

**GRADE 9
PRE- TECHNICAL STUDIES
NOTES**

STRAND ONE: FOUNDATION OF PRE-TECHNICAL STUDIES. SUB-STRAND: SAFETY ON RAISED PLATFORMS.

- ✚ A raised platform in the workplace is any elevated surface or structure where workers stand to perform tasks.
- ✚ It could be something like a ladder, scaffold, or lift that helps them reach higher areas safely.
- ✚ Examples or Types of Raised platforms; ladders, trestles steps, stands mobile raised platforms, work benches and ramps.

Roles of the ladder, trestles, steps, ramps, stands, work benches as raised platforms

1. Ladder:

Provides a portable way for workers to reach elevated areas, such as shelves or high walls.



2. Trestles:

Used to support work surfaces or planks for tasks like painting or

construction, giving workers a stable elevated surface.



3. Steps:

Offers a small, portable platform for reaching slightly elevated areas, useful for quick, short tasks.



4. Ramps:

Allows easy access for people or equipment to move between different levels, often used for loading and unloading.

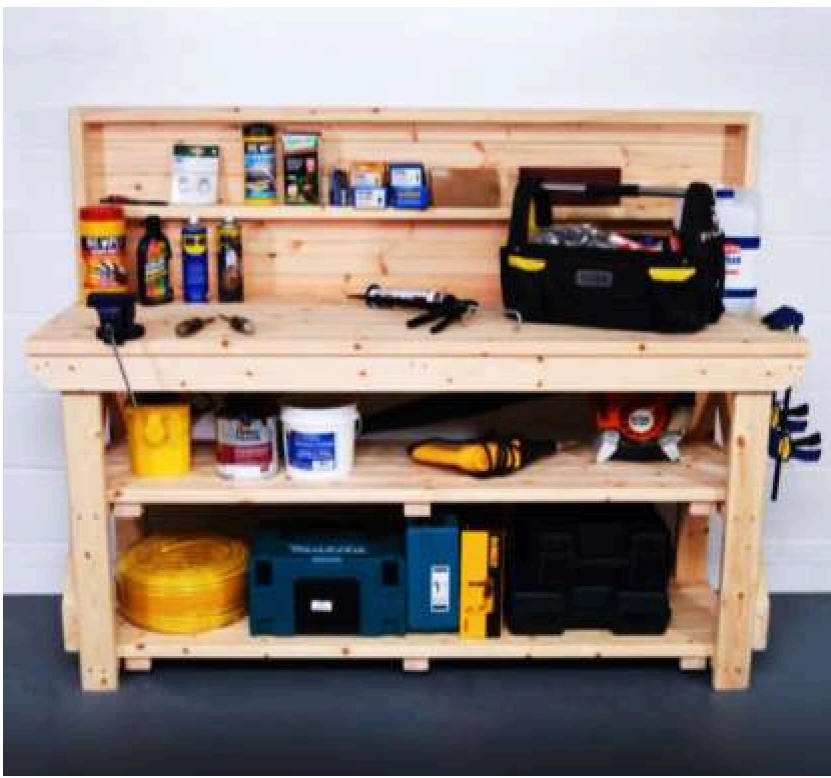


5. Stands:

- ▢ Provides a stable, elevated support for tools, equipment, or materials, often adjustable to different heights.

6. Work Benches:

Serves as an elevated surface for performing tasks like assembling, cutting, or working with materials at a comfortable height.



Risks associated with working on raised platforms.

Definition of Risk:

- ❖ Risk is the chance or possibility that something bad or harmful could happen. It's the likelihood of facing danger, injury, or loss.

Risks Associated with Working on Raised Platforms:

1. Falling from Heights:

- The biggest risk is falling off the platform. This can lead to serious injuries or even death.

2. Slips and Trips:

- Raised platforms can become slippery due to rain, oil, or loose objects, increasing the risk of losing balance.

3. Equipment or Tools Falling:

- Tools or materials can fall off the platform, possibly injuring people below.

4. Platform Collapse:

- If the platform is overloaded or not set up properly, it can collapse, putting everyone on it in danger.

5. Electrocution:

- If the platform is near power lines, there is a risk of electric shock or electrocution.

6. Weather-Related Risks:

- Strong winds, rain, or ice can make working on raised platforms more dangerous by affecting balance and stability.

7. Unstable Surface:

- If the ground or surface where the platform is set up is uneven or soft, it can shift or tip, increasing the chance of accidents.

8. Lack of Proper Guardrails:

- Without guardrails or safety barriers, there's a higher chance of falling off the edges of the platform.

9. Limited Visibility:

- Poor lighting, fog, or dust can make it harder to see, increasing the chances of missteps or slips.

10. Fatigue:

- Working at heights can be physically and mentally tiring, which might lead to mistakes or slower reactions to hazards.

11. Improper Use of Safety Gear:

- If workers don't wear harnesses correctly or use the wrong equipment, the effectiveness of safety measures is reduced.

12. Overcrowding:

- Too many people on a small platform can make it unstable, increasing the risk of falls or tipping.

- ❖ Taking steps to understand and control each of these risks can greatly improve safety when working on raised platforms.

Ways of minimizing risks related to working on raised platforms.

Here are some ways to minimize these risks:

1. Use Safety Gear:

- ✓ Always wear safety harnesses and helmets to protect yourself in case of a fall.

2. Check Equipment:

- ✓ Ensure that the platform, ladder, or scaffold is stable, secure, and in good condition before use.

3. Keep the Area Clean:

- ✓ Remove any objects that could cause someone to slip or trip.
Keep the platform dry to prevent slips.

4. Don't Overload the Platform:

- ✓ Make sure the platform can safely hold the weight of people and equipment on it.

5. Use Guardrails:

- ✓ Install guardrails or safety barriers on raised platforms to prevent falls.

6. Training:

- ✓ Make sure everyone using the platform has proper training on how to use it safely.

7. Watch Out for Weather Conditions:

- ✓ Avoid working on raised platforms during strong winds or rain, as this can make the platform more dangerous.

- ❖ By following these precautions, the risk of accidents and injuries can be greatly reduced.

Importance of observing safety when working on raised platforms.

1. Prevents falls and serious injuries.

2. Ensures a stable working environment.

3. Reduces the risk of equipment or tools falling.
4. Promotes compliance with safety regulations.
5. Protects workers and others around the platform.
6. Increases overall productivity by preventing accidents.
7. Reduces the likelihood of costly medical or legal issues.
8. Enhances worker confidence when safety is prioritized.
9. Protects against structural collapse of the platform.
10. Ensures proper use of safety gear, like harnesses and guardrails.

SUB-STRAND 2.

HANDLING HAZARDOUS SUBSTANCES.

- ❖ Hazardous Substances: These are materials that can cause harm to people, animals, or the environment if not handled carefully. They may be poisonous, flammable, or corrosive.
- ❖ Poisonous: Substances that can make you sick or even be deadly if you eat, drink, breathe in, or touch them. Examples include pesticides or certain chemicals used in cleaning.



- ❖ **Flammable:** These are substances that can easily catch fire if exposed to heat or a spark. Examples include gasoline, alcohol, and paint thinners.



- ❖ **Corrosive:** These are substances that can cause damage by wearing away or "eating through" materials, including skin or metal. Examples include strong acids like battery acid and bleach.



Hazardous Substances Found in the Environment:

1. Poisonous: Pesticides used in farming, certain wild mushrooms, and industrial chemicals released into air or water.

2. Flammable: Gasoline (in fuel stations and vehicles), alcohol, and natural gas used for cooking.
3. Corrosive: Industrial waste like acids from factories, bleach, and some cleaning products.
 - ❖ These substances can be dangerous, so they need to be handled and disposed of with care to avoid accidents and pollution.

Hazardous Substances Found in the Environment

1. Poisonous Substances:
 - Pesticides and herbicides used in farming.
 - Industrial chemicals that may leak into rivers or soil.
 - Heavy metals like lead and mercury from industrial waste.
2. Flammable Substances:
 - Gasoline and diesel fuel used for transportation.
 - Alcohol in products like hand sanitizers and some cleaners.
 - Natural gas used for cooking or heating.
3. Corrosive Substances:
 - Strong cleaning products like bleach or drain cleaners.
 - Industrial acids (e.g., sulfuric acid from batteries).
 - Household products containing strong acids or bases.

Safe Ways to Handle Hazardous Substances

1. **Wear Protective Gear:** Use gloves, masks, goggles, or even aprons when handling hazardous substances to avoid skin contact or inhalation.
2. **Proper Storage:** Keep hazardous materials in clearly labeled, sealed containers and store them in a cool, dry place, away from sunlight and sources of heat.
3. **Avoid Mixing Chemicals:** Some substances, like bleach and ammonia, create toxic fumes when mixed, so it's essential to keep them separate.
4. **Follow Disposal Instructions:** Dispose of hazardous waste according to local guidelines to prevent contamination of soil or water. Never pour chemicals down the drain unless it's safe to do so.
5. **Ventilate When Using Indoors:** Open windows or doors to allow fresh air to circulate, especially when using flammable or strong-smelling products.
6. **Use Only in Well-Ventilated Areas:** When handling substances that release fumes, work outdoors if possible or in areas with good airflow.

Importance of Observing Safety When Handling Hazardous Substances

1. Protects Health:

- ❖ Proper handling prevents exposure to toxins that could cause serious health issues like poisoning, respiratory problems, burns, or even cancer.

2. Environmental Protection:

- ❖ Correctly storing and disposing of hazardous substances prevents pollution of air, soil, and water, protecting wildlife and plant life.

3. Prevents Accidents and Fires:

- ❖ Following safety measures reduces the risk of accidental fires or chemical reactions that could harm people and property.

4. Legal Compliance:

- ❖ Observing safety rules helps individuals and companies follow laws designed to protect people and the environment from harm.

5. Promotes Community Safety:

- ❖ When everyone follows safety guidelines, it ensures that hazardous substances do not pose risks to the larger community.

SELF-EXPLORATION AND CAREER DEVELOPMENT.

Self-Exploration:

- ❖ This means discovering your own interests, strengths, and what you enjoy doing. It's learning about yourself to make better choices for your future.

Self-exploration is necessary for career development because;

- it helps you understand who you are, what you enjoy, and what you're good at.
- This knowledge is important because it guides you in choosing a career that makes you happy and successful.

When you explore yourself, you can:

- **Identify Strengths and Interests:** Knowing what you're good at and what excites you helps you focus on careers that match your abilities.
- **Set Realistic Goals:** Understanding yourself makes it easier to set achievable career goals that align with your skills and passions.
- **Increase Confidence:** When you know your talents, you feel

more confident in your abilities and decisions.

- **Make Better Choices:** Self-exploration helps you avoid careers that might make you unhappy or stressed. Instead, you can choose paths that motivate and inspire you.
- ❖ In short, self-exploration is like a map that helps you find the right career journey for yourself.

Career Development:

- ❖ This is the process of learning and planning for a job or career that fits your skills and interests.
- ❖ It includes studying, getting experience, and setting career goals.

Talents and Abilities.

- ❖ A Talent is a natural ability that allows you to do a particular task with or without guidance.
- ❖ An Ability is a skill that a person learns through a lot of practice.

Differences between Talent and Ability.

TALENT	ABILITY/SKILL
Gift of God.	Acquired and developed

Possessed by few people.	Many people can possess it through learning.
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Requires recognition.	Requires development.
Requires guidance and coaching.	Requires training.

Ways of Nurturing Talents and Abilities

1. **Practice Regularly:** Spend time improving your skills through practice. For example, if you're good at art, draw regularly.
2. **Seek Guidance:** Find a mentor, coach, or teacher who can help you improve. They can give you tips and help you grow your talent.
3. **Set Goals:** Set small goals to reach a bigger goal. This helps you stay focused and keep improving.
4. **Get Training or Education:** Take courses, workshops, or extra classes to learn more about your area of interest.
5. **Find a Supportive Community:** Join groups or clubs where people have similar interests. This helps you learn from others and stay motivated.
6. **Observing and identifying a talent.**
7. **Providing resources to cultivate interests on talents and abilities.**

Relating Talents and Abilities to Career Pathways.

1.STEM (Science, Technology, Engineering, Mathematics):

- ❖ If you are good with numbers, problem-solving, or technology, STEM careers could be a fit. Talents in logical thinking,

designing, or building can lead to careers in engineering, medicine, IT, or research.

2. Social Science:

- ❖ If you enjoy helping people, solving social issues, or studying human behavior, social sciences might be for you.
- ❖ Talents like empathy, communication, and critical thinking are useful in careers like teaching, psychology, law, and social work.

3. Creative Arts:

- ❖ If you love drawing, acting, singing, or creating things, creative arts could be a good pathway. Talents in artistic expression, imagination, and storytelling can lead to careers in music, art, drama, and media.

Career Opportunities Related to Talents and Abilities

1. Musical Talent: Careers like musician, music teacher, sound engineer.
2. Artistic Talent: Careers like artist, graphic designer, animator, or interior designer.
3. Mathematical Ability: Careers like accountant, data analyst, engineer.
4. Communication Skills: Careers in journalism, teaching,

marketing, or law.

5. Athletic Skills: Careers as an athlete, coach, personal trainer, or sports journalist.

Ethical and Unethical Practices Related to the Use of Talents and Abilities

Ethical Practices:

- ❖ Involves using your talents in a responsible, honest, and fair way.
- ❖ For example, giving credit to others' work, working hard to improve, and using your talents to help others.

Unethical Practices:

- ❖ Involves using talents in dishonest or unfair ways, such as cheating, copying others' work, or misusing skills to harm others.
- ❖ For instance, using one's communication skills to spread false information.

Ethical Practices Related to the Use of Talents and Abilities

1. Honesty: Using your abilities truthfully and not cheating or exaggerating your skills.
2. Respect for Others: Acknowledging others' efforts and collaborating fairly.
3. Integrity: Following rules and using your talent to help others or make a positive impact.

4. Accountability: Taking responsibility for your actions and improving your skills through hard work.

Unethical Practices:

1. Cheating or Plagiarism: Copying others' work and claiming it as your own.
2. Exploitation: Taking advantage of others for personal gain, like underpaying someone for their talent.
3. Spreading Misinformation: Using skills like writing or speaking to spread false or harmful information.
4. Harmful Use: Using talents in ways that harm others, such as creating dangerous products or using knowledge of technology for hacking.

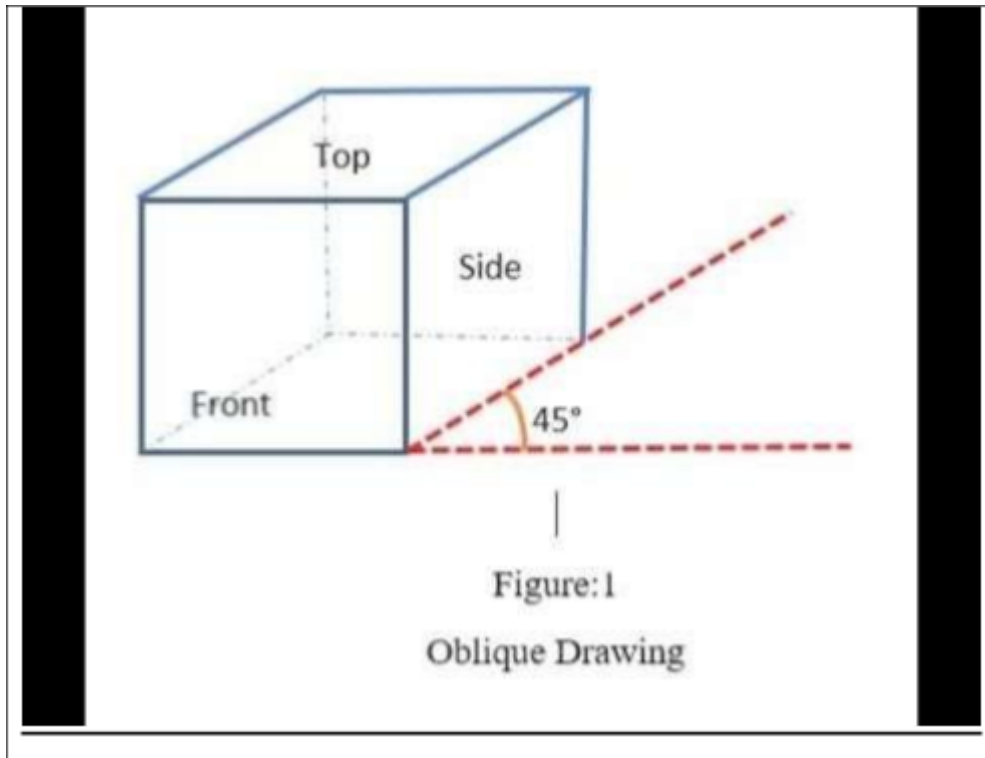
- ❖ Using talents ethically is important because it builds trust, respect, and can positively impact others.
- ❖ Unethical use damages trust and can harm people and society.

STRAND: COMMUNICATION IN PRE-TECHNICAL STUDIES.

SUB-STRAND: OBLIQUE PROJECTION.

Oblique Projection.

- ❖ Oblique projection is a type of drawing technique where an object is shown in 3D by projecting it onto a flat surface, such as a piece of paper.
- ❖ In this projection, the front of the object is drawn true to size, and the other parts of the object are drawn at an angle, usually 45 degrees, and stretched to show depth.



Characteristics of Oblique Drawing in Technical Fields:

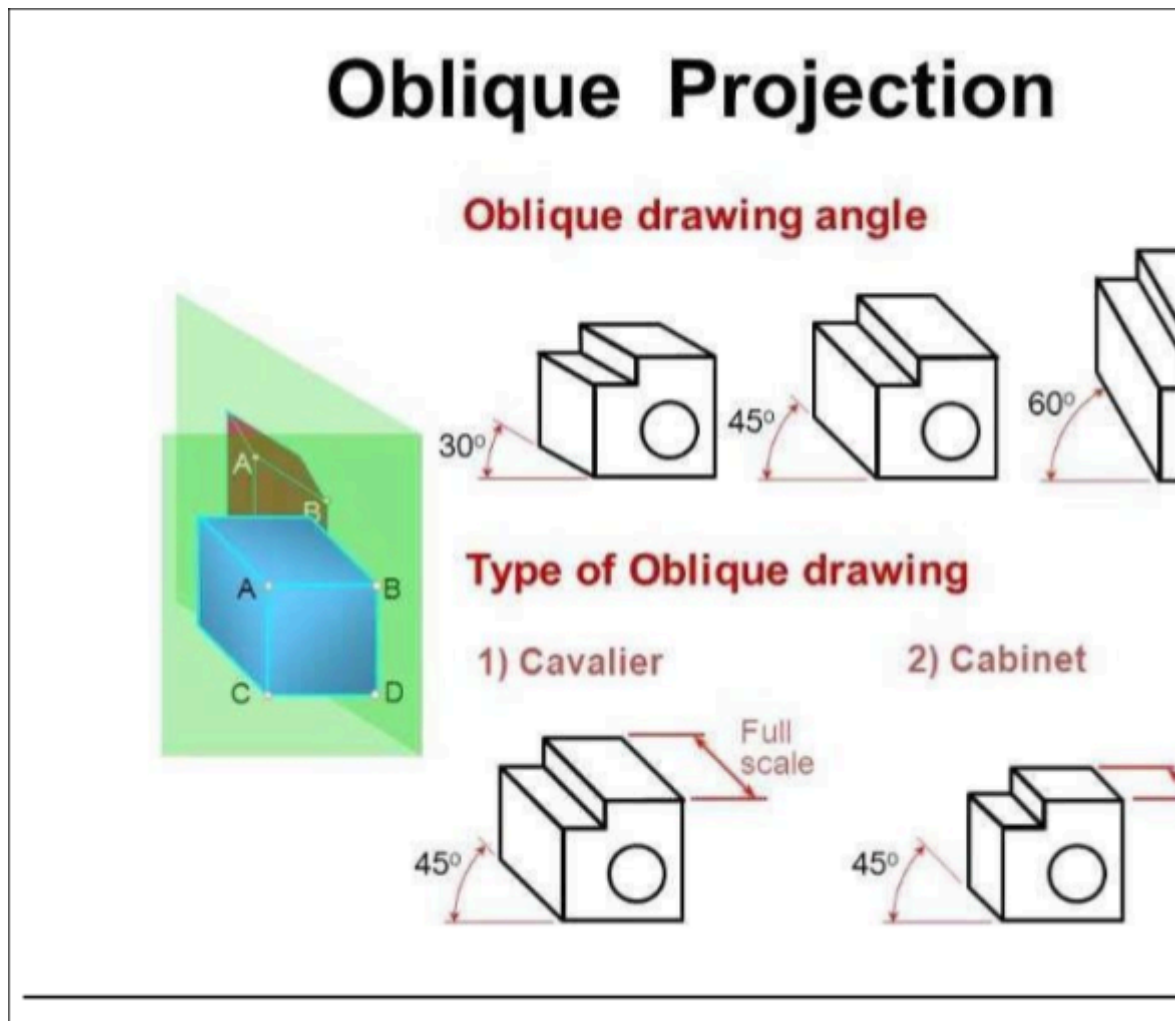
1. **Front View:** The front of the object is drawn in its actual shape and size, showing all details clearly.
2. **Angle:** The other views are drawn at an angle to give the object depth, commonly 45 degrees.
3. **Uneven Scale:** The depth dimension can be drawn using full size (cavalier projection) or half size (cabinet projection), which affects how realistic the drawing looks.
4. **Straight Lines:** Straight lines are used to represent edges, making it easier to visualize and create the object in real life.

5. Simple to Understand: Oblique projection is simpler to draw compared to other 3D projection methods like perspective, making it easy to understand and use for quick sketches.

Steps for Drawing Shaped Blocks in Oblique Projection:

- i. Step 1: Draw the front view of the object as it appears in real life. This is drawn to scale.
- ii. Step 2: From the edges of the front view, draw lines at the chosen angle (typically 45 degrees) to represent the depth.
- iii. Step 3: Measure and mark the depth along the angled lines. The depth can be full scale (cavalier) or reduced (cabinet).
- iv. Step 4: Complete the shape by drawing the final back edges of the object, ensuring all lines are connected properly.
- v. Step 5: Add any necessary details like dimensions or text labels.

Difference Between Cavalier and Cabinet Oblique Projection:



Cavalier Projection:

- The depth is drawn at full scale.
- This gives a more exaggerated, less realistic look because the depth appears longer than in real life.

Cabinet Projection:

- The depth is drawn at half the scale of the front view.
- This creates a more realistic appearance of the object, as the depth is less exaggerated.
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- Uses of Oblique Projection in Society:

1. Product Design: Oblique projection is used to visualize products or machines in 3D for design and manufacturing purposes.
2. Architecture: Architects use oblique projection to sketch buildings and their features, such as windows and doors, to quickly convey their designs.
3. Engineering: Engineers use oblique projection to represent parts of machines or structures to understand their shape and construction.
4. Education: Oblique projections help students and learners understand how 3D objects look by simplifying complex shapes and structures.

□ This technique is useful because it provides a clear, simple way to show depth and dimensions in a 2D drawing.

Oblique drawing is used in various fields for practical and visual purposes.

Here are some common uses:

1. Product Design:
 - Oblique drawing helps designers quickly sketch 3D objects, such as products or machines, showing the front view clearly while adding depth to the design.

2. Engineering and Technical Drawings:

- ▢ Engineers use oblique drawings to represent mechanical parts or components, especially when they need to show both the front and depth of an object without complex perspective views.

3. Architecture:

- ▢ Architects use oblique projections to show buildings, rooms, or layouts in a simplified 3D format, which helps in visualizing how the structure looks from different angles.

4. Illustrating Assembly Instructions:

- ▢ Oblique drawings are often used in manuals to show how parts fit together, giving a clear view of the front and depth of the objects.

5. Education:

- ▢ In educational settings, oblique projection is used to teach students how to visualize and understand 3D shapes on a 2D surface.
- ▢ It's easier to create and interpret than other 3D techniques like perspective drawings.

6. Cartography:

- ▢ Oblique drawings can be used in map-making or land surveys to represent topography, showing both the ground level and elevation changes.

❖ Overall, oblique drawing is favored in situations where clarity

and simplicity are more important than precise realism.

- ❖ It's particularly useful for technical fields that need a fast, straightforward way to represent 3D objects.

VISUAL PROGRAMMING.

Meaning of Visual Programming:

- Visual programming is a type of programming where you create software by manipulating graphical elements instead of writing lines of code.
- It uses pictures, icons, and diagrams to represent actions or operations.
- For example, you can connect blocks that represent different tasks to build a program, similar to solving a puzzle.

Application Areas of Visual Programming Software:

Visual programming software is used in many areas, such as:

1. Education:

- It's used to teach coding to beginners or kids, as it simplifies programming concepts with drag-and-drop features.
- Programs like Scratch help students learn programming logic without writing code.

2. Game Development:

- Visual programming tools allow game designers to create interactive elements and simple games without needing to write

complex code.

- Tools like Unity's visual scripting help in creating game mechanics visually.

3. Automation:

- In business or industries, visual programming helps automate tasks.
- Software like Microsoft Power Automate allows users to create workflows using visual blocks to automate processes like data entry or email management.

4. Data Analysis:

- Software like Tableau or KNIME uses visual programming to help users analyze data and create reports without needing to write code, making it easier to work with data.

5. Robotics:

- Visual programming is often used in robotics for controlling robots and devices.
- It allows users to control robotic systems using a flowchart-like interface, which is easier than traditional coding.

How to Develop an Application Using Visual Programming Software:

- To develop an application using visual programming software, follow these steps:
- ❖ Step 1: Choose a Visual Programming Tool: Select a software tool like Scratch, Blockly, or Node-RED.

- ❖ Step 2: Define Your Goal: Decide what you want your application to do. For example, it could be a simple game, a website, or an automation task.
- ❖ Step 3: Design the Flow: Use the drag-and-drop blocks or icons to design the flow of your program. Each block represents a function or action.
- ❖ Step 4: Connect the Blocks: Link the blocks in the correct order to represent the logical sequence of tasks or actions.
- ❖ Step 5: Test Your Program: Run the program to see if it works as expected. You can tweak or add more blocks to improve functionality.
- ❖ Step 6: Finalize and Deploy: Once the application works as intended, you can deploy it or share it with others.

Use of Visual Programming in Day-to-Day Life:

Visual programming is used in several ways in daily life:

1. Creating Personal Automations:
 - People can use visual programming tools to automate tasks like turning on lights, sending emails, or scheduling reminders.
 - For example, you could use tools like IFTTT to automatically post your social media updates.
2. Building Simple Apps:

- People without coding experience can create their own apps or games using visual programming tools like App Inventor or Thunkable.

3. Control Smart Devices:

- Visual programming is used in controlling smart devices in homes.
- Tools like SmartThings or Home Assistant allow users to automate home appliances like lights, thermostats, or security systems without writing code.

4. Education:

- Kids can use visual programming languages like Scratch to create stories, games, or animations, helping them learn logic and problem-solving without needing to know traditional programming languages.
- ❖ In short, visual programming makes technology more accessible to everyone, allowing people to create software and automate tasks without deep programming knowledge.

STRAND: MATERIALS FOR PRODUCTION.

SUB-STRAND: WOOD.

Definition of Wood:

- ❖ Wood is a natural material that comes from trees. It is made up of cells and fibers, which help trees stand up straight and grow tall.
- ❖ Wood is used for building, making furniture, and many other things.

Types of Wood:



1. Hardwood: Comes from trees that have broad leaves, like oak, mahogany, and teak.
2. Softwood: Comes from trees that have needles and cones, like pine, cedar, and fir.

Examples of Hard and Softwood:

- Hardwood: Oak, Mahogany, Teak

- Softwood: Pine, Cedar, Fir

Physical Characteristics of Hardwood.

1. Denser: Hardwoods are heavier and harder.
2. Durable: They last longer and are strong.
3. Grain patterns: Usually have intricate grain designs.

- Examples: Oak, Mahogany.

Physical Characteristics of Softwood.

1. Lighter: Softwoods are less dense and lighter.
2. Less durable: They are easier to carve and shape but not as long- lasting.
3. Smoother grain: The grain tends to be simpler and straighter.

- Examples: Pine, Cedar.

Methods of Wood Preparation:

1. Conversion:

- ❖ This is the process of cutting trees into logs and then turning those logs into usable wood pieces.
- ❖ This can be done in various ways:
 - a. Sawmilling: Cutting logs into planks or boards.
 - b. Rough sawing: Making the wood into larger pieces that can be shaped later.

2. Seasoning:

- ❖ This is the process of drying the wood to remove moisture.
Fresh wood (green wood) can be too wet, which makes it weak or likely to crack.
- ❖ Seasoning helps the wood last longer and be easier to work with.



- a. Air seasoning: Allowing wood to dry in the open air.
- b. Kiln seasoning: Using a heated oven to speed up the drying process.

Relating Types of Wood to Their Uses in the Community:

- ❖ Hardwood: Because it is strong and durable, hardwood is used for furniture, flooring, and building structures that need to last long, like doors and window frames.

- ❖ Softwood: Since softwood is easier to shape and lighter, it is used for making paper, boxes, construction framing, and furniture that doesn't need to last as long.

Uses of Wood in Daily Life:

1. Building Materials: Wood is used to make houses, furniture, and even bridges.
2. Tools: Some tools like handles of hammers, axes, and gardening tools are made of wood.
3. Paper: Wood pulp is used to make paper.
4. Fuels: Wood can be burned for cooking or heating.
5. Crafts: Wood is used for carving statues, toys, and decorative items.
6. Musical Instruments.
 - Many musical instruments, such as pianos, violins, guitars, and drums, are made from wood.
 - Its resonance and sound qualities make it an ideal material for producing rich, clear tones.
7. Packaging.
 - Wood is used to make boxes, crates, and pallets for storing and shipping goods.
 - Wooden packaging is strong and provides protection for fragile items during transport.
8. Sporting Goods.

- Wood is used in making various sports equipment like baseball bats, cricket bats, hockey sticks, and even ski poles.
- Its balance of strength and weight makes it ideal for these items.

9. Garden Tools.

- Many garden tools, such as rake handles, shovel handles, and hoe handles, are made from wood because it is lightweight yet sturdy.

10. Household Items.

- Items like cutting boards, wooden spoons, serving trays, bowls, and furniture are made from wood.
- They are both functional and aesthetically pleasing in daily use.

11. Toys.

- Wooden toys, such as puzzles, blocks, and dolls, are safe, durable, and environmentally friendly.
- They are often preferred for young children as they are non-toxic and long-lasting.

12. Shelving and Storage.

- Wood is often used for shelves, cabinets, and storage units.
- It provides a strong and attractive way to organize homes and offices.

13. Windows and Doors.

- Wood is used to make window frames, doors, and

shutters due to its durability and insulating properties.

14.Flooring.

- Hardwood floors are popular for their strength, beauty, and long-lasting nature.
- Wood is often used for flooring in homes, offices, and public spaces.

15.Decorative Items.

- Wood is commonly used for making picture frames, mirrors, and other decorative home accessories.
- It brings a natural look to the interior

design. 16.Fencing.

- Wooden fences are widely used to enclose properties. Wood's natural strength and ability to withstand outdoor conditions make it a good material for fences.

17.Construction Forms and Shoring(process of supporting building).

- In construction, wood is used for temporary structures like formwork and shoring to support concrete during the building process.

18.Fireplaces and Mantels.

- Wooden mantels are commonly found around fireplaces, adding warmth and charm to living spaces.
- Firewood is also essential for heating and cooking.

19.Baskets and Wickerwork.

- Wood, especially thin, flexible pieces, is used in weaving baskets and other woven items for storage and decoration.

20. Wooden Utensils.

- Wooden spoons, spatulas, and ladles are commonly used in cooking because they do not scratch cookware and are gentle on non-stick surfaces.
- ❖ Wood is an incredibly versatile material that continues to be essential in various aspects of life, offering both practicality and aesthetic appeal.

Importance of wood in day to day life

- ❖ Wood plays an important role in our daily lives due to its versatility, strength, and sustainability.
- ❖ Here are some key reasons why wood is important:

1. Building and Construction

- ✓ Wood is widely used in construction for building houses, bridges, and other structures.
- ✓ It is strong, durable, and an excellent material for creating walls, floors, and roofs.

2. Furniture.

- ✓ Most furniture, such as tables, chairs, cabinets, and beds, is made from wood.
- ✓ It is valued for its beauty, variety of textures, and the ability to be easily shaped.

3. Sustainable Resource.

- ✓ Wood is renewable and can be replenished if harvested sustainably.
- ✓ Trees can be replanted, and wood products can be recycled, making it an eco-friendly material compared to other building materials like plastic or metal.

4. Paper Production.

- ✓ Wood is used to make paper, which is essential for writing, printing, packaging, and even cleaning.
- ✓ Without wood, we wouldn't have paper for books, newspapers, or notebooks.

5. Fuel.

- ✓ Wood is used as a source of energy in the form of firewood.
- ✓ It has been a traditional and reliable source of heating and cooking fuel, especially in rural areas.

6. Crafts and Art.

- ✓ Wood is commonly used for making various art pieces, sculptures, toys, and household items.
- ✓ Its natural beauty and ease of carving make it perfect for crafting.

7. Transportation.

- ✓ Wooden materials are used in making vehicles like canoes, boats, and even parts of vehicles like dashboards.
- ✓ Wood's lightness and strength make it suitable for some transportation needs.

8. Insulation.

- ✓ Wood has natural insulating properties, which help keep homes warm in winter and cool in summer, making it an effective material for energy conservation.

9. Health Benefits

- ✓ Wooden items, such as beds, desks, and shelves, contribute to better indoor air quality compared to synthetic materials, making wood a healthier option for home furnishings.

10. Cultural and Traditional Importance.

- ✓ Wood has cultural significance in many communities, where it is used in rituals, temples, traditional artifacts, and ceremonial items, playing a key role in preserving traditions.

- ❖ In summary, wood is indispensable in daily life for its uses in construction, furniture, energy, art, and many other aspects, offering both practical benefits and aesthetic value.

HANDLING WASTE MATERIALS.

What are waste materials in the environment?

- ❖ Waste materials are things that people no longer need or use, and they are thrown away.
- ❖ These materials can harm the environment if not handled properly.
- ❖ They include items like plastic, food scraps, chemicals, and old electronics that end up in landfills, oceans, or other places in nature.

Waste materials found in the environment:

- a. Plastic waste: Bottles, bags, and packaging.



- b. Food waste: Leftover food, peels, and scraps.



b. Paper waste: Newspapers, magazines, and cardboard.



c. Electronic waste: Old phones, computers, and batteries.



d. Chemical waste: Pesticides, paints, and cleaning products.



e. Glass waste: Bottles and broken glass.



f. Metal waste: Cans, aluminum foil, and old cars.



g. Construction waste.



Ways of handling waste materials safely in the environment:

1. Reduce waste: Use less plastic and buy products with less packaging.
2. Reuse: Find ways to use things again, like using jars for storage or old clothes for rags.
3. Recycle: Sort and recycle materials like paper, plastic, and metal to be made into new products.
4. Composting: Turn food scraps and garden waste into compost for growing plants.
5. Proper disposal: Take waste to the correct disposal points, like recycling bins or waste collection services.

6. Safe storage: Store chemicals or hazardous materials in sealed containers to avoid spills or leaks.

Importance of proper handling of waste materials in the environment:

1. Protects health:
 - Improper waste can cause diseases or injuries, especially when waste piles up or contains harmful chemicals.
2. Prevents pollution:
 - Waste that is not managed properly can pollute the land, air, and water, which harms animals, plants, and humans.
3. Conserves resources:
 - Recycling and reusing waste help save natural resources, such as trees, water, and energy.
4. Reduces climate change:
 - Proper waste management helps reduce greenhouse gases, like methane from landfills, which contribute to global warming.
5. Preserves biodiversity:
 - By reducing pollution, we protect the homes of many species of plants and animals.

Strand 4: Tools and Production.

Sub-Strand: Holding Tools.

What are Holding Tools?

- ❖ Holding tools are tools used to grip, hold, or clamp objects in place.
- ❖ They help keep items steady so you can work on them, cut them, or fix them without them moving around.
- ❖ These tools make tasks easier and safer.

Holding Tools Used in Day-to-Day Life

Some common holding tools include:

1. Pliers - Used to grip, twist, or cut wires and small objects.



2. Clamps - Used to hold materials together while you work on them.



3. Tongs - Used to hold hot objects or items that are too dangerous to touch with bare hands.



4. Clips - Used to hold papers or other items together.



5. Vice - A large tool used to hold objects in place firmly, often used in workshops.



Functions or Uses of Holding Tools

1. Pliers:

- Pliers are used to grip and bend wires, pull nails, or cut small objects.
- They are also useful for holding small parts in place while you work on them.

2. Clamps:

- Clamps help hold pieces of wood, metal, or other materials together when gluing or nailing them.
- They make sure the materials stay in place as you work.

3. Tongs:

- Tongs are used for safely handling hot items, such as in cooking or working with metal.
- They prevent burns by keeping your hands away from heat.

4. Clips:

- Clips hold papers or fabrics together.
- They are often used to organize documents or keep things in place temporarily.

5. Vice:

- A vice is used in workshops to hold materials (like wood or metal) tightly while they are being cut, shaped, or drilled.
- It ensures the material doesn't move during work.

Safe Use of Holding Tools

1. Pliers:

- Always use pliers with both hands and avoid using them for tasks they are not designed for, like cutting very thick wires.

2. Clamps:

- Be careful not to overtighten clamps, as they can damage the material or cause injury.

3. Tongs:

- Use tongs to handle hot items and wear gloves for extra protection.
- Make sure the tongs are strong enough to support the weight of the object.

4. Clips:

- Be gentle when using clips to avoid pinching your fingers or breaking the clip.

5. Vice:

- Always make sure the object is properly aligned in the vice, and never use it to hold something that could slip or break easily.

Caring for Holding Tools

1. Clean Regularly: After use, clean tools to remove dirt, grease, or rust.

2. Lubricate Moving Parts: For tools like pliers or clamps, regularly lubricate the hinges to prevent them from getting stuck.

3. Store Properly: Store tools in a dry place to avoid rust. Use toolboxes or racks to keep them organized and easy to find.

4. Inspect Regularly: Check tools for any damage or wear. Replace or repair damaged tools to keep them safe to use.

Importance of Holding Tools in Day-to-Day Life

1.Safety:

- ✓ Holding tools help keep materials in place and your hands away from sharp or hot surfaces, reducing the risk of injury.

2. Efficiency:

- ✓ They make tasks easier and faster by keeping objects steady and reducing the need for extra effort.

3. Accuracy:

- ✓ Holding tools help ensure precision in work, especially in tasks like cutting, drilling, or gluing, which require a steady hand.

4. Versatility:

- ✓ Many holding tools can be used in a variety of settings, from the kitchen to the workshop, making them useful for everyday tasks.

- ❖ In summary, holding tools are essential in daily life for making work easier, safer, and more accurate. They help people perform tasks that require precision, stability, or safety.

DRIVING TOOLS.

What are Driving Tools?

- ❖ Driving tools are tools used to push, pull, or strike something to make it move or work.
- ❖ They are often used for tasks like fixing, tightening, or shaping materials.

Driving Tools Used in Day-to-Day Life

1. Hammer



2. Spanner (Wrench)



3. Screwdriver



4. Punches



5. Mallet



Uses of Driving Tools for Different Tasks

1. Hammer:
 - Used for hitting nails, breaking things, or shaping materials like metal.
 - It's useful in construction, repairs, and crafting.
2. Spanner (Wrench):
 - Used to tighten or loosen nuts and bolts.
 - It's common in fixing cars, bicycles, or household appliances.
3. Screwdriver:
 - Used for driving screws into wood, metal, or other materials.

- It's essential for assembling furniture or repairing electrical devices.

4. Punches:

- Used for making holes or indentations in materials like metal or leather.
- They are helpful in metalworking and crafting.

5. Mallet:

- A type of hammer with a soft head, used for striking without damaging surfaces.
- It's useful for carpentry, leatherwork, and other delicate tasks.

Safe Use of Driving Tools

1. Always wear safety gear like goggles and gloves.
2. Make sure the tool is in good condition before use (no cracks or damage).
3. Hold the tool properly to avoid injuries. For example, grip a hammer by its handle and avoid hitting with too much force.
4. Use tools for their intended purpose (don't use a wrench as a hammer).
5. Keep your work area clean and free from distractions to avoid accidents.

Caring for Driving Tools

1. Clean tools after use to prevent rust. Wipe them with a

cloth and store them in a dry place.

2. Sharpen tools like screwdrivers and chisels to keep them working efficiently.
3. Store tools properly, hanging them on a tool rack or keeping them in a toolbox to avoid damage.
4. Check for damage regularly, and replace worn-out parts like hammerheads or rusted wrenches.

Importance of Driving Tools in Day-to-Day Life

- ❖ Driving tools are essential in everyday tasks because they help us fix things, build structures, and maintain our homes, vehicles, and gadgets.
- ❖ Without them, completing tasks like repairing a leaky faucet, assembling furniture, or maintaining a car would be very difficult.
- ❖ They make work faster, easier, and more precise, improving efficiency in daily life.
- ❖ Efficient Work: They make tasks quicker and more efficient, allowing people to complete repairs, assembly, and maintenance faster.
- ❖ Problem Solving: Driving tools help us fix broken items, tighten loose parts, or shape materials, enabling us to solve everyday problems at home, at work, or on the go.
- ❖ Cost Savings: With the right tools, we can repair things ourselves instead of paying for professional services, saving money.

- ❖ Improved Safety: Properly using driving tools can prevent accidents or damage that may occur if tasks were done improperly or without the right tools.
- ❖ Versatility: These tools can be used for a wide range of tasks, from home repairs to car maintenance, making them essential in daily life.
- ❖ Durability of Items: By using driving tools, we can maintain and care for the items around us, helping them last longer and perform better.
- ❖ In summary, driving tools are crucial for maintaining and improving the quality of life by making tasks easier, safer, and more efficient.

STRAND: ENTREPRENEURSHIP.

SUB-STRAND: FINANCIAL SERVICES

What are Financial Services?

- ❖ Financial services are services provided by companies that manage money.

- ❖ They include things like helping people save money, providing loans, offering insurance, and helping businesses manage their finances.
- ❖ These services are important because they help individuals and businesses achieve their financial goals and make money-related decisions.

Financial Institutions Available in Kenya

- ❖ In Kenya, there are several types of financial institutions that provide different services to help people and businesses manage their finances.
- ❖ These institutions include:

1. Banks
2. Insurance Companies
3. SACCOs (Savings and Credit Co-operative Organizations)
4. Microfinance Institutions

Types of Financial Institutions in Kenya

1. Banks.

- ❖ Banks are financial institutions that provide services such as saving accounts, loans, and credit cards.
- ❖ They are the most common type of financial institution and can be found all over Kenya.
- ❖ Examples include KCB, Equity Bank, and Cooperative Bank.

- ❖ Banks provide services to both individuals and businesses.





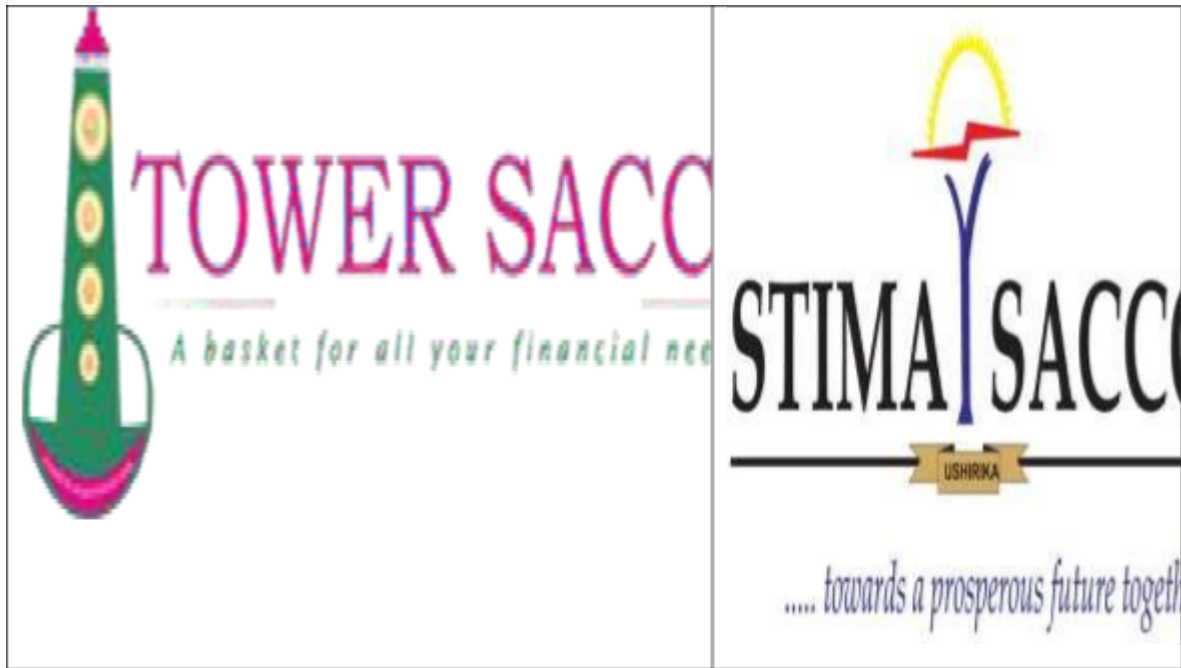
2. Insurance Companies.

- ❖ Insurance companies provide protection against risks such as accidents, illness, or property damage.
- ❖ They offer various types of insurance policies, including life insurance, health insurance, and car insurance.
- ❖ In Kenya, examples include Jubilee Insurance and Britam.



3. SACCOs (Savings and Credit Co-operatives)

- ❖ SACCOs are member-based organizations where people save money and can also borrow money at low-interest rates.
- ❖ SACCOs are especially popular in Kenya, where many people are part of cooperative groups, such as the Tower SACCO (for teachers) and Stima SACCO (for employees in the energy sector).
- ❖ SACCOs promote saving and lending among their members.



4. Microfinance Institutions.

- ❖ Microfinance institutions provide financial services to people who are not able to access services from banks due to lack of collateral or a formal job.
- ❖ They offer small loans (microloans) to help individuals or small businesses grow.
- ❖ Examples include Faulu Microfinance and Kenya Women Microfinance Bank (KWFT).

Services Offered by Financial Institutions in Kenya

1. Savings Accounts.

- ✓ Most banks and SACCOs offer savings accounts where individuals can deposit money and earn interest.
- ✓ This helps people keep their money safe and grow over time.

2. Loans.

- ✓ Financial institutions offer loans to help individuals and businesses pay for things like education, housing, or business expansion.
- ✓ SACCOs and microfinance institutions also offer loans at lower interest rates to their members.

3. Insurance.

- ✓ Insurance companies provide various types of insurance to protect individuals and businesses against unexpected events.
- ✓ This includes life insurance, health insurance, and car insurance.

4. Investment Services.

- ✓ Some financial institutions offer investment opportunities, such as mutual funds or retirement plans, to help people grow their wealth over time.

5. Money Transfers.

- ✓ Many financial institutions in Kenya offer money transfer services, both locally and internationally.
- ✓ These services include mobile money platforms like M-Pesa, which allow people to send and receive money using their phones.

6. Foreign Exchange.

- ✓ Banks and some microfinance institutions also offer foreign exchange services, where people can buy or sell foreign currencies for travel or business.

Utilisation of Financial Services for Entrepreneurial Development

- ❖ Financial services play a key role in helping entrepreneurs develop and grow their businesses.

- ❖ Here's how:

1. Access to Capital.

- Entrepreneurs need money to start or expand their businesses.
- Banks, SACCOs, and microfinance institutions provide loans that entrepreneurs can use to buy equipment, pay employees, or expand their operations.

2. Financial Advice.

- Financial institutions offer advisory services that help entrepreneurs make smart decisions about how to manage their money.
- This could include advice on budgeting, investment, and risk management.

3. Business Insurance.

- Insurance protects businesses from risks like theft, fire, or lawsuits.

- Entrepreneurs can use insurance services to safeguard their business and continue operating smoothly in case of unexpected events.

4. Payment and Collection Systems.

- Financial institutions provide tools like mobile money platforms and bank accounts, allowing entrepreneurs to easily receive payments from customers and make payments to suppliers.

5. Savings for Future Growth.

- Entrepreneurs can use savings accounts to set aside money for future investments or business expansion.
- These accounts help them manage their cash flow and keep funds for business growth.

- ❖ By utilizing these services, entrepreneurs can improve their financial management, reduce risks, and ensure the sustainability of their businesses.

GOVERNMENT AND BUSINESS.

- ❖ Government involvement in business activities is one of the commercial duties it owes its citizens.
- ❖ It is the one that provides the necessary environment for investments to be undertaken by itself, by the local and foreign investors.

❖ This, the government may do in various ways that is;

1. Producing goods and services.
2. Distributing goods and services.
3. Advising producers and traders.
4. Promoting trade and economic development.
5. Protecting consumers against exploitation by producers and traders.

Reasons for Government Involvement in Business:

1. Ensuring Fairness: The government regulates businesses to make sure they operate fairly, preventing monopolies and exploitation of customers.
2. Economic Stability: The government helps maintain a stable economy by controlling inflation, encouraging investment, and regulating trade.
3. Public Welfare: Governments get involved to ensure businesses do not harm public health or the environment and that employees are treated fairly.
4. Promoting Growth: Governments can support businesses through subsidies, grants, and infrastructure development, helping to boost the economy.
5. To prevent foreign dominance of the economy by investing in areas where the locals are not able to.
6. To redistribute wealth where returns are very high.
7. To create employment opportunities by initiating projects such as generation of electricity.

8. To provide goods and services which are too sensitive to be left in the hands of private sector e.g provision of firearms.
9. To stimulate economic development in the country e.g providing social services.
10. To attract foreign investment by initiating major business projects.
11. To provide essential goods and services in areas where private individuals and organizations are unwilling to venture due to low profits or high risks involved.
12. To provide essential goods and services which private organizations and individuals are unable to provide due to the large amount of initial capital required e.g establishment of airlines.

Ways of Government Involvement in Business:

- ❖ The government gets involved in business activities through the following methods:

1. Regulation:

- This involves setting rules and laws that businesses must follow, like safety standards and tax laws.
- Through this method ,the government ensures high quality goods and services and puts in control measures to protect consumers from exploitation.
- The government regulation measures include; (a).Licensing.

□ A license is a document that shows a business has been permitted by the government to operate.

□ It is usually issued upon payment of a small fee.

□ Licensing is the process of issuing licenses to businesses. Reasons for Licensing.

1. To regulate the number of businesses in a given place at any given time to avoid unhealthy competition.
2. To ensure there are no illegal businesses.
3. To control the type of goods entering and leaving the country.
4. To raise revenue for the government.
5. To ensure that those engaging in professional activities meet the requirements of the profession.

2. Subsidies:

□ Offering financial support to businesses, especially in essential sectors like agriculture.

3. Providing Infrastructure:

□ Building roads, electricity, and communication networks to make business easier.

4. Nationalization:

□ Taking control of certain industries or businesses, especially if they are important for national interests.

5. Ensuring standards /enforcing standards.

□ The government regulates business activities by setting

standards that businesses should and ensure that the standards are adhered to.

- To achieve this the government has established bodies like KEBS, The Ministry of Public Health

6. Legislation.

- The government may come up with rules and regulations that regulate business activities e.g banning hawking in certain areas

7. Training.

- The government takes keen interest in training and advising people in business about business management strategies and better ways of producing goods and services.
- The government offers these services through seminars and courses.
- This is mainly done by the Kenya Business Training Institute (K.B.T.I)

8. Trade Promotion.

- This is a government initiated and supported policy to encourage local business people to enter into business.
- This is aimed at increasing the volume and variety of goods and services traded in.

Meaning of Taxes and Paying Taxes in Kenya:

- ❖ Taxes are money that businesses and individuals are required to pay to the government.
- ❖ A tax is a compulsory payment by citizens to the government.
- ❖ Taxation is the process by which the taxing authority (K.R.A)

makes citizens to pay taxes.

- ❖ In Kenya, taxes help the government fund essential services like education, health, and infrastructure.
- ❖ Paying taxes in Kenya is mandatory for both individuals and businesses.
- ❖ Businesses must file tax returns regularly and ensure they meet their tax obligations.

Importance of Paying Taxes in Kenya:

1. Government Services:
 - Taxes help fund essential public services like schools, hospitals, roads, and security.
2. Economic Development:
 - Taxes are used for infrastructure projects and investments that help the economy grow.
3. Social Programs:
 - Taxes support programs aimed at improving the welfare of citizens, such as poverty alleviation and healthcare.
4. Public Infrastructure Development:
 - Taxes help fund the construction and maintenance of vital infrastructure, such as roads, bridges, public transportation systems, and communication networks, all of which support business activities.
5. Supporting Government Projects:

- Taxes contribute to government projects aimed at improving the country's development, including education, health services, housing, and agriculture.
- This creates a better environment for both citizens and businesses.

6. Promoting Economic Stability:

- When citizens and businesses pay taxes, it ensures the government has the financial resources to implement policies that stabilize the economy, curb inflation, and encourage sustainable growth.

7. Attracting Foreign Investment:

- A tax-paying culture shows international investors that the country is stable, organized, and committed to sustainable economic practices, which can attract more foreign investment.

8. Social Security Programs:

- Taxes contribute to social welfare systems like pensions, unemployment benefits, and other safety nets for citizens, improving the overall social well-being of the population.

9. Job Creation:

- Tax revenue helps fund the creation of public sector jobs and the development of programs that support small businesses and startups, leading to more employment opportunities for the public.

10. Promoting National Pride:

- Paying taxes is a way for citizens and businesses to contribute to the national development of Kenya, fostering a sense of ownership, national pride, and patriotism.

11. Ensuring Law and Order:

- Tax revenue funds the police and other security services, helping to maintain law and order, which is critical for the safety of businesses and the general public.

12. Supporting Sustainable Development Goals (SDGs):

- Taxes help the government fund initiatives that align with the UN Sustainable Development Goals (SDGs), such as reducing poverty, promoting education, and advancing gender equality.

13. International Relations and Aid:

- A healthy tax system can help Kenya meet international financial commitments, strengthening relationships with global financial institutions and improving the country's creditworthiness.

- ❖ By paying taxes, individuals and businesses play an essential role in supporting the overall functioning and development of the country.

Types of Taxes in Kenya:

1. Income Tax: Paid by individuals and businesses based on their income. The more you earn, the higher your tax.
2. Value-Added Tax (VAT): A tax added to the price of goods and services. Businesses collect VAT on behalf of the government.
3. Corporate Tax: Paid by companies on their profits. It is typically a percentage of the company's earnings.
4. Fuel Levy: Tax imposed on fuel, which is used to fund road construction and maintenance.
5. Excise Duty: A tax on specific goods like alcohol, tobacco, and luxury products. It is meant to discourage the consumption of harmful goods and generate revenue.

E-Government Services in Business:

- ❖ E-government services allow businesses to access government services online.
- ❖ Examples include:

1. Business Registration:

- Starting a business in Kenya can now be done online through the eCitizen portal.

2. Motor Vehicle Licensing:

- The National Transport and Safety Authority (NTSA) offers services like vehicle registration and renewals online.

3. Tax Filing:

- Businesses can file tax returns online through the

Kenya Revenue Authority (KRA) website e-citizen.

4. Permits and Licenses:

- Businesses can apply for necessary permits like health certificates, trade licenses, etc., through government platforms.

Importance of Complying with Government Regulations in Business:

1. Avoiding Penalties:

- Businesses that fail to follow government rules can face fines, closures, or legal action.

2. Building Trust:

- Complying with regulations helps build a good reputation, ensuring customers and investors trust the business.

3. Ensuring Sustainability:

- Following regulations ensures businesses contribute to the social and environmental well-being of the community.

4. Access to Government Services:

- Compliance is necessary for businesses to benefit from government programs, subsidies, or support.

BUSINESS PLAN.

What is a Business Plan?

- ❖ A business plan is a written document that outlines the goals of a business, the steps needed to achieve those goals, and how the business will succeed.
- ❖ It acts as a roadmap for running the business, guiding entrepreneurs on how to organize, manage, and grow their business.

Importance of a Business Plan in Entrepreneurship

1. Provides Clear Direction:
 - A business plan helps entrepreneurs stay focused on their goals and objectives, ensuring they have a clear path to follow.
2. Attracts Investors:
 - Investors or lenders want to see a solid plan before they put money into a business.
 - A well-written business plan shows them the potential for success.

3. Helps with Decision-Making:
 - With a business plan, entrepreneurs can make better decisions by having a clear understanding of their market, resources, and financial needs.
4. Risk Management:
 - It helps identify potential challenges and risks, allowing the entrepreneur to plan strategies to overcome them.
5. Measures Progress:
 - A business plan helps track business growth and performance by setting goals and benchmarks.
6. It helps a business person to avoid mistakes.
7. It enables one to identify strength and weakness of a business.

Components of a Business Plan

1. Executive Summary:
 - A brief overview of the business plan, summarizing the business idea, mission, and goals.
 - It's usually written last but placed at the beginning of the plan.
2. Business Description:
 - Describes what the business does, its mission, and the problems it aims to solve for customers.
 - This section explains the business's purpose and the value it offers.
3. Market/Competitor Analysis:

- This section provides research about the market the business will operate in, including the target audience and key competitors.

- It shows how the business will stand out from its competitors.

4. Products and Services:

- Describes the products or services the business will offer, including how they solve problems for customers.

- It also covers the unique selling points and benefits of the product or service.

5. Marketing Plan:

- Outlines the strategy to promote and sell the business's products or services.

- It includes marketing tactics, pricing, distribution, and how to reach customers effectively.

6. Financial Projection:

- Provides an estimate of the business's financial future, including income, expenses, and profits.

- It helps the entrepreneur understand the financial needs and the potential for profitability.

Use of a Business Plan in Entrepreneurship

1.Guidance for Startups:

- It helps new entrepreneurs understand the steps to take

and resources needed to launch the business.

2. Funding and Loans:

- A business plan is used to apply for loans or funding from banks, investors, or government programs.

3. Tracking Business Growth:

- Entrepreneurs use the business plan to compare their actual performance with their goals and make adjustments.

4. Risk Mitigation:

- It helps identify and plan for potential risks and challenges that could affect the business.

Business Plan Template

Here is a simple template for creating a business plan:

1. Executive Summary

- Business name and location
- Mission statement
- Brief description of products or services
- Business goals and objectives
- Business Description

2. Overview of the business and industry.

- The problem your business solves
- Target market and customer base
- Market/Competitor Analysis

3. Description of the target market

- Analysis of competitors
- Market trends and customer needs

- Products and Services

4. Detailed description of products or services
 - How your products/services benefit customers
 - Pricing and unique selling proposition
 - Marketing Plan
 5. Marketing strategies (advertising, social media, etc.)
 - Sales strategy (how you will sell your products/services)
 - Customer relationship management
 6. Financial Projections
 - Start-up costs
 - Projected income and expenses
 - Break-even analysis
 - Profit and loss forecast
- ❖ By following this template, entrepreneurs can create a well-organized plan to help guide the success of their business.