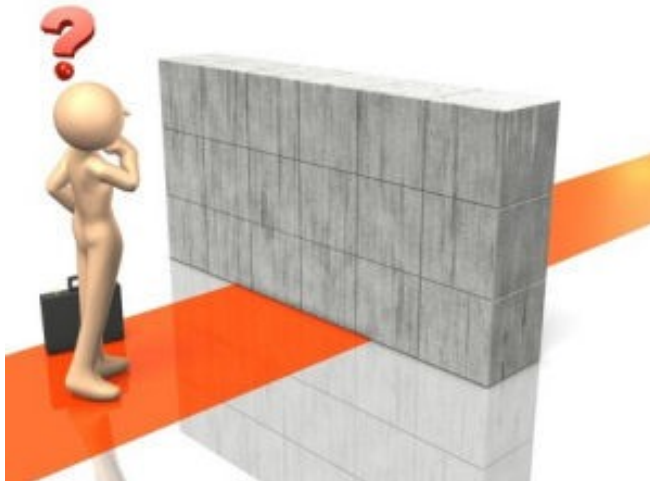
1. Introduction

All entrepreneurs are different but there are some characteristics and qualities that have been observed to be common among successful entrepreneurs over the years. Along with the qualities and traits, the motivation to choose the path of entrepreneurship as well as the journey to success is also different for each entrepreneur. However, one thing that drives all entrepreneurs is the sense of purpose behind their venture as well as willingness to take the leap and implement their ideas. More than anything, most entrepreneurs follow a basic process of entrepreneurship to kick start their ventures.

2. Barriers to Becoming an Entrepreneur

To launch a new venture, just recognizing a need or having an idea of how to fill the gap or need, are not strong enough basis. Entrepreneurs must be aware of the barriers to entry of the industry before they create a business plan, borrow capital or create the product. In depth market and industry analysis can make an entrepreneur aware of barriers to entry.

2.1 Unsupportive business environment: Business environment and ecosystem can be unsupportive due to cartelization, government regulations, corruption, bribery, bureaucracy etc. This can serve as a barrier to entrepreneurship as a supportive business environment is needed for the business to thrive. For example, Russia lacks rule of law, allows rampant corruption and bribing, enforces regulations inconsistently, allows regulatory authorities and inspectors to act in a predatory nature. All these factors make the business environment in Russia highly unsupportive.



2.2 Market entry regulations: Taxation, governmental rules, licensing mandates, environmental regulations, lending needs can all be barriers towards venture creation. In many industries, licensing is required for creating a new firm and entering the market. Tax disadvantages, lack of property rights and predatory tax behaviour also serve as barriers for market entry.

2.3 Shortage of capital: Capital or funding is required for any business to develop products/services, organize factors of production, train employees, market and sell etc. In many cases, especially in developing countries, shortage of funds or difficulty in finding the right investor or lender to start and run an enterprise, serves as a huge barrier to entrepreneurship.

2.4 Skilled workforce challenges: Employees form the heart of the business. One of the most crucial but overlooked tasks in a business is to build a skilled employee asset base. Lack of appropriate

practical and technical skills, lack of qualified employees, employee turnover, changes in labour laws, increase in employee's financial expectation etc. create barriers towards entrepreneurship and smooth functioning of the business.

2.5 Lack of Entrepreneurial Mindset & Training: Entrepreneurial mindset about having entrepreneurial skills, willingness to initiate new ventures, motivation to persist in challenging times and adapting to change. If this mindset is discouraged in any manner in any culture, then that itself is a barrier to entrepreneurship. Similarly, lack of entrepreneurship or related training and education can be a barrier in success of entrepreneurial activity. Training in managerial, technical and entrepreneurial skills is beneficial and important for budding entrepreneurs and early employees.

2.6 Risk Aversion: Entrepreneurs have to decide whether to take action so they don't miss the boat, while knowing that hasty action may cause them to sink the boat. Risk is a part of every business and if people from a country/region/culture are risk averse, then that can be a barrier to entrepreneurship. As entrepreneurs, it is important to take the plunge, accept failure, take risks etc.

2.7 Fear as a barrier

Fear is defined as an unpleasant feeling triggered by the perception of danger, real or imagined. In human psychology, fear is seen as an emotion as feeling fear helps to avoid calamity but at the same time it can also hold one back. In the process of entrepreneurship, fears are like obstacles. It is important for an entrepreneur to acknowledge his/her fears, confront them and find ways to move beyond them. Some common fears seen in entrepreneurs are as follows:

2.7.1 Fear of failure: The fear of failure works on the presumption that everything could go wrong in the business. The best way to overcome this fear is to accept that failure is possible, look on the positive side and consider added value that comes with every failure, in the form of strength, courage, wisdom and knowledge.

2.7.2 Fear of the unknown: Entrepreneurial journey is full of ambiguities and uncertainties. It is common to avoid uncertainties and unknown because we fear change. Many people are afraid of losing control and being unable to manage potential outcomes. The best way to overcome this fear is to recognize that life is full of uncertainties and that there is no guarantee that plans will work. Hence, change must be accepted.

2.7.3 Fear of not being an expert: This fear can become a barrier for many budding entrepreneurs. It is the feeling of not knowing enough about your industry or business or product. Many entrepreneurs are not considered experts in their line of business, but still they make important decisions and solve issues everyday within their industry. The best way to overcome this fear is to constantly and continuously learn about what one does not know.



3.1.4. Information Seeking: A successful entrepreneur always keeps his/her eyes and ears open and is receptive to new ideas which can help in realizing his goals. He/she is always open to consult with experts and mentors to get the right guidance and advice.

3. 1.5. Concern for High Quality: Successful entrepreneurs are seen to be not satisfied with moderate or average performance. They set high quality standards for themselves and then put in their best for achieving these standards. They believe in excellence, which is reflected in everything they do.

3.1.6. Commitment: Entrepreneurs exhibit high level of commitment towards their work and decisions. For an entrepreneur to succeed, they have to stay committed to their venture and their goal.

3.1.7. Concern for Efficiency: Many entrepreneurs are always keen to devise new methods aimed at promoting efficiency. They try and create new methods that aim at making working easier, simpler, better, and economical.

3.1.8. Systematic Planning: Successful entrepreneurs decide future course of action keeping in mind the goals to be achieved. They believe in developing relevant and realistic plans and ensure proper execution of the same in pursuit of running a successful enterprise.

3.1.9. Problem Solving: An entrepreneur takes each problem as a challenge and put in best for finding out the most appropriate solution for the same. He/she will first of all understand the problem and then evolve appropriate strategy dealing with the same.

3.1.10. Self-confidence: Entrepreneurs are not cowed down by difficulties as they believe in their own abilities and strengths. They have full faith in their knowledge, skill and competence and have the confidence to handle future uncertainties.

3.1.11. Assertiveness: An assertive person knows what to say, when to say, how to say and whom to say. Entrepreneurs exhibit assertiveness in situations around decision making to ensure that interests of the organization are aligned with decisions and actions of the entrepreneur and its team.

3.1.12. Persuasiveness and Influencing Others: Entrepreneurs have to persuade different cohorts of people at different stages, such as employees, customers, clients, suppliers etc. Through sound opinions and logical reasoning, an entrepreneur manages to convince others about what he/she wants.

3.1.13. Effective Strategist: A successful entrepreneur possesses the ability to formulate relevant strategies, aimed at safeguarding or promoting the organization's interests and goals. Strategy may be with respect to facing future uncertainties or challenges posed by competitors etc.

3.1.14. Effective Monitoring: Entrepreneurs monitor that everything is carried out in their organizations as per their decisions but at the same time give some flexibility to the employees. They ensure regular monitoring of the working so that the goals of the organization are achieved in best possible manner.

3.1.15. Concern for Employees Welfare: Dedicated, committed and loyal employees directly influence the performance of the organization. A successful entrepreneur tries to promote interests

of employees, helps in solving problems confronting employees and generates the feeling that there is interdependence of the interest of employees and the management.

3.1.16. Adaptability: Adaptability refers to the capacity to adjust one's thoughts and behaviours in order to effectively respond to uncertainty, new information, or changed circumstances. In business, adaptability becomes a survival skill as the nature of businesses is dynamic. Uncertainty around globalization, new technologies, market trends, etc., poses a tremendous challenge for applying the right business strategy. Entrepreneurs learn to disrupt, pay the price and bring change. It is impossible to accomplish this without developing the skill of adaptability.

3.1.17. Decision Making: One of the most important traits of being an entrepreneur is being able to take decisions that more often than not, decide the fate of the company. At the helm of the company, entrepreneurs often have to take that one decision at the right time which can define the future of their company. And then they also have to quickly act upon their decisions.

3.1.18. Goal Setting: Goal setting refers to establishing short or long-term objectives, usually along with incorporating deadlines and quantifiable measures to indicate if they have been achieved. For a business, the ultimate goal is to make profit. For a social enterprise, the ultimate goal might be to sustain itself and create the impact that it aims to. Entrepreneurs set various goals with different timelines. Each action and decision is taken to achieve a certain goal.

3.1.19. Team Building: Team building is any action or method that brings a group of individuals together and motivates them to work cooperatively as a team. It refers to the various activities undertaken to motivate the team members and increase the overall performance of the team. Teams are formed when individuals with a common interest come together on a common platform to achieve a predefined target. The main goals of team-building are to improve productivity and motivation.

3.1.20. Interpersonal Skills: For smooth functioning of a team, each member must be consistent and clear in their communications and interpersonal skills. Clear communication helps everyone in the team to understand what's expected and how it's measured. It must also be ensured that no member offends the other.

3.1.21. Creativity: Creativity is a process of continually improving ideas and solutions by making gradual alterations and refinements. Entrepreneurs exhibit creativity by applying the process of design thinking, thinking of alternatives, trying unconventional ways to do things and continuously improvise and iterate.

3.1.22. Risk Taking: Entrepreneurs take enough risk but it is a calculated risk. They use risk management principles to assess the loss and return of the risk.

3.1.23. Perseverance: It is important to be perseverant and patient and ready to continue even if the first battle is lost. Entrepreneurs need to stay put, be patient and believe in their vision. It is only by trying different things and ways to do them, that a solution can be found.

3.1.24. Negotiation skills: Negotiation skills for entrepreneurs are critically important to business success. There a number of scenarios where an entrepreneur's negotiation skills come into play such as supplier relations, customer sales, employee hiring, securing investors etc.

3.1.25. Organizational skills: Organizational skills for entrepreneurs are not just about structuring and prioritizing their daily work, but mainly about managing teams, delegating, setting targets, continually reviewing and leading and motivating the people around them.

3.1.26. Stress management: Entrepreneurs have a hectic work life and thus, it is important for them to manage and handle stress. This refers to taking systematic breaks, maintaining work-life balance, setting achievable goals, connecting with other like-minded entrepreneurs etc.

3.1.27. Valuing service and diversity: Diversity is about how an organization treats its people authentically down to the roots of its business model. It is key for an entrepreneur to remember that a person working for him/her is actually providing their service. At the same time, people of all cultures, race, religion, gender etc. have to be treated equally and with respect, such that they mutually flourish and grow together.

3.2 Benefits of Entrepreneurial Competencies

- Taking actions to implement your ideas.
- Understanding the need or the problem your offering is fulfilling or solving.
- Strategizing and planning the steps that need to be taken.
- Preparing an action plan and timeline.
- Networking with stakeholders.
- Interacting with customers.
- Gaining and analyzing insights.
- Looking for alternatives and adjusting plans according to analysis and feedback.
- Evaluating and calculating the risk involved.
- Building and motivating a team.
- Being patient and staying motivated to overcome and work around various obstacles.
- Showing the value that the business is creating for stakeholders and customers.
- Gaining the know-how of creating, building, launching, sustaining, managing and growing a business.

Activity I – Self Reflection

Self-reflect and check if you relate to the statements given below:

I like to give myself challenges when I take on a new project.

Where others see problems, I see possibilities.

I do not worry about what others will think before doing something important.

I am fairly curious and I am continually in search of discovery.

I want to build something that will be recognized publicly.

When I take on a project I have confidence that I will carry it out successfully.

I feel that am capable of seeing many solutions to a problem.

I always try to learn lessons from my failures.

I am not afraid to take on initiatives.

I manage my stress well in ambiguous and uncertain situations.

After some self-reflection, consider the competencies of entrepreneurs given above. Self-evaluate yourself on these competencies by giving a rank number to each.

Activity IV – Information Seeking

Read the situations below and write answers to the questions given below:

- Who should the entrepreneur seek information from?
- What information should the entrepreneur acquire?

Simaya has started a company which makes bags and wallets using fish leather. Fish leather is made by using the waste material from the fishing industry. Simaya is trying to understand who her customers are. She is not sure if she should start selling the products online or supply to offline stores or do both. She does not know what will be the touch points where people could buy the products she is planning to design. She wonders what preferences and choices people would have.

Dhruv has started a brand that customizes kid's shoes. While he has made sales on some online websites selling kids products, he is unable to make a sustainable profit. He is also looking for ways to raise some capital to start selling from his own website and retail store.

Janvi is thinking about starting a business that conducts training workshops for working professionals. She plans to teach business-related topics and develop employability skills through the workshops. However, Janvi does not know what kind of competition will be there. She wonders if she will be able to get enough customers to beat the competition in such a crowded space.

Activity V – Goal Setting

SMART Goals

S.M.A.R.T. is an acronym for the 5 steps of specific, measurable, attainable, realistic, and timely goals. It's a simple tool used by businesses to go beyond the realm of fuzzy goal- setting into an actionable plan for results.

Specific: Great goals are well-defined and focused. The moment one focuses on a goal, the goal becomes a magnet, pulling resources towards it. The more focused one's energies, the more power one generates.

Measurable: A goal without a measurable outcome is like a sports competition without a scoreboard or scorekeeper. Numbers are an essential part of business. Concrete numbers should be put in the goals to know if one is on track.

Attainable: A goal must be achievable. Far too often, small businesses can set goals beyond reach. No one has ever built a multi-crore business overnight. Venture capitalists and angel investors discard countless business plans of companies with outlandish goals.

Realistic: Achievable business goals are based on the current conditions and realities of the business climate. One may desire to have the best year in business or increase revenue by 50%, but if a recession is looming and three new competitors open in the market, then the goals are not as per the realities of the market.

Timely: Business goals and objectives just don't get done when there's no time frame tied to the goal-setting process. Every plan or project must follow a timeline. Whether the business goal is to increase revenue by 20% or find 5 new clients, a time-frame or deadline to accomplish the goal must be set.

Let us do small exercises to understand SMART goals better.

Specific:

Look at the examples below. Underline the goals that are specific.

Get in shape.

I will go to the recreational centre Monday, Wednesday, and Friday at 6:00 a.m. and walk around the track for 30 minutes.

Get good grades.

I will sit at the table every day at 3:30 p.m. and work on assignments given that day in school until 4:30. Upon completion, I will place the assignments in the correct folder, take to school and turn in before class starts.

Get rich.

I will save 25% of my paycheck every month and invest in mutual funds until I am 55 years old.

Measurable:

The above examples give good indications. Write in the measurable outcomes from the above examples of #2, #4, #6.

#2. _____
#4. _____
#6. _____

Attainable:

- Which of these goals seem attainable?
- Earn 10 times the money I make compared to this month.
- Exercise daily for one hour.
- Eat an apple a day.
- Watch television for all night but wake up early every morning.
- Live in Antarctica for a year, after I have lived in Mumbai all my life.

Realistic:

If I wanted to run a marathon and I haven't done any training, which goal would better represent my reality?

I will walk every day for 30 minutes for one week, jog for 30 minutes for two weeks, add five minutes to my work out every week until I reach 60 minutes and continue training for three months.
I will run the marathon on Saturday.

Timely:

Give yourself a deadline. When you have an end date, you will finish your goal. Look at the above examples (all of them). Write the goals that have a time frame.

Activity VI – Goal Setting

Write an academic or personal goal below in the SMART manner:

S – My SPECIFIC Goal

M – How will I MEASURE my progress?

A – What ACTIONS must I take to accomplish this goal?

R – Is my goal REALISTIC and attainable? ___ Yes ___ No

T – Is my goal TIMELY? When will this goal be accomplished?

Activity VII– Decision Making

Decision Making..... The Lunar Disaster

On April 11, 1970 astronauts James Lovell, John L. Swigert, and Fred W. Haise blasted off from Cape Kennedy aboard Apollo 13. At 54 hours and 54 minutes into the mission a large explosion crippled the spacecraft. Four days the attention of the world was riveted on the disabled spacecraft. Because of quick thinking and the use of computers, mission control was able to get the crippled spacecraft safely back to Earth.

In this activity, you are a member of the crew of a spaceship scheduled to rendezvous with the mother ship, located on the lighted surface of the moon. Due to mechanical difficulties, your ship is forced to land on the dark side of the moon, 200 miles (~ 322 km) from the mother ship. During the emergency landing much of the equipment aboard was damaged and since survival depends on reaching the mother ship, only the most critical items must be chosen for the 200 mile trip. Below is a list of 15 items left undamaged by the crash. Rank each of these items in order of importance from 1 the most important to 15 the least important.

Here is some background information, which may be useful. There is no atmosphere or water on the moon, and the moon has almost no magnetic field. A FM transmitter uses straight-line communication and has a range of less than 100 miles on the Earth, so on the moon the range would be considerably less. The gravity on the moon is 1/6th that of the Earth. The items below are in no particular order.

Item	My Ranking (Individual score)	Group ranking (group score)
Box of matches		
Food concentrate		
Nylon rope, 50 feet		
Parachute silk		
Portable heater		
Two 0.45 caliber pistols		
Dehydrated pet milk, One case		
Two 100-Pound oxygen tanks		
Star Map-Moon Constellations		

Life raft		
Magnetic compass		
5 gallons of water		
Signal flares		
First-aid kits, injection needles		
Solar powered FM transmitter		

After ranking each item 1-15, get together with another student and re-rank the items remember 1 is the most important and 15 is the least important. With your partner(s) AGREE on a ranking (Do not change your individual score) and place the number under group rank (each person in the group should have the same GROUP rank). After completing both individual and group ranking your teacher will give you the actual ranking determined by NASA.

To score subtract the difference between the number written with the actual number given by your teacher. Place the difference in the column labeled score (Individual and group)

After completing the scoring add up the numbers in each score column and place the total in the spaces below.

Individual score _____

Group score _____

Reflect on the decision-making process you followed.

Discuss why the scores increased or decreased after working together.

Discuss ways of thinking critically in the future.

Note: The answer key of actual ranking/score is given at the end of the chapter.

Activity VIII – Team Building

For this activity, you have to work on the following problem:

How can the problem of waste generation be solved? This could include e-waste, plastic waste, greenery/kitchen waste, hazardous waste etc.

Get into groups of 7.

Take a piece of paper.

Any one member has to start with writing an idea to solve the problem on the paper.

Then, pass the paper to the next person in the group.

The next person has to build on the idea written by the first person and then pass it to the third person.

The third person will then build on the idea written by the second person and so on.

This will continue once all people in the group have built on the idea of the previous person.

The final idea will then be discussed and refined by the group and shared with the class.

Activity IX - Adaptability

In this activity, we will make a story using other classmates' inputs. To do this, please follow the steps given below:

Get in groups of 10.

Any one person in the group has to start a story from “Once upon a time.....” and stop after speaking for around 1 minute.

As the first person stops, the second person has to continue the story started by the first person.

Similarly, after the second person speaks for 1 minute, the third person has to continue the story from where the second person stopped and so on.

This goes on until the story is completed by the tenth person.

After doing this exercise, reflect on the following questions:

Did you find challenging to adapt to someone else’s story? Why?

What did you learn about yourself from this exercise?

One a scale of 1 to 10, how would you rate your skill of adaptability?

Activity X – Problem Solving

Read the statements below about different startups of India and how they define themselves. Based on that, and your own research, enlist the problems that these startups are trying to solve:

1. Interview Bit is an interview preparation platform, especially designed for software engineers. It provides support to job candidates via a range of practice questions and on-demand mentors.

2. Cure.Fit is a startup in the fitness and healthcare industry. It has a chain of fitness centres which offer different types of fitness activities and classes everyday. It also has an part of called Eat.fit, where a customer can order healthy meals everyday.

3. 1mg is India’s leading consumer health platform by offering an online pharmacy network and generic medicine engine. It aspires to be the trusted health partner for all Indians and its mission is to make healthcare accessible, understandable and affordable for all Indians. Users can find information about medicines based on ailments, class, companies, and brands, and buy them.

4. EduKart is an online marketplace for education that aims to democratize education and bring more flexibility into the system. It offers both short certification courses and degree programmes for which it has partnered with renowned institutions.

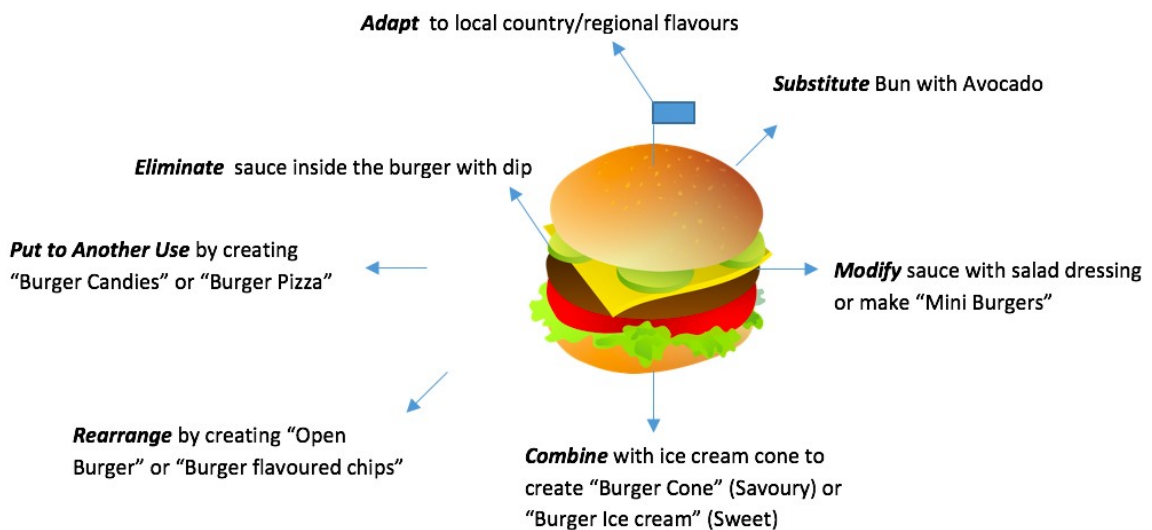
Modify/Minify/Magnify: Change size, shape or colour or any specific trait and reimagine it.

Purpose/Put to Other Use: Use it in a way that it wasn't meant to be used. Change the purpose it is used for.

Eliminate: Remove any unnecessary element that might create an issue or a problem.

Reverse/Rearrange: Change the direction or orientation. Look at it differently. Maybe move it upside down or use it backwards.

Example:



Use S.C.A.M.P.E.R. to build a better school desk/table or chair. Feel free to draw or write your ideas!

1. What will you **substitute**? Can you change any parts? Can you change its shape, color or thickness?

2. What will you **combine**? Can you combine any materials, parts or ideas?

3. What will you **adapt**? What else is like this? What other ideas does it suggest? Can you incorporate something?

4. Will you **modify**, minimize or maximize? Can you make something higher, bigger or stronger? Can you simplify something or make it smaller?

5. What else could I **use** it for? Can it be used in an unconventional way?

6. What will you **eliminate**? Can you think of something unnecessary that can be removed or omitted?

7. Will you **reverse or rearrange** any parts? What if you moved or turned it upside down? Can you imagine another layout or sequence? Can you interchange components or patterns?

Activity XIII - Creativity

Think of 10 unconventional uses of the following objects....

1. Paper Clip

2. Tennis Ball

3. Clothes Hanger

4. Feather

5. Water bottle



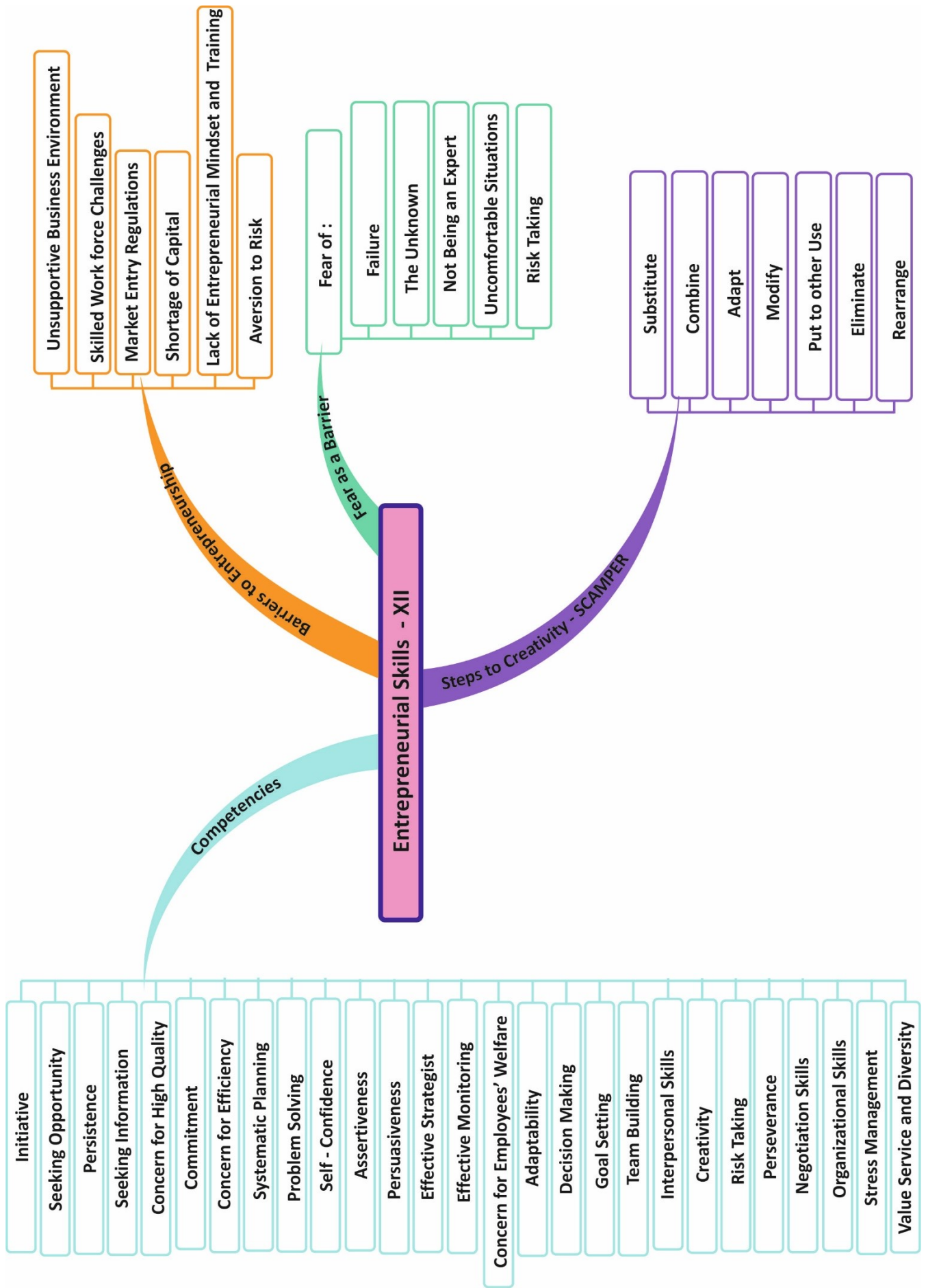
Skill- Based Activities

- Research and administer a self- rating questionnaire and score responses on entrepreneurial competencies.
- Collect a small story/ anecdote of prominent successful entrepreneurs.
- Identify entrepreneurial competencies reflected in each story and connect it to the definition of entrepreneurial competencies.
- Prepare a competency profile of yourself.
- Participate in games and exercises on changing entrepreneurial behavior and development of competencies for enhancing self- confidence, problem solving, goal setting, information seeking, team building and creativity

Answer Key for Activity VII

Item	Actual Score	(Individual score)	Actual Score	(group score)
Box of matches	15		15	
Food concentrate	4		4	
Nylon rope, 50 feet	7		7	
Parachute silk	8		8	
Portable heater	5		5	
Two 0.45 caliber pistols	11		11	
Dehydrated pet milk, One case	12		12	
Two 100-Pound oxygen tanks	1		1	
Star Map-Moon Constellations	3		3	
Life raft	6		6	
Magnetic compass	14		14	
5 gallons of water	2		2	
Signal flares	13		13	
First-aid kits, injection needles	9		9	
Solar powered FM transmitter	10		10	







1. Introduction

To achieve the aim of more sustainable economy and society, the concept of Green Jobs came into existence. As discussed previously, the main objective of a sustainable society is judiciously using the natural resources for the present and future generation.

In 2008 the United Nations Environment Programme (UNEP), the International Labour Organization (ILO), the International Trade Union Confederation (ITUC), and the International Employers Organization (IEO) jointly launched the Green Jobs Initiative. The purpose is to bring a just transition to a green economy by providing space for workers, employers, and governments to negotiate on policy effective in providing equitable opportunity to green jobs.



Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World is the first comprehensive report on the emergence of a “green economy” and its impact on the world of work in the 21st Century. The report defines “green jobs” as work in agriculture, industry, services and administration that contributes to preserving or

restoring the quality of the environment. Green jobs reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable.

Green jobs are found in many sectors of the economy from energy supply to recycling and from agriculture and construction to transportation. They help to cut the consumption of energy, raw materials and water through high-efficiency strategies, to de-carbonize the economy and reduce greenhouse-gas emissions, to minimize or avoid altogether all forms of waste and pollution, to protect and restore ecosystems and biodiversity.



Green jobs play a crucial role in reducing the environmental footprint of economic activity. This reduction is gradual and the different jobs contribute to different degrees. Workers manufacturing fuel-efficient or hybrid cars, for example, contribute less to reducing emissions from transport than those working in public transport systems. Moreover, what is considered fuel-efficient today will no longer qualify in ten years’ time. The notion of a green job is thus not absolute, but

there are ‘shades’ of green and the notion will evolve over time.

Until now, there has been much anecdotal evidence indicating that the pattern of employment is indeed changing—and that new jobs are beginning to emerge in favour of greener, cleaner and more sustainable occupations.

2. What are the Key Drivers of Green Employment?

Green innovation helps businesses stay at the cutting edge, retaining existing jobs and creating new ones.

Modern economies mobilize enormous quantities of fuels, metals, minerals, lumber, and agricultural raw materials. Although some changes have been made in past decades to reduce the world economy's environmental impact, these gains are insufficient and may simply be overwhelmed by continued economic growth. In view of the gathering environmental crisis, and especially the spectre of climate change, there is an urgent need to make economies far more sustainable and thus to re-examine the prevailing production and consumption model. Concepts such as dematerialization, remanufacturing, "zero waste" closed-loop systems, durability, and replacing product purchases with efficient services (such as "performance contracting") have been discussed for some time and tested in some instances, but by and large have yet to be translated into reality. Economic systems that are able to churn out huge volumes of products but require less and less labour to do so pose the dual challenge of environmental impact and unemployment. In the future, not only do jobs need to be greener, their very essence may need to be redefined.



Hold a group discussion on possible ways to promote Sustainable Development. Do not forget to highlight the role of changing careers in propelling the idea of Sustainability.

3. Green Jobs



organic gardens on roof tops to grow seasonal vegetables and fruits, while many do it as a hobby and love for gardening, there are many who do it for living.

3.1 Urban Growers: They manage terrace top gardens to grow fruits and vegetables in urban cities. They use environment friendly ways to grow fruits and vegetables. Today there is a shift in the demand of consumers. The rising instances of food adulteration and use of pesticides in the fruits and vegetables had paved a way for need of Organic food. Many people have their own

3.2 Clean Car Engineers: Recent initiations by Government on restricting the vehicular movement around Diwali time through 'Odd-Even' Scheme says a lot about the need of Clean Car Engineers. These people explore ways and means in which the cars don't emit poisonous gases and keep the air clean to breathe. The Clean Car Engineers job is to design future transport that will be sustainable. This would not only mean to help keep air clean but also how to keep natural resources available for future generation without compromising the quality – as in average, engine life, durability etc.

3.3 Biofuel Jobs: Biofuel is the non-conventional fuel that is sought for to run vehicles etc. without creating pollution. Since petrol and diesel create lot of pollution, there is a need to have clean fuel. It is felt that fuel from bio mass or natural matter can help resolve this problem.

3.4 Building Roads with Plastic wastes: Engineers have found ways and means to solve two problems at one go. The waste plastic generated in tons over the globe can be utilized to make roads. This will not only provide better roads for vehicles to move but also solves the problem of waste generation.

3.5 Solar Cell Technician: Use of solar energy is in high demand these days. This calls for the services and knowledge of Solar Cell Technicians. Using the right substance in the panels that is durable and affordable is a challenge. These people test the same on different substances for better results.

3.6 Solar Panel Engineers & Installer: Solar Power Plant engineers and installers play very important role in successfully designing and installing solar plates to produce electricity.

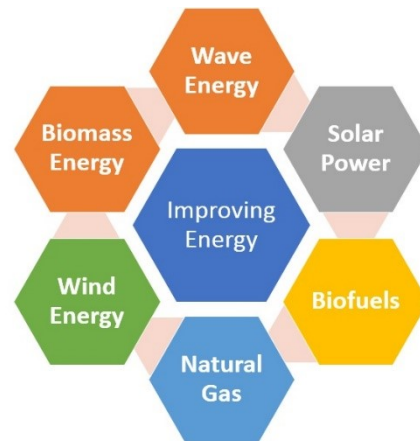


3.7 Wind Energy Workers: After the solar energy, wind energy is also sought for to produce electricity. Hence, the wind energy workers would be needed to lay down the plan for same.

3.8 Wave Energy Producers: Another way to generate electricity without exhausting resources could be using the energy of waves from oceans. Since, 70% of our planet consists of water bodies, this could be useful in creating sustainable society.

3.9 Water Quality Technicians: Water Pollution is in its alarming state. This has given rise to the need of Water Quality Technicians to help monitor the water quality and treat it.

3.10 Rain Water Harvesting Engineers: With the rising problem of scarcity of water, need to build Rain Water pits are on demand. These are specialised to lay the plan and construct rain water harvesting systems (RWHS) for collecting the rain water and reusing same in buildings. The RWHS may also be used to replenish ground water level.



3.11 Waste Water Treatment Workers: People involved in planning and constructing a system in green building to retreat the waste water from the same building and reutilizing it for secondary purposes.

3.12 Recyclers: Waste generation across the globe has given rise to need of segregating waste. The recycler's job is to segregate and collect the recyclable products. These days many recyclers are upcycling the waste products. Over time, the need of recyclers is going to increase.



3.13 E-Waste Recyclers: With advancing technology, organisations and industries across the globe are facing the threat to dispose the e-waste generated by them. Many organisations have now started contacting special recyclers who collect all the electronic waste and recycle it. It is expected that in coming years, we will need more e-waste recyclers.

3.14 Sewage Treatment Plants: The process to treat the waste in its impure form at a sewage treatment plant involves human engineering. People involved in the process will also have Green collar jobs.

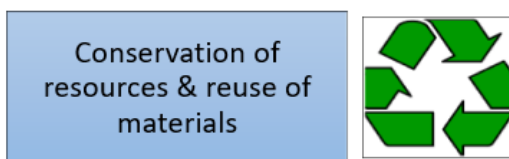
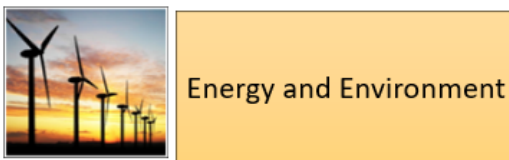
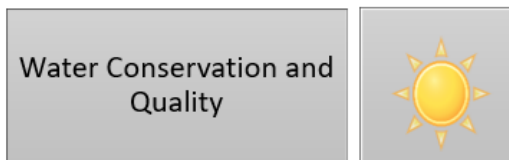


3.15 Eco-Tourism: Eco-Tourism is relatively new area focussing on socially responsible travel, personal growth and environmental sustainability. This includes visiting fragile, pristine and undisturbed areas of nature.



3.16 Green Builders: Green Builders ensure that environment friendly things are used to build houses and buildings.

3.17 Green Design Professionals: The Green design professionals work in collaboration with Green Builders. They lay the idea of how the building will look like after its completion. The green design professionals also provide artistic beauty to buildings to make them look innovative and interesting.



3.18 Energy Auditors: Energy Auditors inspect the buildings and measure heat, cooling, electrical and gas usage and find energy leakages in a structure.

3.19 Energy Consultants: They help organisations analyse their energy consumptions with aim to reduce the same.

3.20 Environmental Engineers: Environmental engineers provide solutions to environmental problems by using engineering, biology and chemistry. Providing solution to improve the quality of soil for better productivity, devising strategies to generate public electricity using renewable resources like solar street lights etc. is a part of

environmental engineering.

3.21 Natural Scientists: As we take step towards using sustainable means to create a sustainable society, it is very important to record and analyse the impact of our steps on environment. Natural Scientists help in achieving this aim.

3.22 Working with a Non- Governmental Organisation (NGO): Working with an NGO for the cause of Environment provides opportunity to closely work for creating a sustainable and better society.

3.23 Environmental Education Teacher: A teacher who takes up the role of sensitising young minds and creates acceptance amongst them to contribute in protecting environment.

3.24

Project Work - 1

Choose any 4-5 Green Careers and prepare a brochure elaborating all the aspects like Educational Qualifications, Skills, Universities and colleges where these courses are available etc.

4. Role of Green Jobs

- i. **In toxin free homes:** Collins English Dictionary defines Toxin as “any poisonous substance produced by bacteria, animals, or plants.”

Do you think there are toxins in our environment? What is your view of toxins in our homes?

Well, yes, there are toxins present in our environment and environment includes our homes also. Hence, the role of green jobs in our homes is to make it toxin free so that we have a healthy life.

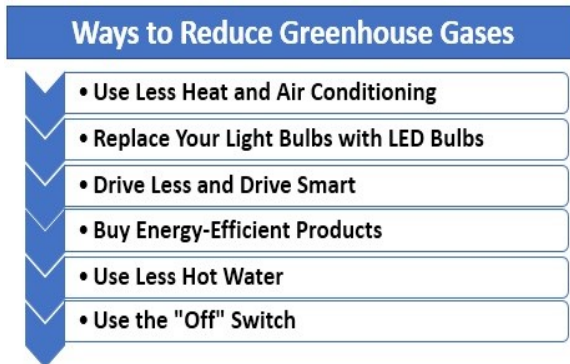
Toxins may be present in our homes in many ways such as – refrigerators releasing CFCs, cleaning and washing products, cosmetics, upholstery fabrics, rugs, mattresses, paint used on



the wall, chemicals used to polish the floors, fragrances, some kind of clothes that uses chemicals, use of RO and Microwaves in our kitchens etc. So, in order to ensure that our

homes are safe from toxins and healthy places to breathe people with green collar jobs help us maintain a healthy environment.

ii. **In improving energy and raw material use:** The exhaustive list of Green jobs mentioned above



elaborately describes their role in improving the quality of energy. The energy produced through hydro-electric power plants, thermal power plants, nuclear power plants has grave consequences on the environment. Using alternate source of energy to produce electricity will not only minimize the exploitation of resources but will help the

economy to flourish.

iii. **Limiting greenhouse gas emission:** The alternates that the green jobs provide for sustainable development definitely help curb the emission of greenhouse gases. With the promotion of use of renewable sources in our homes and daily life, green jobs promise to limit the emission of harmful gases.

iv. **Minimizing waste and pollution:** This problem has come a long way and the probable solution to this has been provided in 4Rs and 1U of sustainable development – REFUSE, REDUCE, REUSE, RECYCLE & UPCYCLE. Following these has definitely helped minimize the waste and pollution. But, the recyclers job at its best is trying to put a full stop to this problem. The concept of upcycling and the avenues it has created for a green market are luring and helps resolve this problem to a great extent.

v. **Protecting and restoring ecosystems:** Various NGOs across the globe are working day and night to protect the wildlife, forests, endangered species etc. With their efforts we have been able to protect and restore the degrading eco system that would otherwise have collapsed much earlier. Their consciousness has certainly helped create awareness and sensitize masses to join hands together to have a sustainable ecosystem.

vi. **Promote adaptation to the effects of climate change:** Natural Scientist at every point in time keeps us aware about the changes happening in our environment. It is because of them that we are able to prepare ourselves for the worst of the environmental changes and take measures to curb our ways to undo climate changes.

Project Work - 2

In groups, prepare a power point presentation elaborating and discussing the role of green jobs in our daily life. Remember to incorporate how Sustainable Development will be impacted in their absence.



Sources

https://en.wikipedia.org/wiki/Green_job#UNEP_Green_Jobs_Initiative

https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_098504.pdf

https://www.ilo.org/wcmsp5/groups/public/@ed_emp/@emp_ent/documents/publication/wcms_158733.pdf

