Targeter CBE PathFinder Answer Booklet

PRETECH

GRADE 7 8 9

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CONTENTS

PRETECHNICAL STUDIES

PATHFINDER PRE-TECHNICAL STUDIES ANSWERS

1.0 FOUNDATIONS OF PRE-TECHNICAL STUDIES

1.1 Introduction to pre-technical studies

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1. **Components of pre-technical studies;**
   (a) Business studies
   (b) Computer studies
   (c) Pre-technical studies
2. a) Pre-technical studies
   (b) Problem solving
3. Can help a learner in knowing and understanding how to safely search important information on the internet.
4. Business studies
5. Helps the learner to be; innovative and confident in handling everyday challenges
6. **Roles of pre-technical studies;**
   (a) Promotes practical problem-solving skills used in daily life.
   (b) Teaches basic technical skills such as measuring, tool use, and maintenance.
   (c) Promotes safe practices in both school projects and future workplaces.
   (d) Encourages self-reliance through exposure to hands-on tasks.
   (e) Helps learners contribute to their community by applying useful skills
7. Learners can use the knowledge gained in entrepreneurship and marketing of goods and services in starting their own businesses.
8. Learners can start projects that can solve problems or challenges facing their community.
9.

Column A	Column B
Pre-Technical Studies	Understanding how to manage money, trade goods and run enterprises
Computer Science	Learning to create programs and solve problems using technology
Business Studies	Gaining hands-on skills like using tools and working on simple project

10. Learning pre-technical studies teaches basic technical skills, use of technology and builds financial awareness through budgeting, saving and spending wisely.

1.2 Safety in the immediate environment

1. Safety refers to the state of being protected from danger, risk or injury caused by self or people around you. This is a situation where one avoids causing harm, discomfort or sickness to self and to others when carrying out the daily activities.
2. **Safety measured observed:**
   Using equipment properly
   (a) Following safety signs and warnings
   (b) Using the right tool for the right task
   (c) Avoiding running in the work environment.
3. **Online threats;**
   (a) Phishing
   (b) Cyberbullying
   (c) Hacking

4. **Protecting personal and sensitive data from the public when online.**
   (a) Avoiding clicking suspicious links and downloads
   (b) By not accepting friend requests from strangers
5. **Online safety threats learned**
   (a) Impersonation
   (b) Ransomware
   (c) Cyberbullying
   (d) Malware/virus attacks
6. **Three Importance of Observing Safety in the Immediate Environment**
   (a) Prevents injuries and accidents
   (b) Protects property and equipment from damage
   (c) Promotes peace, order and confidence in shared spaces
7. **Three online safety tips Kamau and his friend might embrace**
   (a) Avoid sharing personal information like ID numbers or passwords while online
   (b) Report suspicious messages or websites to a trusted adult
   (c) Log out from the accounts after using public computers
8. **Potential safety threats in different work environment**
   (a) School Bus Driver - Road accidents, poor weather, reckless drivers
   (b) Baker - Burns from ovens, slipping on wet floors, cuts from sharp tools
   (c) Carpenter - Injuries from saws or hammers, dust inhalation, falling objects
   (d) Welder - Eye damage from bright light, burns, electric shock
   (e) Plumber -Slippery surfaces, exposure to dirty water, falling from heights
9. **Three potential physical threats to a laptop**
   (a) Spilling liquids like water or juice on the keyboard
   (b) Dropping the laptop on a hard surface
   (c) Overheating due to blocked air vents or poor ventilation
10. **Suspicious Message on a Student's Phone**

(a) Possible Online Threat:

- Phishing or scam message - trying to trick the learner into clicking a harmful link or giving personal information

(b) Advice to a Friend:

- Do not click on the link or reply to the message
- Show the message to a teacher, parent, or trusted adult immediately
- Block the sender and report the message if possible

1.3 Computer Concepts

1. Definitions of Technology Terms

(a) Computer - An electronic device that processes data and performs tasks according to instructions.
(b) Data - Raw facts or figures that have not yet been processed.
(c) Information -Processed data that is meaningful and useful.

2. **Four common characteristics of a computer and their use**

(a) Speed - A computer works very fast, helping users complete tasks quickly.
(b) Accuracy - It gives correct results when instructions are followed properly.
(c) Storage - It can store large amounts of data for future use.
(d) Multitasking - A computer can perform many tasks at the same time, saving time and effort.

3. **Meaning of reliable when describing a computer**

Reliable means that the computer works well and gives correct results consistently when used properly.

4. **Importance of accuracy and storage in a school computer**

(a) Accuracy - Ensures that learners' marks, records and reports are correct.

(b) Storage - Allows the school to keep many files and documents safely for a long time.

5. **Classification of Computers**

(a) A bathroom scale with a pointer - Analog

(b) A smart fitness watch - Hybrid

(c) A classroom laptop - Digital

6. **Matching devices to their categories**

(a) Smartphone - Size

(b) Bank server - Purpose

(c) Library desktop computer - Functionality

7. **Three steps to type and save a paragraph on a desktop Computer**

(a) Open a word processing program like Microsoft Word.

(b) Type the paragraph using the keyboard.

(c) Click "Save as," choose a folder, type a file name, and click "Save".

8. **Two tasks easier on a Laptop than a Smartphone**

(a) Typing long assignments - A laptop has a full keyboard, making typing faster and easier.

(b) Viewing large documents - A laptop screen is bigger, making it easier to read and edit files.

9. **One use for each computer in everyday life**

(a) Smartphone - Sending and receiving messages.

(b) Desktop computer - Preparing school reports or assignments.

(c) Automated Teller Machine (ATM) - Withdrawing or depositing money.

10. **Two reasons why both devices are useful in school**

(a) Office computers store large amounts of learner's data safely and can be used for printing reports.

(b) Teacher tablets help in quickly recording attendance and accessing learning materials in class.

1.4 Fire Safety

1. **Bruce's answer on fire safety**

Definition: Fire safety means taking steps to prevent fire and knowing how to stay safe if one happens.

Reason: It helps protect people, property and the environment from damage or injury.

2. **What John must include about fire being useful and dangerous**

(a) **Useful:** Fire can be used for cooking, warmth, and lighting.

(b) **Dangerous:** Fire can cause injuries, destroy property, and lead to loss of life if uncontrolled.

3. **Three possible causes of fire outbreaks in school**

(a) Faulty electrical wiring

(b) Careless handling of flammable materials

(c) Playing with matches or candles

4. **Two causes of fire at the fuel station**

(a) Presence of flammable petrol

(b) Ignition from the burning cigarette butt

5. **Two electrical faults that could cause fire at home**

(a) Overloaded sockets or extension cables

(b) Exposed or damaged electrical wires

6. **Hazard and preventive measures in Sarah's kitchen**

(a) Hazard: Storing kerosene cans near an open flame can cause fire or explosion.

(b) Preventive measures:

I. Store kerosene away from heat sources in a cool and dry place

II. Use proper containers with tight lids and keep them sealed

7. **Firefighting Methods Table**

- **Cooling** - Reduces the temperature of the fire using water or other cooling agent
- **Starving** - Removing the fuel source so the fire cannot continue burning
- **Interrupting** - Breaking the chemical reaction that keeps the fire burning
- **Smothering** - Covering the fire to block oxygen and stop it from spreading

8. **Jane's answer on the safest firefighting method**

(a) **Method:** Cooling

(b) **Reason:** It is safe and easy to use, especially with water and helps reduce heat quickly.

9. Four practical steps to prevent fire from combustible waste at home

(a) Sweep and collect dry leaves and paper regularly

(b) Store waste in closed bins away from heat sources

(c) Avoid burning waste near buildings or trees

(d) Keep matches and lighters away from children

10. Danger and Immediate Action for the Technician

- **Danger:** Risk of fire or explosion due to sparks near flammable chemicals
- **Action:** Turn off power immediately and remove chemicals from the area; report the fault for repair

1.5 Data Safety

1. Aisha's Answers

(a) Data - Raw facts or figures that have not yet been processed.

(b) Information - Data that has been organized and made useful.

2. Four reasons why data is important in an electronic device

(a) It helps the device perform tasks correctly.

(b) It stores useful records like schoolwork or contacts.

(c) It allows users to make decisions based on facts.

(d) It supports communication and sharing of ideas.

3. **Common threats to data and examples.**

Virus/Malware - Downloading an infected game that deletes homework file

Accidental deletion - A learner mistakenly deletes a saved assignment

Theft - A phone with school notes is stolen from a bag

Power failure - Sudden blackout causes unsaved work to be lost

4. **Two threats to data on the nurse's tablet**

(a) Unauthorized access by someone who guesses the password

(b) Loss or damage of the tablet due to theft or accident

5. **Fill in the Blanks**

(a) Keeping family photos safe from unauthorized viewing when a phone is lost: **Encryption**

(b) Ensuring that any malicious software already on a school computer is detected and removed: **Antivirus**

(c) Making sure critical project files can be recovered after a tablet breaks: **Backup**

(d) Requiring a learner to log in before accessing desktop: **Password**

6. **Two precautions when using public Wi-Fi**

(a) Avoid logging into sensitive accounts like banking or school portals

(b) Use a secure connection or VPN to protect personal data

7. **Tina's instructions for setting a strong password**

(a) Use at least eight characters

(b) Combine letters, numbers, and symbols

(c) Avoid using names or birth dates

(d) Change the password regularly

8. **Risk of keeping notes only in downloads folder**

- If the phone is lost, damaged or reset, all notes may be permanently lost without a backup.

9. Three Types of Fixed Storage for Backups
   1. Internal Hard Drive
   2. Solid State Drive
   3. Internal Flash Memory

10. **Umoja learners' explanation of how Antivirus works**

Antivirus is a program that scans a device to detect, block and remove harmful software like viruses and malware.

1.6 Safety on Raised platforms

1. **Why it's important to observe safety on raised platforms (James' situation)**

(a) To prevent falling and getting injured while using the ladder

(b) To ensure the ladder is stable and won't collapse during use

(c) To avoid slipping by wearing proper shoes with good grip

2. Ladder image analysis

(i) Two unsafe things observed:

(a) The ladder is leaning directly on the wall without proper support

(b) The person is climbing without visible safety gear

(ii) Two safety measures to improve ladder use:

(a) Place the ladder on a flat, stable surface and secure it at the top

(b) Wear non-slip shoes and have someone hold the base of the ladder

3. **Three types of raised platforms and one risk each**

(a) **Ladder** - Risk of falling if not properly balanced or supported

(b) **Bench** - Risk of tipping over if used for standing instead of sitting

(c) **Step stool** - Risk of slipping if placed on a wet or uneven floor

4. Trestle Use in Carpentry

(a) Type of Platform:

A trestle is a temporary raised support used to hold materials like timber during cutting or shaping.

(b) Two Safety Precautions:

- Ensure the trestle is strong and stable before placing heavy timber
- Keep the area around the trestle clear to avoid tripping hazards

5. Image showing workers working on a raised platform that has no guardrails

6. Scaffold Image Analysis

(a) Risk Present:

- People may fall due to lack of guardrails or unstable scaffold structure

(b) Two Protective Features to Add:

- Guardrails to prevent falling
- Toe boards to stop tools or materials from slipping off

7. **Dangers of unsafe raised platforms**

(a) Wet or slippery surfaces:

- Can cause slipping and falling, leading to serious injuries

(b) Loose or cracked boards:

- May break underweight, causing the person to fall or get hurt

8. **Three safety measures when working on raised platforms**

(a) Inspect the platform for cracks, loose parts or damage

(b) Wear proper footwear with good grip

(c) Avoid overloading the platform with too much weight

9. **Image analysis**

(a) **Type of raised platform:**

- Staircase

(b) **One advantage and one safety risk.**

- Advantage: Easy and safe to climb when used properly
- Risk: May cause falls if steps are wet or not well lit

10. **Work bench used by technician**

(a) Two things to check:

- That the bench is stable and not wobbly
- hat the surface is clean and free from sharp or loose objects

(b) Protective gear to wear:

- Safety goggles and gloves

11. Safety measures for drama club using a raised stage

(a) Ensure the stage is strong and stable before use

(b) Keep the edges marked or guarded to prevent falls

(c) Avoid running or jumping on the stage during rehearsals

1.7 Handling Hazardous Substances

1. **Why hazardous containers have warning labels**

- To alert users about the dangers of the substance and guide them on how to use it safely.

2. **Three safe ways to handle hazardous substances**

(a) Wear protective gear like gloves or masks when using them

(b) Store them in a clearly labelled containers away from children

(c) Follow the instructions and safety warnings on the label

3. 

4. **Musa's bottle under the sink**

(a) A pesticide

(b) It may be poisonous or harmful if touched, inhaled or swallowed

5. **Group of hazardous substances:**

(a) Corrosive substances

(b) One Safety Rule:

- Use gloves and avoid mixing it with other cleaners.

6. Flammable Substances at Home

(a) Two Examples:

- Kerosene
- Methylated spirit

(b) Safe Storage:

- Store kerosene in a sealed container away from heat
- Keep methylated spirit in a cool, dry place with a tight lid

7.**(a) Group of hazardous substances:**

- Corrosive substances

(b) Immediate action:

- Wash the skin with plenty of clean water and seek medical help

8. **John and Methylated Spirit**

(a) Importance of reading instructions:

- To know how to use it safely and avoid accidents

(b) Possible danger:

- He might use too much or near a flame, causing burns or fire

9. **Safety poster tips**

(a) Always read labels before using any chemical

(b) Wear gloves and masks when handling dangerous substances

(c) Store hazardous items out of children's reach

10. **Two reasons to observe safety rules in the community**

(a) To prevent accidents, injuries or poisoning

(b) To protect the environment and other people from harm

11. **Two reasons for labelling hazardous substances**

(a) To warn users about the dangers of the substance

(b) To give clear instructions on safe use and storage

12. **Three ways to handle hazardous substances safely**

(a) Use protective clothing like gloves and aprons

(b) Keep them in original containers with labels

(c) Dispose them off properly according to instructions

1.8 Self exploration and Career Development

1. **Definition of self-exploration**

- Self-exploration is the process of discovering your interests, strengths and values.
- Importance: It helps young people make better choices about their future careers and personal goals.

2. **Suitable career pathway for Peter**

Career Pathway: STEM (Science, Technology, Engineering, and Mathematics)

Reason: Peter enjoys working with machines and tools, which matches careers like engineering or technical work.

3. **Two talents and matching careers**

(a) Drawing - Career: Graphic Designer

(b) Public Speaking – Career: News Reporter

4. **Girl painting a bird**

(a) Talent Used: Artistic talent (drawing and painting)

(b) Possible Career: Artist, illustrator or fashion designer

5. **Two ethical ways learners can use their talents**

(a) Performing in school events like drama or music festivals

(b) Volunteering skills to help others, such as tutoring or decorating community spaces

6. **How Mary can nurture her talents**

- She can join drama and music clubs, attend workshops and practice regularly to improve her performance skills.

7. Talent, career pathways and possible creers

Talent: Public Speaking

Career Pathway: Social Sciences

Possible Career: Lawyer or News Reporter

Talent: Problem solving

Career Pathway: STEM

Possible Career: Engineer

Talent: Drawing and Painting

Career Pathway: Creative Arts

Possible Career: Artist or designer

8. Boy presenting with a Computer

(a) Ability used: Communication and digital presentation skills

(b) Matching Career: ICT specialist or digital content creator

9. **Two reasons to choose a career based on talents**

(a) It increases the chances of success and satisfaction in the job

(b) It allows the person to enjoy their work and grow their skills naturally

10. **Copying and sharing a music video**

(a) Unethical use of talent

(b) Possible consequence: The video might be removed from the internet, and people may stop trusting the learner online.

2.0 COMMUNICATION IN PRE-TECHNICAL STUDIES

2.1 Introduction to drawing

1. A drawing is a picture or diagram made using lines to show an object, idea or design.

2. Importance of drawing

(a) It helps to express ideas clearly.

(b) It is used to plan and design objects.

(c) It helps in learning shapes and structures.

(d) It is used to communicate without words.

(e) It builds creativity and observation skills.

3. Two types of drawings and explanation:

(a) Artistic drawing - shows feelings, beauty or imagination.

(b) Technical drawing - shows exact size, shape and details for making things.

4. **Five differences between artistic and technical drawings:**

(a) Artistic drawings shows feelings; technical drawings shows exact details.

(b) Artistic drawings may not follow scale; technical drawings must follow scale.

(c) Artistic drawings use many colours; technical drawings use standard colours.

(d) Artistic drawings follow few rules; technical drawings follow strict rules.

(e) Artistic drawings are used in decoration; technical drawings are used in building and design.

5. Printing is writing letters or words clearly using drawing tools, often in capital letters, for neatness and easy reading.

6. **Two ways to print letters in drawing:**

(a) Freehand printing - writing letters by hand without tools.

(b) Instrumental printing - using tools like rulers or templates to make neat letters.

7. **Types of continuous lines:**

(a) Continuous thick lines - used for visible outlines.

(b) Continuous thin lines - used for dimensions and hatching.

(c) Thin continuous with zigzag - used to show a break in an object.

(d) Thin continuous irregular or freehand - used for short notes or limits.

Types of lines for specific uses:

(a) Centre lines – thin long-dash short-dash lines.

(b) Visible lines – continuous thick lines.

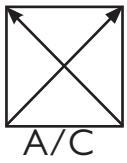
(c) Short lines – continuous thin lines.

(d) Hidden lines – short-dashed lines.

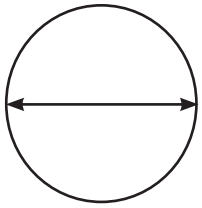
9. **Drawing symbols**

(a) Across flats

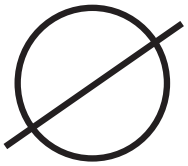
(b) Across corners –



(c) Inner diameter –



(d) Outer diameter –



10. **Four importance of drawing as a means of communication:**

(a) It explains ideas that are hard to describe with words.

(b) It helps in planning buildings, machines and tools.

(c) It allows people to understand messages without speaking.

(d) It gives clear instructions for making or building things.

2.2 Freehand Sketching

1. Free hand sketching is drawing by hand without using drawing tools like rulers or compasses.

2. Importance of free sketching:

(a) It helps express ideas quickly.

(b) It improves creativity and imagination.

(c) It helps in planning and designing objects.

(d) It is used to communicate ideas visually.

3. Three freehand sketching methods used in Pre-Technical Studies:

(a) Hatching

(b) Cross hatching

(c) Stippling

4. Freehand techniques explained:

(i) Hatching – drawing many straight lines close together to show shading.

(ii) Cross hatching – drawing lines that cross each other to make darker shading.

(iii) Stippling – using small dots to show texture or shading.

(iv) Blending – smoothing pencil marks to create soft shading.

5. Three types of lines James uses in drawing:

(a) Straight lines

(b) Curved lines

(c) Zigzag lines

6. Meaning of 'two-dimensional' shape:

A two-dimensional shape is a flat shape that has only length and width.

7. Three 2D forms Anita came across:

(a) Circle

(b) Square

(c) Triangle

8. Application of freehand sketching in careers:

(i) Cartoons and animations – used to create characters and scenes.

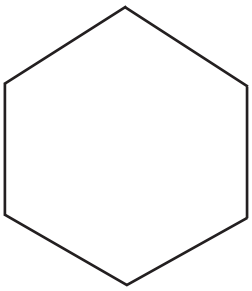
(ii) Architecture – used to draw building plans and ideas.

(iii) Composite – used to sketch faces or objects in investigations.

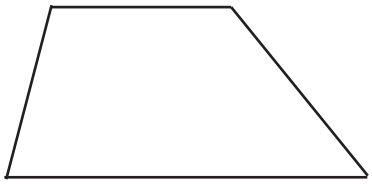
(iv) Engineering – used to design machines and tools before making them.

9. Sketch the following 2D forms using freehand:

(i) Hexagon - draw a six-sided shape with equal sides.



(ii) Trapezium - draw a shape with one pair of parallel sides and one pair not parallel.



(**Note: Learners should draw these by hand in their books.**)

10. Learner's personal answer - a career based on learner's talent or interest.)

2.3 ICT Tools in Communication

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1. An ICT tool is any device or software that helps people share, store or find information.
2. **Three ICT tools for collaboration (John's answer):**

(a) Email

(b) Video conferencing

(c) Shared documents (e.g. Google Docs)

3. **Two importance of sending a chat message to a private email:**

(a) The message is more secure and private.

(b) It allows the receiver to reply at their own time.

4. **Two advantages of video conferencing for learners:**

(a) Learners can attend lessons from anywhere.

(b) They can ask questions and get answers in real time.

5. **Jane's safest ICT tool for urgent updates and reason:**

- She chose the mobile phone because it allows fast calling or texting, even without internet.

6. **Four steps for secure communication on social media:**

(a) Use strong passwords.

(b) Avoid sharing personal details.

(c) Only accept known contacts.

(d) Log out after using shared devices.

7. **TRUE or FALSE answers:**

(a) Online collaboration platforms require real-time internet access to functionTRUE

(b) A clear subject line in an email guarantees the recipient will open the message. FALSE

8. **How ICT tools reduce paper waste (Utumishi School):**

(a) Learners can type and share notes digitally.

(b) Teachers can send assignments online instead of printing.

(c) Exams and reports can be stored electronically.

9. **Two collaboration tools and justification:**

- Google Docs - allows many users to edit the same document at once.
- Microsoft Teams- supports chatting, meetings and sharing files in one place.

10. **Two disadvantages of too much ICT use in children:**

- It may reduce physical activity and cause health problems.
- It can lead to poor social skills if they spend less time with others.

2.3 Plane Geometry

1. **Drawing instruments**

(a) Ruler – used to draw straight lines and measure lengths.

(b) Compass – used to draw circles and arcs.

(c) Protractor – used to measure and draw angles.

(d) Set square – used to draw vertical and inclined lines.

(e) Pencil – used to sketch and shade drawings.

2. **Kevin needed the following instrument to draw multiple parallel horizontal lines**

(a) He chose a T-square.

(b) It is suitable because it helps draw straight, parallel horizontal lines quickly and accurately.

3. **Tool Amina used;**

(a) She used a divider.

(b) It helps pick and transfer exact lengths between parts of a drawing.

4. **Title block and information it must contain.**

(a) A title block is a box in a drawing that shows key information about the drawing.

(b) It must contain:

(i) Name of the student or drafter

(ii) Title of the drawing

(iii) Date of the drawing

5. **Examples provided by Leah;**

(a) Perpendiculars – used to draw walls or supports at right angles.

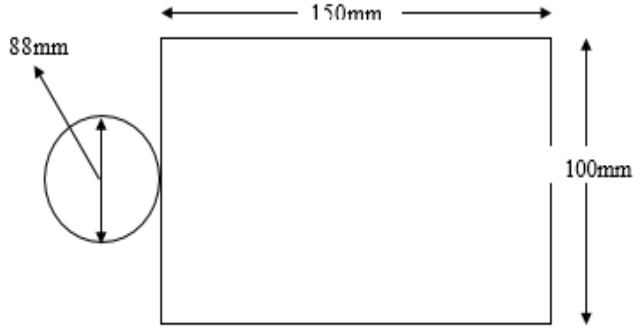
(b) Circles – used to design wheels, pipes or round windows.

6. **Daniel used;**

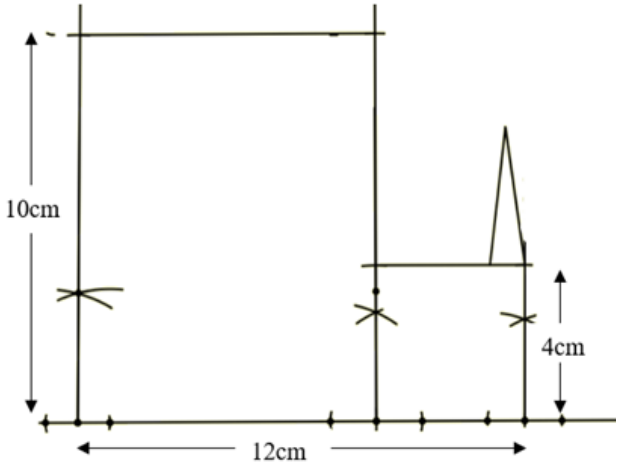
(a) A pair of compasses to draw arcs from both ends of the doorway's width to locate the center.

(b) This method is part of the perpendicular bisector construction, which helps find the midpoint and center for drawing a semicircle.

7. **Circle and rectangle drawing**



8. **Construction of combined shapes**



9. **Difference between H grade pencils and B grade pencils**

(a) H-grade pencils make light and thin lines, good for technical drawing.

(b) B-grade pencils make dark and thick lines, good for shading and sketching.

10. **Equipment with combined shapes**

(a) Cooking pot – cylinder and circle.

(b) Cup – cylinder and handle.

(c) Table – rectangle and cylinder legs.

(d) Wall clock – circle and rectangle frame.

(e) Torch – cone and cylinder.

2.5 Dimensioning

1. **Purpose of dimensioning**

(c) To communicate the exact size and shape of an object.

2. **Name of line showing measurement extent**

(c) Dimension line

3. **Symbol Ø represents**

(b) Diameter

4. **Ideal placement of dimensions**

d) Outside the object, away from the view

5. **Difference between extension and dimension lines**

(a) Extension lines extend from the object to show where a measurement begins and ends.

(b) Dimension lines sit between extension lines and carry the measurement value with arrowheads.

6. **Reasons for leaving a gap before extension lines**

(a) To avoid confusion between the object and the extension line.

(b) To make the drawing clearer and more professional.

7. **Chain dimensioning and its disadvantage**

(a) Chain dimensioning places measurements in a continuous line, one after another.

(b) A disadvantage is that small errors can add up, affecting the total length.

8. **Why not to repeat dimensions**

(a) It can confuse the reader.

(b) It may lead to mistakes during construction or interpretation.

9. **Applying dimensions on a rectangle**

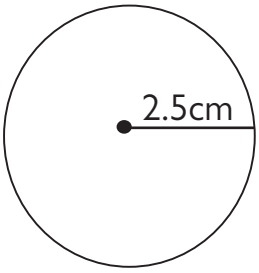
i. Use extension lines from each corner.

ii. Draw dimension lines outside the shape with arrowheads.

iii. Label with dimension figures (e.g. 100 mm, 60 mm).

10. **Drawing a circle of radius 2.5 cm**

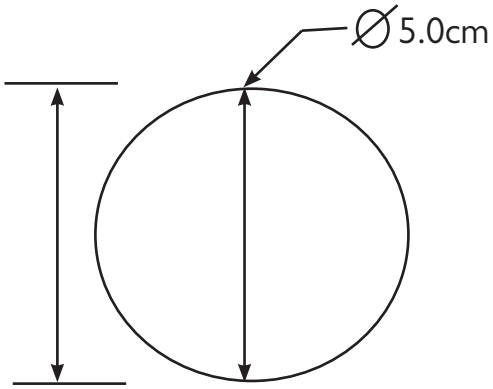
- Use a compass to draw a circle from a center point with a 2.5 cm radius.



11. **Adding diameter dimension to the circle**

(a) Draw a dimension line across the circle.

(b) Add arrowheads and label it Ø5.0 cm.



2.6 Plain Scale Drawing Page 113

Assessment Questions 1

1. Drawing length using scale 1 cm = 1 m

- 8 m ÷ 1m/cm = 8 cm on the drawing.

2. Real distance from scale ratio 1:100

- 6 cm × 100 = 600 cm = 6 m in real life.

3. Real length of table from drawing

- 7 cm × 10 cm = 70 cm actual length.

4. **Reason for dividing first unit into smaller parts**

(a) To measure and show smaller units accurately.

(b) It improves precision in reading and marking distances.

5. **Paper length for scale 1:200 up to 40 m**

- 40 m ÷ 200 = 0.2 m = 20 cm on paper.

6. **Real-life distance from 0 to point A**

- Point A is placed exactly at the 1-metre mark. Therefore: Real-life distance from 0 to point A = 1 metre

7. **Drawing length for 45 m road at 1 cm = 5 m**

- 45 m ÷ 5 m/cm = 9 cm on the drawing.

8. **Meaning of scale 1:50**

- Every 1 unit on the drawing represents 50 units in real life.
- It is a reduced scale used for large areas.

9. **Scale of 1:100 to measure up to 10 m**

(a) 10 m x 100 ÷ 100 = 10 cm scale length on paper.

(b) Divide into 5 equal parts, each representing 2 m.

10. **Features of a plain scale**

(a) The first unit on the left is subdivided into smaller equal parts.

(b) The zero (0) is placed at the start of the subdivisions.

(c) The main units are numbered to the right from the zero.

(d) Used to represent a unit and its next smaller subdivision.

11. **Importance of numbering main units**

- Helps in reading measurements correctly.
- Prevents confusion and errors during interpretation.

Assessment Questions 2

1. **Meaning of terms in plain scale drawing**

(a) Scale – the ratio between the drawing size and the actual size of an object.

(b) Plain scale – a straight line divided into equal parts to measure distances in one unit (e.g., metres).

(c) Scale drawing - a drawing that shows an object in correct proportion but reduced or enlarged in size.

2. **Features of a plain scale**

(a) It has a main scale and a sub-division.

(b) It shows only one unit (e.g. metres or kilometres).

(c) It has a zero point at the junction of the main and sub-scale.

(d) It includes a label showing the scale used (e.g. Scale 1:100).

3. **Meaning of scale types**

(a) Enlarged scale – used when the object is small and needs to be drawn bigger than actual size.

(b) Reduced scale – used when the object is large and needs to be drawn smaller than actual size.

(c) Full scale – used when the drawing is the same size as the actual object.

4. **Calculating representative fraction (R.F)**

(a) 1 cm represents 3.5 m = 1 cm : 350 cm

(b) R.F = 1 / 350

5. **Possible errors when constructing a plain scale**

(a) Using the wrong scale ratio.

(b) Inaccurate measurements or divisions.

(c) Poor labelling or missing units.

(d) Not starting from zero or misplacing the zero point.

6. **Meaning of R.F values**

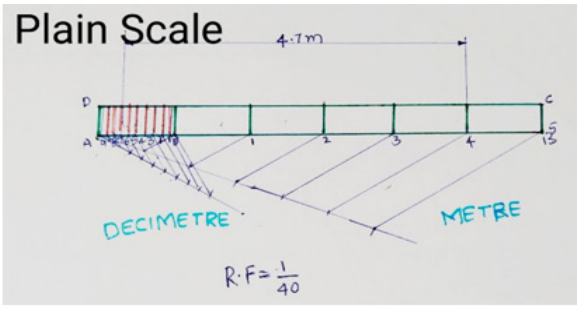
(i) R.F = 1:200 means 1 unit on the drawing represents 200 units in real life.

(ii) R.F = 1:1500 means 1 unit on the drawing represents 1500 units in real life.

7. **Use of a plain scale in drawing**

- It helps measure and mark real-world distances accurately on a scaled drawing.

8. **Drawing a plain scale**



9. **Importance of drawing to scale**

(a) Ensures accuracy in measurements.

(b) Helps in planning and construction.

(c) Makes large or small objects easier to represent.

(d) Allows clear communication of design ideas.

10. **Career preference**

(Learner's personal response)

- Example: I would like to pursue a career in architecture because I enjoy drawing buildings.

2.7 Oblique Projections

1. Characteristics of oblique projection

(a) Shows the front face in true shape and size.

(b) Depth lines are drawn at an angle (usually 45°).

(c) Allows quick and clear visualization of objects.

(d) Suitable for technical sketches without complex instruments.

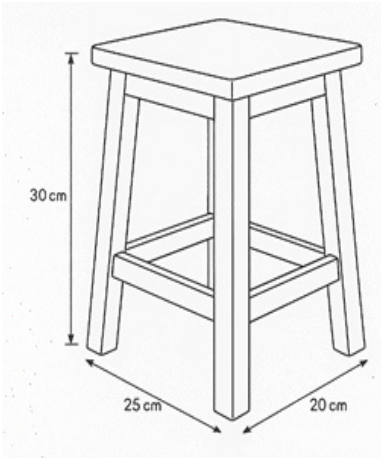
2. Cabinet projection of a wooden stool

(Learners should draw by hand)

(a) Draw the front face: 30 cm tall × 25 cm wide.

(b) Use 45° angle lines to show 20 cm depth, but reduce depth by half (10 cm).

(c) Complete the top and side faces using parallel lines.

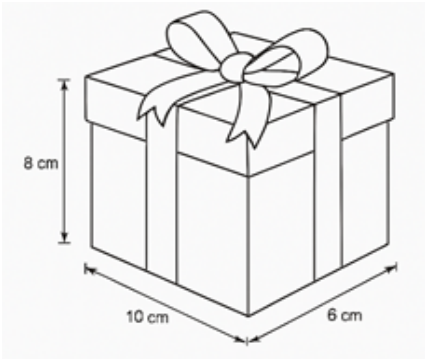


3. **Cavalier projection of a gift box**

i. Draw the front face: 10 cm × 8 cm.

ii. Use 45° angle lines to show full 6 cm depth.

iii. Complete top and side faces with parallel lines.



4. **Identifying cabinet vs cavalier blocks**

(a) Block i) is cabinet, Block ii) is cavalier.

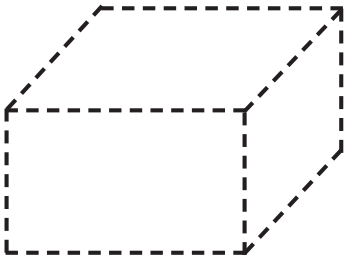
(b) Cabinet projection reduces depth by half; cavalier shows full depth.

(c) Cabinet gives a more realistic view because depth is visually balanced.

5. **Brick sketch in cabinet projection**

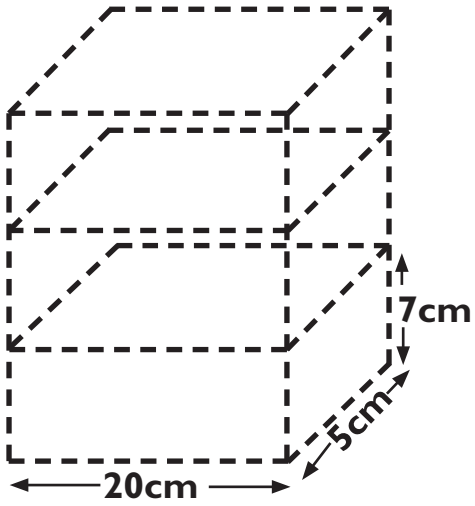
(a) Draw front face: 20 cm × 7 cm.

(b) Use 45° angle lines to show 10 cm width, reduced to 5 cm.



(a) Stack three more bricks slightly above the first.

(b) Label: Length = 20 cm, Width = 10 cm reduced to 5cm, Height = 7 cm.



6. **Oblique view of classroom desk**

(a) Cabinet projection is used.

(b) It shows realistic depth, helping designers visualize furniture size and placement.

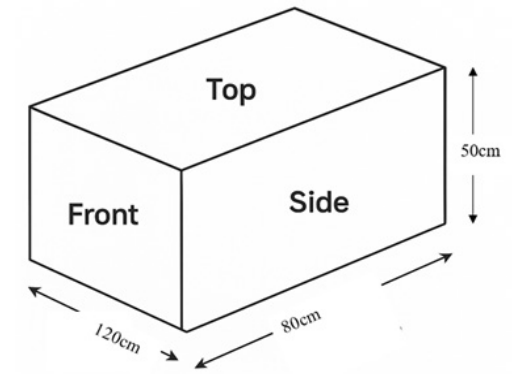
7. **Cavalier projection of rooftop water tank**

a. Draw front face: 120 cm × 80 cm.

b. Use 45° angle lines to show full 50 cm depth.

c. Label front, top, and side faces.

d. Cavalier projection helps technicians see full depth for installation planning.



8. **Oblique projection of pencil holder (cylinder)**

i. Draw vertical sides of 10 cm height.

ii. Top face as an ellipse with 6 cm diameter.

iii. Connect sides smoothly.

iv. Slightly shade and label height and diameter.

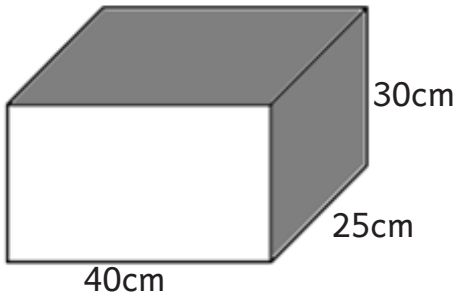
9. **Cabinet projection of microwave oven**

(a) Draw front face: 40 cm × 25 cm.

(b) Use 45° angle lines to show half of 30 cm depth = 15 cm.

(c) Label all dimensions clearly.

(d) Shade top and right faces lightly.



2.8 Visual Programming 1

1. **Definitions in visual programming**

(a) Visual programming – creates programs by arranging graphical blocks instead of writing text code.

(b) Block – a pre-built command or instruction used to control actions in a program.

(c) Stage – the area where animations, sprites, or outputs are displayed during execution.

2. **Category of Grace's app and example**

- Educational visual programming application.
- Example: Scratch.

3. **Key features of visual programming environments**

- Drag-and-drop interface - allows users to build programs by moving blocks.
- Sprites and stage – visual elements that show actions and feedback.
- Event blocks - trigger actions based on user input or system events.

- Real-time execution - lets learners see immediate results of their code.

4. **Highlighted feature in teacher's example**

- Event handling- triggered by clicking the green flag.

5. **Importance of drag-and-drop and real-time feedback**

- Drag-and-drop prevents syntax errors and helps beginners focus on logic.
- Real-time feedback shows results instantly, helping learners understand cause and effect.

6. **Classification of visual programming tools**

(a) Scratch - Educational

(b) Alice - Multimedia

(c) Construct 3 - Game- Focused

7. **Categorizing components by role**

- "Ask [What's your name?] and wait" – Input
- "Repeat 10" – Processing
- "Say [Hello!] for 2 seconds" – Output

8. **Easier tasks on tablet using block-based apps**

(a) Animating characters by dragging motion blocks.

(b) Controlling sensors or lights on micro: bit with simple block commands.

9. **Benefits of visual programming in daily life**

(a) Improves problem-solving skills.

(b) Encourages creativity through storytelling and design.

(c) Makes coding accessible to beginners.

(d) Helps in understanding logic and sequences.

10. Benefit of using both Scratch and Make Code

- Scratch builds creativity and storytelling skills.
- Make Code teaches hardware interaction and real-world problem solving.
- Together, they support both artistic and technical learning.

11. Category and platform for robotics workshop

- Educational and hardware-focused visual programming.
- Platform: Microsoft Make Code.

2.9 Visual Programming 2

1. **Meaning of visual programming and how it differs**

- Visual programming is creating programs by arranging blocks or icons instead of typing code.
- It differs from text-based programming because it uses drag-and-drop blocks, not long typed commands.

2. **Examples of visual programming software**

(a) Scratch

(b) Microsoft MakeCode

(c) Sprite box

3. **Matching problems to project types**

(a) Teaching road safety - A. Animated story

(b) Practicing maths skills - B. Educational game

(c) Celebrating cultural events - C. Interactive animation

4. **Features that make visual programming easier**

(a) Drag-and-drop blocks prevent typing errors.

(b) Blocks fit together only in correct ways, guiding logic.

(c) Real-time feedback helps learners see results immediately.

5. **Three things that will happen when the green flag is clicked**

(a) The sprite's colour effect will change repeatedly, creating a flashing or shifting colour animation.

(b) There will be a short pause (0.2 seconds) between each colour change, making the effect smooth and visible.

(c) After the loop finishes, the sprite's graphic effects will be cleared, returning it to its original appearance.

6. **Digital health campaign project**

(a) Type of project: Animated story or interactive poster.

(b) Features to make it interesting:

(i) Use of talking sprites with health tips.

(ii) Background changes to show different health scenes.

7. **Sprite-based project and message**

(a) Project: A hygiene reminder animation.

(b) Message: "Wash your hands before eating!"

8. **Fill in the blanks**

(a) Sprites

(b) Backdrop

9. **Areas where visual programming can be applied**

(a) Education

(b) Multimedia

(c) Game development

(d) Digital storytelling

10. **Robotics and visual programming**

(a) Robotics helps learners use blocks to control sensors, motors and lights.

(b) Example project: A robot that follows a line or avoids obstacles.

3.0 MATERIALS FOR PRODUCTION

Page 150

3.1 Introduction to materials

1. **Meaning of materials in production**

- Materials are the raw substances or resources used to make products or items during manufacturing or construction.

2. **Five products made from metallic materials**

(a) Sufurias

(b) Window grills

(c) Car bodies

(d) Roofing sheets

e) Bicycle frames

3. **Five sustainable ways of using materials**

(a) Reusing materials instead of throwing them away.

(b) Recycling waste into new products.

(c) Reducing material wastage during production.

(d) Using biodegradable or eco-friendly materials.

(e) Repairing items instead of replacing them.

4. **Importance of materials**

(a)Metallic materials

- Strong and durable
- Good conductors of heat and electricity
- Can be recycled easily

(b) Non-metallic materials

- Lightweight and flexible
- Often resistant to rust or corrosion
- Used for insulation and decoration

5. **Explanation of terms**

(a) Recycle - converting waste materials into new usable products.

(b) Reuse - using an item again for the same or a new purpose.

(c) Reduce - minimizing the number of materials used or wasted.

(d) Biodegradable materials – substances that can break down naturally without harming the environment.

6. **Five non-metallic materials**

(a) Wood (b) Plastic
(c) Rubber (d) Glass
(e) Ceramics

7. **Five importance of materials in production**

(a) Provide the base for making useful products.

(b) Determine the strength and durability of items.

(c) Influence the cost of production.

(d) Affects the appearance and function of products.

(e) Enables innovation and design in manufacturing.

8. **What are metallic materials?**

- Metallic materials are substances made from metals or metal alloys known for being strong, shiny and good conductors of heat and electricity.

9. **What are non-metallic materials?**

- Non-metallic materials are substances that do not contain metal and are usually poor conductors, lightweight and used for insulation or decoration.

10. **Differences between metallic and non-metallic materials**

(a) Metallic materials are good conductors of heat and electricity, while non-metallic materials are poor conductors.

(b) Metallic materials usually have a shiny and lustrous appearance, whereas non-metallic materials tend to have a dull or non-reflective surface.

(c) Metallic materials are generally strong and hard, while non-metallic materials are often soft, brittle or flexible depending on the type.

3.2 Metallic materials Page 156

1. **Five metallic materials and their uses**

(a) Iron - used to make gates and tools

(b) Copper - used in electrical wiring

(c) Aluminium - used for making cooking pots and window frames

(d) Steel - used in construction and making machines

(e) Zinc - used for roofing sheets and galvanizing iron

2. **Experiment to test magnetic property of steel**

i. Bring a magnet close to a steel object (e.g. a nail).

ii. Observe if the steel is attracted to the magnet.

iii. If it sticks, steel is magnetic.

iv. You can also compare with non-magnetic metals like Aluminium to confirm.

3. **Four physical properties used to identify metallic materials**

(a) Shiny or lustrous surface

(b) Hard and strong

(c) Good conductors of heat and electricity

(d) Malleable (can be hammered into shape)

4. **Three commonly used metallic materials**

(a) Iron

(b) Aluminium

(c) Copper

5. **Physical properties of specific metals**

(a) Copper - reddish-brown, soft, ductile, excellent conductor of electricity

(b) Aluminium - lightweight, silver-white, resists rust, good conductor

(c) Steel - strong, hard, magnetic, silver-grey in colour

6. **Why copper is used for electrical wires instead of steel**

i. It is a better conductor of electricity than steel

ii. Copper is more flexible and easier to bend

iii. It does not rust easily, making it safer for wiring

7. **Uses of metallic materials in production**

i. Making tools and machinery

ii. Building structures like bridges and buildings

iii. Manufacturing vehicles and appliances

iv. Producing electrical components

v. Creating packaging materials like cans and foils

8. **Three physical characteristics of steel**

(a) Hard and strong

(b) Magnetic

(c) Shiny grey surface

9. Two uses of silver and gold

(a) Silver -used in jewelry and electrical conductivity

(b) Gold - used in jewelry and coating electronic components

10. **Meaning of 'sonorous'**

- Sonorous means producing a ringing or echoing sound when struck. Metallic materials like iron and copper are sonorous.

Non-Metallic Materials (Page 162)

1. Describe three uses of the following non-metallic materials

(a) Glass

- Used to make windows
- Used in laboratory equipment like beakers
- Used in bottles and mirrors

(b) Wood

- Used to make furniture
- Used in building construction
- Used for making doors and shelves

(c) Paper

- Used for writing and printing
- Used to make packaging and wrapping materials
- Used in making charts and posters

2. **Use of non-metallic materials in the following areas**

(a) Hospitals - Plastic is used to make syringes, gloves and containers

(b) Kitchen -Ceramics are used for plates, cups and tiles

(c) School laboratory - Glass is used for test tubes, flasks and measuring cylinders

3. **Five non-metallic materials found in the school environment**

(a) Wood (b) Plastic

(c) Glass (d) Rubber

(e) Paper

4. **Difference between natural and synthetic non-metallic materials**

- Natural non-metallic materials are found in nature, like wood and clay while Synthetic non-metallic materials are man-made, like plastic and nylon

5. **Relating non-metallic materials to their uses in the locality**

- Clay is used to make cooking pots and stoves
- Wood is used for building houses and making furniture
- Plastic is used for water tanks and buckets
- Paper is used in schools for writing and drawing
- Rubber is used for shoe soles and erasers

6. **Two physical properties of the following non-metallic materials**

(a) Ceramic - Hard and brittle

(b) Plastic - Lightweight and waterproof

(c) Wood - Strong and easy to cut

7. **Three characteristics of non-metallic materials**

- Poor conductors of heat and electricity
- Often lightweight and flexible
- Can be brittle or soft depending on the type

8. **What are natural non-metallic materials**

- Natural non-metallic materials are materials that do not contain metal and are found in nature, such as wood, clay, stone and sand.

9. **Why non-metallic materials are used for saucepan handles**

- They do not conduct heat easily, so they protect hands from burns during cooking.

10. **Which career would you like to pursue?**

- (Learner's own answer) – Example: I would like to become a mechanical engineer because I enjoy designing and building machines.

3.3 Composite Materials

1. **Composite materials**

- Composite materials are made by combining two or more different materials to create a stronger or more useful product.

2. **Why concrete is preferred over pure stone**

- Concrete is a composite material that is stronger, easier to shape, and more durable than pure stone. It can be poured into molds and sets quickly, making construction faster and more efficient.

3. **Type and properties of Mary's brick**

- They created a composite material. It is lightweight, strong, and provides insulation. The dry grass adds flexibility and reduces cracking in the clay.

4. **Four common uses of composite materials at home**

i. Roofing sheets

ii. Kitchen countertops

iii. Wall panels

iv. Furniture boards (e.g. plywood)

5. Meaning of constituent material

- Constituent material is one of the original substances used to make a composite. Each part contributes specific properties to the final product.

6. **Two advantages of fiberglass over wood in boats**

- Fiberglass is waterproof and does not rot easily.
- It is lighter and stronger, making boats easier to handle and more durable.

7. **How combining materials improves performance (with example)**

- Combining materials allows the final product to gain the best qualities of each. For example, concrete combines cement (strength) and sand (flexibility) to make a durable building material.

8. **Constituent materials**

(a) Roof tiles – Clay and sand

(b) Plywood board – Thin layers of wood and glue

(c) Clay cooking pot – Clay and water

(d) Carbon-fiber bicycle frame – Carbon fibers and resin

9. **Composite material for waterproof flower vases**

- Jane can use clay mixed with waterproof resin or glaze to seal the vase and prevent leaking.

10. **Example of sports equipment using composite materials**

- A tennis racket made from carbon fiber and plastic resin is a common example.

3.4 Ceramic Materials

1. **Definitions in the context of ceramic materials**

(a) Ceramic - A hard, brittle material made by heating natural substances like clay at high temperatures.

(b) Pottery - Objects made from clay and hardened by heat, such as pots, plates and vases.

(c) Kiln - A special oven used to fire and harden clay into ceramic products.

2. **Four ceramic items commonly used in a kitchen**

(a) Plates

(b) Cups

(c) Cooking pots

(d) Tiles

3. **Four physical properties of ceramic materials**

(a) Hardness

(b) Brittleness

(c) Heat resistance

(d) Smooth surface texture

4. **Difference between porcelain and earthenware.**

- Porcelain is smoother, whiter and fired at higher temperatures, making it stronger and less porous. Earthenware is more porous, rougher and fired at lower temperatures.

5. **Property illustrated when the jug** shattered

- Brittleness

6. **Classification of ceramic items by source material**

- Clay cooking pot - Natural clay
- Porcelain tea cup - Refined clay
- Shell bead made from powdered seashells
- Crushed calcium - based shells

7. **Two reasons ceramics are suitable for sanitation areas**

- They are easy to clean and do not absorb dirt.
- They resist water and chemicals, making them hygienic and durable.

8. **Two reasons ceramic cooking pots are still popular in rural areas**

- They retain heat well and cook food evenly.
- They are affordable and made from locally available materials.

9. **Three challenges without ceramic items in school facilities**

- Difficulty maintaining hygiene in toilets and sinks
- Lack of safe containers for heating substances in science labs
- Inconvenient food preparation due to missing cooking pots and plates

10. **Matching ceramic items with correct uses**

- Clay cooking pot - is used in kitchens and rural homes to prepare meals.
- Ceramic floor tile - is laid in homes and schools for durable flooring.
- Electrical insulator - prevents electric current from escaping in power lines.
- Wash basin - is installed in bathrooms and hospitals for sanitation.
- Laboratory crucible - is used in science labs to heat substances safely.

3.5 Wood

1. The classroom door, bookshelf, and chair are likely made from hardwood because hardwood is strong, durable and suitable for making furniture and fixtures that support weight and resist damage.
2. **Wood preparation process**

- The process is called seasoning.
- It helps remove moisture from the wood, preventing warping, cracking and rotting after use.

3. **Suitable wood for a strong table**

- Hardwood is most suitable because it is dense and durable, making it ideal for supporting heavy textbooks and lasting many years.

4. **Wood category and reason for use**

- The items are likely made from hardwood.
- Hardwood is used in workplaces because it is strong, long-lasting, and can withstand frequent use.

5. **Suitable sawing method for high-quality table tops**

- Quarter sawing is more suitable because it produces wood with better grain patterns, strength and resistance to warping-ideal for quality furniture.

6. **Preventing cracks and warping**

- The wood should have been properly seasoned before use to remove excess moisture and prevent damage.

7. **Two physical features to identify hardwood or softwood**

- Leaf type - hardwood trees usually have broad leaves, while softwoods have needle-like leaves.
- Growth rings: Hardwoods usually have narrow and clear rings, while softwoods have wider and less visible rings.

8. **Finishing techniques and importance**

- Polishing was likely used on the desk and varnishing on the chair.
- Finishing is important because it protects the wood from moisture, dirt and wear, which improves appearance.

9. **Trade and importance of wood**

- Carpentry - wood is essential for making furniture, doors and fittings used in homes, schools and offices.

10. **Improving softwood durability for outdoor use**

- The learner can apply wood preservative or weatherproof paint to protect the softwood from moisture, insects and sunlight.

3.3 Handling Waste Materials

1. Waste materials in the school compound.

(a) Four types of waste:

i. Plastic bottles
ii. Paper waste
iii. Metal wastes
iv. Concrete waste
v. Wood waste

(b) Sources in the school environment:

i. Paper waste from used books and notes
ii. Plastic bottles from drinks and snacks
iii. Metal wastes from finished classrooms and other buildings
iv. Wood wastes from construction of buldings within the school.

2. **Science clean-up activity**

- This is non-biodegradable waste.
- One way to reduce it is by encouraging learners to carry reusable containers and avoid single-use packaging.

3. **Reusing plastic containers**

(a) The method is reuse.

(b) Environmental benefit: It reduces plastic pollution and gives waste a new purpose, helping conserve resources.

4. **Composting pit activity**

(a) The method is composting.

(b) The final product is compost, which is used to improve soil fertility in the school garden.

5. **Two reasons composting is better than burning**

- It produces useful compost for farming or gardening.
- It avoids air pollution caused by smoke and harmful gases.

6. **Electronic waste example and disposal**

- Example: Old computer or phone battery
- Proper disposal: Take it to a certified e-waste recycling center or return to the supplier for safe handling.

7. **Matching waste handling methods**

- Reduce – (iv) Avoiding excessive packaging
- Reuse – (iii) Using old containers creatively
- Recycle – (ii) Sorting waste into new products
- Compost – (i) Making compost from food scraps

8. **Class project reflection**

- Challenge: Some group members were shy to speak.
- Lesson: We learned how teamwork and preparation help us explain ideas clearly.

9. **Why burning should be the last method**

- It causes air pollution and can harm human health and the environment.

10. **One action learner can take to encourage proper waste management**

- They can create labelled bins for separating waste and teach others how to use them correctly.

4.0 TOOLS AND PRODUCTION

4.1 Measuring and Marking out tools

1. **Tool primarily used to check if a surface is perfectly flat or upright?**

C) Spirit Level

2. **Main reason for marking out lines before cutting**

B) To guide where to cut accurately

3. **NOT a good practice for caring for a steel rule**

C) Using it to pry open a paint can

4. **Likely problem if a try square is dropped**

B) The 90-degree angle might be damaged, making it inaccurate.

5. **Why tools should be stored in a dry environment**

B) To prevent them from rusting or corroding

6. A **Try Square** is used to check and mark out accurate 90-degree angles.

7. **Two reasons to clean measuring and marking tools after use.**

- To prevent rust or damage
- To keep them accurate and ready for the next use.

8. **Two ways to protect the sharp tip of a scriber**

- Store it in a protective case or pouch
- Cover the tip with a rubber cap or cork

9. **Importance of using measuring and marking tools with technical drawings**

- They help ensure that the work is accurate and matches the exact size and shape shown in the plan.

10. Cutting a piece of wood exactly 30 cm

(a) Two tools:

- Steel rule
- Pencil or marking knife

(b) Steps to measure and mark out:

i. Place the steel rule along the edge of the wood.

ii. Measure 30 cm from one end and mark the point with a pencil.

iii. Use a try square to draw a straight line across the wood at the 30 cm mark.

4.2 Cutting tools

1. **Tools displayed by Grade 8 learners**

- Snips - used to cut thin sheets of metal.
- Hacksaw - used to cut metal rods, pipes, or plastic.
- Plane – used to shave and smooth wood surfaces.
- Chisel – used to cut or shape wood.

2. **Why a knife was better choice than scissors for opening a heavy carton.**

- A knife has a stronger, sharper blade that can easily pierce and cut through thick cardboard, while scissors may bend or break.

3. **Importance of choosing a tool based on material.**

- Different tools are designed for specific materials. Using the correct tool ensures accurate cutting, preventing damage to the tool and makes work safer.

4. **The most appropriate tool is a pair of scissors or a utility knife.**

- Reason: Both tools cut thin plastic smoothly and accurately. Scissors are common and safe for flexible plastics like sheets or wrappers, while a utility knife is better for straight cuts on harder plastic without cracking.

5. **Four steps to use a plane correctly and safely**

i. Secure the piece of wood firmly on the workbench.

ii. Hold the plane with both hands, one on the handle and one on the knob.

iii. Push the plane forward smoothly along the grain of the wood.

iv. Keep fingers away from the blade and store the plane safely after use.

6. **Three ways to prevent rusting of metal cutting tools**

i. Apply a thin coat of oil after cleaning.

ii. Store tools in a dry place.

iii. Wipe tools clean after use to remove moisture or dirt.

7. **Two reasons for sharpening cutting tools regularly**

- Sharp tools cut more accurately and neatly.
- Sharp tools reduce effort and prevent accidents caused by slipping.

8. **Four practices to care for cutting tools after use**

i. Clean tools thoroughly after use.

ii. Store them properly in toolboxes or racks.

iii. Apply oil to prevent rust.

iv. Cover sharp edges with protective caps.

9. **Three occupations that require cutting tools**

i. Carpentry: depends on saws and chisels to shape wood into furniture.

ii. Tailoring: uses scissors and cutters to cut fabric for clothing.

iii. Construction: uses saws and knives to cut building materials like wood and metal.

10. **Safety hazard and solution.**

- Hazard: The uncovered chisel blade can injure someone accidentally.
- Solution: Always cover the blade with a protective cap or store it in a tool bag designed for sharp tools.

4.3 Holding Tools

1. **G-clamp on timber**

(a) The holding tool is a G-clamp.

(b) The task being performed is holding timber firmly on a workbench for cutting or joining.

(c) The tool is used instead of hands because it provides stronger grip and prevents accidents.

2. **Cutting wire**

(a) The most suitable holding tool is pliers.

(b) Safety measure: Keep fingers away from the cutting edges and wear safety goggles.

(c) Cutting wire with bare hands is dangerous because it can cause cuts or injuries.

3. **Spanner on bolts**

(a) If the spanner is too loose, it can slip and damage the bolt or injure the user.

(b) Safety precaution: Always use the correct size spanner for the bolt.

4. **Blacksmith with tongs**

(a) The holding tool is tongs.

(b) It is important because it allows safe handling of hot metal during forging.

(c) Protective gear: Heat-resistant gloves (or leather apron).

5. **Four holding tools and uses**

(a) Hammer with claw – holding and pulling out nails.

(b) Pliers – holding and bending wires.

(c) G-clamp – holding timber or metal firmly on a bench.

(d) Tongs – holding hot metal in a forge.

6. **Organizing worksheets**

(a) The tool is a paper clip (or stapler).

(b) Advantage: Keeps papers neat and together.

- Disadvantage: Without it, papers scatter and get lost easily.

7. **Workshop tools and tasks**

- Pliers - cutting or bending wire.
- G-clamp - holding timber or metal on a bench.
- Spanner - tightening or loosening bolts.

8. **Caring for metal holding tools**

- Clean after use to remove dirt and rust.
- Store in a dry place to prevent corrosion.
- Oiling moving parts regularly to keep them smooth.

9. **Why holding tools improve safety**

- They prevent injuries by keeping hands away from sharp or hot materials.
- They hold workpieces firmly, reducing slips and accidents.
- They make tasks easier and reduce physical strain.

10. **Table completion**

- For holding papers together - the suitable tool is a paper clip or stapler.
- For bending a wire - the suitable tool is pliers.
- For holding timber for cutting - the suitable tool is a G-clamp.
- For holding hot metal for forging - the suitable tool is tongs.

4.4 Driving Tools

1.(a) The holding tool being used is a G-clamp.

(b) The task being performed is tightening/ holding timber firmly on a workbench.

(c) Two safety precautions the learner should take:

- Ensure the G-clamp is tightened securely but not over-tightened (to avoid damaging timber or tool).
- Keep fingers clear of the screw mechanism while tightening to prevent pinching injuries.

2. **Matching driving tools to tasks**

i) Claw hammer ⟶ e) Driving nails into timber

ii) Leather punch ⟶ a) Punching holes in a belt

iii) Screwdriver ⟶ b) Driving a screw into wood

iv) Spanner ⟶ c) Tightening a bolt

v) Wooden mallet ⟶ d) Light tapping in woodwork

3. **Drawings and uses**

(a) Learners should draw and label two driving tools (e.g., screwdriver and claw hammer).

(b) Uses:

- Screwdriver ⟶ driving screws into wood or metal.
- Claw hammer ⟶ driving or removing nails from timber.

4. **Danger of wrong screwdriver size**

- Using a screwdriver that does not fit the screw head properly can cause it to slip, damage the screw or injure the user's hand.

5. **Amina's accident**

(a) Mistake: She may have failed to grip the hammer firmly or misaligned it with the nail.

(b) Safety measures:

- Always hold the hammer securely and focus on the nail.
- Wear protective gloves to reduce injury risk.

6. **Tightening bolts on a gate**

(a) The most appropriate tool is a spanner.

(b) Danger of wrong size: It can slip, damage the bolt head or cause injury.

7. **Punching holes in leather**

(a) The tool used is a leather punch.

(b) Tip: Align the punch directly over the marked spot before striking.

8. **Safety when using driving tools**

- Wear protective gear such as gloves or goggles.
- Use the correct tool for the correct task.
- Keep tools clean, well-maintained and handle them carefully.

9. **Comparing mallet and hammer**

(a) Material:

- Mallet ⟶ usually made of wood or rubber.
- Hammer ⟶ usually made of metal with a wooden or plastic handle.

(b) Task:

- Mallet ⟶ best for light tapping in woodwork without damaging surfaces.
- Hammer ⟶ best for driving or removing nails and heavy striking tasks.

10. **Driving a screw into a wooden frame**

(a) The tool used is a screwdriver.

(b) Correct use: Hold the screwdriver firmly by the handle, align it with the screw head and turn steadily while applying downward pressure.

(c) Challenge: The group may have faced difficulty if the screw was hard, the wood was tough or the screwdriver slipped.

4.5 Computer Hardware

1. **Example of computer hardware**

- C) Monitor

2. **Primary function of a keyboard**

- C) To input text and commands

3. **Hardware component for saving documents permanently**

- C) Hard Drive

4. **Three input devices and their functions**

- Keyboard – used to input text and commands.

- Mouse - used to point, select and click items on the screen.
- Scanner - used to convert paper documents into digital form.

5. **Three output devices and their functions**

- Monitor - displays images, text and videos.
- Printer - produces hard copies of documents.
- Speakers - output sound from the computer.

6. Difference between RAM and Hard Drive

- RAM (Random Access Memory) stores data temporarily while the computer is running.
- Hard Drive stores data permanently, even when the computer is turned off.

7. Why CPU is the "brain" of the computer

- Because it controls all operations, processes, instructions and manages communication between hardware and software.

8. Importance of computer hardware in a user environment

- It enables interaction between the user and the computer system.
- It supports storage, processing and communication of information.

9. Problem faced without a monitor

- You would not be able to see or interact with the computer's output, making it impossible to use effectively.

10. Essential hardware for typing a story

- Keyboard - to input the text.
- Monitor - to view and edit the story as you type.

4.6 Computer Software

1. **Software running in the background**

- The software was an Operating System (OS).
- Its role is to manage computer resources and provide the interface for users to interact with files and applications.

2. **Mary's application software**

(a) Word Processor (MS Word) ⟶ Used for writing and editing text documents like compositions.

(b) Spreadsheet (MS Excel) ⟶ Used for creating budgets, calculations and organizing data in tables.

3. **Librarian's software**

- Software: Database Management System (DBMS)
- Category: Application software

4. **Importance of updating utility programs**

- It is important because updates improve protection against new threats, fix errors and enhance performance.

5. **Correct matching of activities to software**

- Creating a slide show on climate change ⟶ MS PowerPoint
- Budgeting for a fundraiser ⟶ MS Excel
- Typing a report ⟶ MS Word

6. **Importance of spreadsheet software for a business manager**

- It helps to organize and calculate sales and expenses accurately.
- It allows easy analysis of data through charts and graphs.

7. **Why presentation software was best for the meeting**

- Because it displays information clearly with visuals, making the yearly performance easy to understand.

8. **How MS Word supports office duties**

- It helps in typing and formatting official documents like letters and reports.
- It allows editing, saving, and printing documents for daily office use.

9. **Four main steps in creating a new PowerPoint presentation**

i. Open MS PowerPoint.

ii. Choose a blank presentation or template.

iii. Insert slides and add text, images or charts.

iv. Save the presentation and rehearse the slide show.

10. **Three engaging features in presentation software**

(a) Animations – to make text or objects move.

(b) Slide transitions – to change slides smoothly and attractively.

(c) Multimedia (images, audio, video) – to make slides more interesting and interactive.

4.7 Project

1. **Negative effects of poor waste disposal**

- Causes pollution of soil, water and air.
- Leads to spread of diseases due to breeding of pests.
- Creates unpleasant environment and lowers community health standards.

2. **Steps to gather accurate information from residents**

- Prepare clear questions before conducting interviews.
- Engage a variety of respondents to get balanced views.
- Record responses carefully for later analysis and accuracy.

3. **Classification of waste**

a) Organic waste: papers, vegetables.
Non-organic waste: electronics, glasses, plastics.

b) Disposal methods:

- Organic ⟶ composting or recycling into manure.
- Non-organic ⟶ recycling, reusing, or safe collection for disposal.

4. **Reasons poor waste disposal is suitable for a project**

- It is a real problem affecting the community's health and environment.
- Learners can apply practical skills to design solutions.
- The project promotes awareness and responsibility among learners and residents.

5. **Locally available materials for waste disposal item**

- Old tyres - strong and durable.
- Wooden planks - easy to cut and join.
- Metal sheets - long lasting and resistant to damage.
- Plastic containers – lightweight and easy to clean.

6. **Key features in a good sketch of a waste bin**

- Clear dimensions and measurements.
- Labels showing parts (lid, body, base).
- Indication of materials to be used.

7. **Tools in construction image**

(a) Tools and functions:

- Tape measure – used to measure length and dimensions.
- Handsaw – used to cut wood into required sizes.

(b) Safety precautions:

- Tape measure ⟶ avoid snapping back suddenly to prevent injury.
- Handsaw ⟶ cut away from the body and wear protective gloves.

8. **Testing and evaluating the waste bin**

- Check if it holds waste without leaking or breaking.
- Ensure it is stable and does not topple easily.
- Observe if it is easy to use and accessible to the community.

9. **Fundraising methods: benefits and challenges**

a) Collecting scrap materials:

- Benefit ⟶ reduces costs and promotes recycling.
- Challenge ⟶ may not provide enough usable materials.

b) Organizing a mini-fundraiser:

- Benefit ⟶ raises money directly from community support.
- Challenge ⟶ requires planning and may not raise sufficient funds.

Seeking parental donations:

- Benefit ⟶ quick and reliable source of funds.
- Challenge ⟶ depends on willingness and ability of parents to contribute.

10. **Project cost calculation**

(a) Total cost = Materials (600) + Labour (300) = Ksh 900

- Profit margin = 10% of 900 = Ksh 90
- Total selling price = 900 + 90 = Ksh 990

(b) Importance of profit margin:

- Ensures sustainability and growth of future projects.
- Provides compensation for effort and resources used.

5.0 ENTREPRENEURSHIP

5.1 Introduction to Entrepreneurship

1. Definitions

(a) Entrepreneur - a person who starts and manages a business by taking risks to make profit.

(b) Entrepreneurship – the process of identifying opportunities, starting businesses and managing them for growth.

(c) Enterprise – a business or project started to provide goods or services.

2. Difference between an entrepreneur and a business person

- An entrepreneur creates new ideas, takes risks and innovates to solve problems.
- A business person mainly runs an existing business to make profit without necessarily innovating.

3. Reasons why it is good to become an entrepreneur

- Provides self-employment and independence.
- Creates income and wealth.
- Allows one to use talents and creativity to solve problems.

4. Entrepreneurship and job creation

- Entrepreneurs start businesses that employ workers directly and also create opportunities for suppliers and service providers.

5. How entrepreneurship helps the government

- It increases tax revenue through business profits and employee salaries.

6. Qualities of a successful entrepreneur

- Creative and innovative.
- Hardworking and determined.
- Risk-taking.
- Good decision-making skills.

7. **Sources of business ideas**
- Observing community needs and problems.
- Personal skills and talents.
- Market research and trends.

8. **Contribution to economic growth**
- Entrepreneurs increase production of goods and services.
- They create wealth and improve living standards in the community.

9. **Importance of developing employees' skills**
- Improves productivity and efficiency.
- Builds loyalty and motivation among workers, leading to business success.

10. **Example of social responsibility**
- An entrepreneur can support community projects such as building schools, health centers, or sponsoring local events.

5.2 Production Unit

1. **Which of the following is not a factor of production?**
- D. Profit

2. **The process of converting raw materials into finished goods is called:**
- C. Production

3. **Tools, machinery and buildings used in production are examples of:**
- C. Capital

4. **Which of these is a primary industry?**
- B. Fishing

5. **The person who combines land, labour, and capital to produce goods or services is called an:**
- C. Entrepreneur

6. **Three factors of production**
- Land - Labour
- Capital

7. **Two examples of raw materials**
- Cotton
- Timber

8. **Difference between goods and services**
- Goods are tangible items that can be touched, stored and owned (e.g. clothes and furniture).
- Services are intangible activities provided to satisfy needs (e.g. teaching and banking).

9. **Main goal of production**
- The main goal is to satisfy human needs by providing goods and services.

10. **Two safety precautions in a workshop**
- Wear protective gear such as gloves or goggles.
- Keep the work area clean and organized to avoid accidents.

5.3 Financial Goals

1. **Best definition of a financial goal**

   c) A specific target or objective for managing or using your money

2. **Saving Ksh 500 for a storybook by next month**

   c) Short-term goal

3. **Kamau saving for university education in 10 years**

   c) Long-term goal

4. **NOT a characteristic of a SMART financial goal**

   c) Random

5. **Factor related to knowing how much money you receive regularly**

   c) Current income/Source of money

6. **Practice of making wise choices about money**

   b) Financial discipline

7. **Putting aside money before spending on other things**

b) Paying yourself first

8. **Three factors to consider when setting a financial goal**

- Timeframe – how long it will take to achieve the goal.
- Cost of the goal – the amount of money required.
- Source of income – where the money will come from.

9. **Two practical ways a Grade 7 student can observe financial discipline**

- Save part of their pocket money regularly.
- Avoid unnecessary spending and plan purchases carefully.

10. **Importance of avoiding impulse buying**

- Because it leads to wasting of money on unplanned items, reduces savings, and prevents achieving financial goals.

5.4 Bookkeeping

1. Recording money received and spent

- This practice is called bookkeeping.
- It is important because it helps keep track of income and expenses which prevents losses and supports better financial planning.

2. **Matching business terms**

i) Assets ⟶ What the business owns (e.g. cash, buildings, stock).

ii) Liabilities ⟶ What the business owes (e.g. loans, debts).

iii) Capital ⟶ Owner's contribution to the business.

iv) Income ⟶ Money earned from sales or services.

3. **Document for recording transactions**

- The document is a cash book (or business record book).

4. Equation Mary can use

- The bookkeeping equation:
- It shows what the business owns, owes, and the owner's contribution.

5. **Brian's assets calculation**

- Capital = KES 80,000
- Loan = KES 20,000
- Assets = Capital + Liabilities = KES 100,000

6. **Matching activities to the transaction types**

- Paying rent on the shop ⟶ Revenue Transaction
- Buying sugar in cash ⟶ Cash Transaction
- Owner brings in Ksh. 10,000 ⟶ Capital transaction
- Selling items to a customer on credit ⟶ Credit transaction

7. **Difference between cash and credit transactions**

- Cash transaction: Payment is made immediately at the time of sale.
- Credit transaction: Payment is delayed; the customer pays later.

8. **Statement showing income, expenses and profit**

- The statement is called an Income Statement (or Profit and Loss Account).
- Its three main parts are:

(a) Income (Revenue)

(b) Expenses

(c) Profit or Loss

9. **Profit calculation for school business club**

- Income = Ksh. 15,000
- Expenses = 4,000 + 5,000 + 1,000 = Ksh. 10,000
- Profit = 15,000 – 10,000 = Ksh.5,000

10. Kevin's bag profit calculation

- Costs = 1,000 + 100 + 400 + 100 = Ksh. 1,600
- Selling price = KES 2,000
- Profit = 2,000 – 1,600 = Ksh. 400

11. **Net cash flow for school project**

- Cash inflows = 10,000 + 5,000 = Ksh. 15,000
- Cash outflows = 3,000 + 7,000 = Ksh. 10,000
- Net cash flow = 15,000 – 10,000 = Ksh. 5,000

12. **Cash flow activities**

- Operating activity ⟶ Selling goods or services
- Investing activity ⟶ Buying equipment or assets
- Financing activity ⟶ Receiving a loan or owner's capital

13. **Importance of financial records in daily life**

- They help families plan and budget effectively.
- They show how money is spent and earned, preventing misuse.
- They support saving and achieving financial goals.

5.5 Income and Budgeting

1. **Type of income Kevin's uncle receives**

- salary/wages - regular payments from an employer.

2. **Income received by the artist**

- The artist received royalties, because she was paid for the use of her creative work.

3. **Matching activities with sources of income**

- A retired teacher receives monthly payments ⟶ Pension
- A child earns Ksh. 50 per bracelet sold ⟶ Profits
- A musician gets paid when songs are downloaded ⟶ Royalties

4. **Faith's profit per packet**

- Selling price = Ksh. 50
- Buying price = Ksh. 30
- Profit = 50 – 30 = Ksh. 20
- Type of income: Profit

5. **Practices showing wise spending**

- Comparing prices before buying
- Keeping track of spending

6. **John's remaining money**

- Total income = Ksh. 500
- Expenses = 100 + 150 + 100 + 100 = Ksh. 450
- Remaining = 500 – 450 = Ksh. 50

7. **Needs vs wants**

- Snacks ⟶ Want
- Pens ⟶ Need
- School shoes ⟶ Need

8. **Jane's budgeting mistake**

- She allocated Ksh. 900 (700 + 200) while her income was only Ksh. 800.
- Fix: She should reduce expenses or savings to match her actual income.

9. **Importance of including savings in a budget**

- Helps to prepare for emergencies or future needs.
- Allows one to achieve financial goals like education or projects.

10. **Ethical behaviour in budgeting**

- Being honest about income and expenses.
- Avoiding misuse of money meant for important needs.
- Keeping accurate records of transactions.

11. **Poor budgeting habit shown by Peter**

- This shows impulse buying and lack of planning, leading to borrowing unnecessarily.

12. **Importance of financial planning**

- Ensures income is used wisely to meet needs and goals.
- Prevents overspending and helps achieve financial stability.

5.6 Marketing of Goods and Services

(a) **Activity described by learners**

- This activity is called advertising/ marketing.
- It is important because it attracts customers, increases sales and makes the business well known.

2. **Peter's marketing tool**

- He used a flier.
- Benefit: It reaches many people quickly and provides clear information about the product.

3. **Method of gathering market information**

- They used a questionnaire/survey.

4. **Marketing methods in Mercy's shop**

- Discount stickers and free samples encourage customers to buy more.
- Loud music and promotions attract attention and increase customer traffic.

5. **Reasons to observe what customers buy most often**

- Helps the business stock popular items to meet demand.
- Guides the owner to improve products and avoid losses from unsold goods.

6. **Importance of good roads and vehicles in selecting a market**

- Good roads make transport of goods easier and faster.
- Strong vehicles ensure safe delivery of products without damage.

7. **Choosing a better location for selling school bags**

- Select a place with high customer traffic (near schools or busy streets).
- Choose a location where customers have the ability to pay for the product.

8. **Source of market information for John**

- He used customer preferences/ observation of buying habits.

9. **Characteristics of a suitable market for selling milk**

- High demand for milk products.
- Accessibility with good transport and storage facilities.
- Customers with ability to pay regularly.

10. **Why expensive shoes in a low-income area is unsuitable**

- Because most customers cannot afford them, leading to low sales and business failure.

11. **Importance of customer feedback**

- It helps improve product quality to meet customer needs.
- It allows the business to identify weaknesses and make necessary changes.

5.7 Distribution of Goods and Services

1. **People who help producers sell their goods**

- These are intermediaries (middlemen such as wholesalers, retailers, agents and brokers).

- Role in business: They connect producers to consumers, facilitate product movement, provide market information, and ensure goods reach the right place, time and quantity.

2. **Matching intermediaries to functions**

- A wholesaler buys goods in bulk from producers and sells them to retailers.
- A retailer sells goods in small quantities directly to the final users.
- An agent or broker links the buyer and seller and earns a commission for their service.

3. **Product movement chain**

- Producer ⟶ Wholesaler ⟶ Retailer ⟶ Consumer

4. **Two reasons why retailers are important**

- They provide goods in small, affordable quantities to final consumers.
- They offer convenience and accessibility, bringing goods closer to where consumers live.

5. **Farmer selling mangoes directly at the gate**

- This is a direct distribution channel (Producer ⟶ Consumer).
- Suitable for fresh fruits because it reduces delays, ensures freshness and avoids spoilage by cutting out intermediaries.

6. **Mary's shop distribution channel**

- Producer ⟶ Wholesaler ⟶ Retailer (Mary's shop) ⟶ Consumer

8. **Two reasons why ethics are important in distribution**

- Ensures fairness and honesty, preventing exploitation of consumers or producers.
- Builds trust and reputation, which sustains long-term business relationships.

9. **Situation where distribution prevented waste**

- Example: Milk collected from farmers and quickly distributed to processors and retailers prevented spoilage.
- Proper distribution channels ensures perishable goods reach consumers before they expire.

10. **Distribution during drought relief**

- Distribution is necessary to deliver food to affected areas efficiently.
- It ensures equitable access, prevents hoarding and saves lives by reaching those in urgent need.

5.8 Financial Services

1. a) The two financial institutions are:

- SACCO
- M-Pesa (Mobile money service)

b) Services provided:

- SACCO: Provides savings and loans to members.
- M-Pesa: Provides money transfer and payment services.

c) SACCO stands for: Savings and Credit Cooperative Organization

2. **Financial institution**

a) The possible type of financial institution is a commercial bank.

b) Services offered to business owners:

- Provides loans for business expansion.
- Offers savings accounts for secure storage of money.

3. **Matching**

(i) Insurance company ⟶ C. Offers protection against loss

(ii) Commercial bank ⟶ D. Offers savings accounts and loans

(iii) Microfinance institution ⟶ B. Provides loans and business advice

(iv) Mobile money platform ⟶ A. Receives and stores money on phones

4. **Micro finance and mobile money services**

a) Services provided:

- Microfinance institution: Loan services
- Mobile money: Payment transfer services

b) Support to business growth:

- Loans provide capital for expansion or stock purchase.
- Mobile money enables quick, safe payments to suppliers, improving efficiency.

5. **Importance of financial services**

a) **Loan services:** Important because they provide capital for starting or expanding a business.

b) **Savings services**: Important because they allow secure storage of profits for future use.

c) **Insurance services:** Important because they protect businesses against unexpected losses.

6. **Logo**

a) The logo represents a mobile money service (M-Pesa).

b) Services useful to small-scale traders:

- Receiving customer payments instantly.
- Sending money to suppliers safely.

7. **Financial institutions**

a) Three financial institutions John can use:

- Commercial bank
- Microfinance institution
- Insurance company

b) Matching institutions to needs:

- Commercial bank ⟶ Save profits
- Microfinance institution ⟶ Access loans
- Insurance company ⟶ Protects goods from loss

8. **Services offered by financial institutions**

- Four services financial institutions offer to support business development:

a) Loan provision

b) Savings facilities

c) Insurance protection

d) Money transfer services

9. **Filling table**

- An example of a commercial bank is Equity Bank.

a) Microfinance institution is - Faulu Kenya.

b) Mobile money service is - M-Pesa.

c) Insurance company is - Jubilee Insurance.

10.a) **The three financial institutions Amina is using are:**

- SACCO
- Mobile money service (M-Pesa)
- Insurance company

b) **Benefits to her business:**

- SACCO: Helps her save profits and access affordable loans.
- M-Pesa: Enables easy receipt of customer payments.
- Insurance company: Provides protection against risks and losses.

5.9 Government and Business

1. **Government involvement in Business**

It is important for the government to get involved in business because:

- Regulation and fairness: The government ensures businesses follow rules that protect consumers and workers.
- Revenue collection: Through taxes, the government raises money to fund public services.
- Support to national development: These actions promote stability, protect citizens, and provide funds for infrastructure,

education and healthcare, which grow the economy.

2. **Business Regulations and Compliance**

a) The business failed to comply with:

- Health inspection regulations
- Business licensing regulations

b) Such regulations exist to protect public health and ensure businesses operate legally and safely.

3. **Three ways financial services help small businesses grow:**

- Provide loans for expansion and purchasing stock.
- Offer savings facilities to secure profits.
- Enables payment and transfer of services that improve efficiency.

4. **Types of Taxes in Business**

- Charged on goods entering the country ⟶ Import duty
- Applied when purchasing goods and services ⟶ Value Added Tax (VAT)
- Paid once by business owners to operate ⟶ License fee

5.a) Two pieces of information on a KRA e-TIMs receipt that prove tax compliance:

- KRA PIN number
- Tax amount or VAT charged

b) Businesses should issue such receipts to prove they are paying taxes and to build customer trust.

6. **Online Government Platforms for Business**

Examples of online government platforms:

- eCitizen: Allows businesses to register online; benefit ⟶ saves time and reduces paperwork.
- iTax (KRA): Used for filing and paying taxes; benefit ⟶ ensures compliance and easy record-keeping.

7. **Government Agencies and Their Functions**

i) NTSA ⟶ Issues licenses for vehicle dealers

ii) KRA ⟶ Manages national taxation

iii) BRS ⟶ Registers new companies

8. **Licenses and Permits for Starting a Business**

a. Two licenses/permits needed:

- Business permit from the county government
- Health and safety certificate

b. Consequence of failing to obtain these: The business may be closed down or fined.

9. **Benefits of Complying with Government Regulations**

Three benefits of complying with government regulations:

- Legal protection from closure or penalties.
- Customer confidence in the business.
- Access to government support such as loans or tenders.

10. **Business Registration Certificate**

a. A Business Registration Certificate proves that the business is officially recognized and legally registered.

b. Registration is important because it gives the business legal identity, protects it from illegal competition and allows access to government services.

5.9.1 Business Plan

1. **Creating a business plan helps because:**

- It provides clear direction on how the business will operate.
- It helps in organizing resources and estimating costs before starting.

- It reduces risks by planning ahead and identifying challenges.

2. **Three sections that explain what the business is about and how it will operate are:**

- Business Description
- Products and Services
- Marketing Plan

3. **Two ways the marketing plan could be filled in:**

- Advertising through posters around the school.
- Offering discounts to attract classmates and teachers.

4. **Two types of financial information to include:**

- Expected income (sales revenue)
- Estimated expenses (costs of materials rent, etc.)

5. **Fruit Juice Business Example**

a) Products and services ⟶ Fresh fruit juice in different flavours

b) Target customers ⟶ Students and teachers at school

c) Business goal for expansion ⟶ Open more selling points or add new juice varieties

6. **Role of Market/Competitor Analysis**

- Showing who the competitors are and what they offer.
- Helping to identify strengths, weaknesses and opportunities in the market.
- Guiding the learner to set competitive prices and improve products.

7. **How a Business plan helped increase Profit**

Two reasons:

- It provided clear financial planning, avoiding unnecessary spending.
- It guided better marketing and customer targeting hence leading to more sales.

8. **Missing component in sample plan**

- Business Description ⟶ **Marketing Plan** (since details mention posters and discounts).
- Financial Projection ⟶ **Expected sales and costs of running the business.**

9. **Importance of a Business Plan to an Entrepreneur**

Four reasons:

- Guides business operations step by step.
- Helps secure funding or loans.
- Identifies risks and solutions.
- Sets clear goals for growth and success.

10. Snacks Stall Business Plan Example

a) Executive Summary - A small snacks stall at home to serve neighbours.

b) Business Description - Selling affordable snacks like mandazi and samosas.

c) Market/Competitor Analysis - Other stalls nearby sell snacks; aim to offer better quality and prices.

d) Products and Services - Freshly prepared snacks and soft drinks.

e) Marketing Plan - Use word of mouth and posters to attract customers.

f) Financial Projections – Estimate daily sales, costs of ingredients and expected profit.

MODEL TEST PAPERS

GRADE 7

MODEL SAMPLE PAPER 1

SECTION A:

MULTIPLE CHOICE (30 MARKS)

1. B
2. B
3. A
4. C
5. A
6. B
7. B
8. B
9. B
10. B
11. B
12. C
13. B
14. A
15. B
16. B
17. B
18. B
19. B
20. B
21. A
22. C
23. A
24. D
25. Micro computer ⟶ Mini computer ⟶ Mainframe computer ⟶ Super computer
26. C
27. A
28. C
29. D
30. B

SECTION B:

STRUCTURED QUESTIONS (50 MKS)

31. **Safety rules in a school workshop** (3 mks)

- Wear protective gear (goggles, aprons, gloves).
- Do not run or play with tools.
- Keep tools and materials properly arranged.

32. **Tools for measuring and marking** (3 mks)

- Ruler
- Vernier caliper
- Scriber

33. **Bird feeder project** (4 mks)

a) Tools needed (2 marks):

- Hammer
- Saw

b) Safety precautions (2 marks):

- Handle tools carefully to avoid injury.
- Wear protective gear such as gloves.

34. **Importance of accurate measurement** (3mks)

- Ensures items fit correctly.
- Prevents wastage of materials.
- Produces neat and professional work.

35. Designing a name tag (4 marks)

a) Steps (2 marks):

- Measure and cut cardboard to size.
- Write or decorate the name clearly.

b) Tools (2 marks):

- Ruler
- Scissors

36. **Working with a file** (4 marks)

a) Material: Metal (1 mark)

b) Other tools (2 marks):

- Hammer
- Drill

c) Importance of gloves (1 mark):

- Protects hands from sharp edges and injury.

37. **Differences between metallic and non-metallic materials** (3 marks)

- Metallic materials conduct heat and electricity; non-metallic do not.
- Metals are strong and durable; non-metals are weaker.
- Metals are shiny; non-metals are dull.

38. **Caring for tools after use** (3 marks)

- Clean tools after use.
- Store them properly in toolboxes.
- Oil or grease metallic tools to prevent rust.

39. **Ways learners can earn money using Pre-Tech skills** (3 marks)

- Making and selling crafts.
- Repairing simple items.
- Offering cleaning or maintenance services.

40. **Greeting card business** (4 marks)

a) Materials (2 marks):

- Cardboard / paper
- Coloured pens or markers

b) Advertising methods (2 marks):

- Posters
- Social media platforms

41. **Importance of saving money** (3 marks)

- Provides capital for future expansion.
- Helps during emergencies.
- Encourages financial discipline.

42. **Examples of computer hardware** (3 marks)

- Monitor
- Keyboard
- CPU

43. **Typing a school report** (4 marks)

a) Input devices (2 marks):

- Keyboard
- Mouse

b) Software programs (2 marks):

- Microsoft Word
- Google Docs

44. **Internet safety** (3 marks)

- Do not share personal information online.
- Use strong passwords.
- Avoid suspicious websites or links.

GRADE 7

MODEL SAMPLE PAPER 2

SECTION A:

MULTIPLE CHOICE (30 MARKS)

1. B
2. D
3. C
4. B
5. B
6. B
7. B
8. B
9. D
10. B
11. A
12. A
13. C
14. A
15. A
16. A
17. B
18. A
19. A
20. A
21. A
22. A
23. B

24. C
25. B
26. C
27. C
28. C
29. B
30. C

SECTION B:

STRUCTURED QUESTIONS (50 MKS)

31. **Computer parts and communication tools**

a) Input devices: Keyboard, Mouse (2 marks)
Output devices: Monitor, Printer (2 marks)

b) Benefits of digital tools:

- Fast sharing of information (2 marks)
- Reach wider audiences easily (2 marks)
- Enhance collaboration and teamwork (2 marks)

32. **Physical properties of non-metallic materials like rubber** (3 marks)

- Flexible/elastic
- Poor conductor of heat and electricity
- Lightweight

33. **Metals definitions**

a) Alloy: A mixture of two or more metals or a metal with another element. (2 mks)

b) Ferrous: Metals that contain iron. (2 mks)

c) Magnetism: The property of a material to attract or repel using magnetic force. (2 marks)

d) Application of non-ferrous metals: Aluminium used in cooking utensils. (1mk)

34. **Instrument question**

a) Tool: Vernier Caliper (2 marks)

b) two parts (2marks)

- Legs/Jaws - the projecting arms that hold and measure the object (inside jaws for internal dimensions, outside jaws for external dimensions).
- Scale/Beam - the main body with a graduated scale or sliding vernier used to read measurements. (2 marks)

c) Use of Venier Caliper

- used to measure external, internal, and depth dimensions accurately.

35. **Free-hand sketching**

a) Techniques (4 marks):

- Hatching
- Cross-hatching
- Stippling
- Blending

b) Check for a simple 2D shape (circle or square) neat and well labelled. (4 marks)

c) Importance (2 marks):

- Helps in quick communication of ideas
- Useful for initial design concepts

36. **Entrepreneurship**

a) Importance in community (3 marks):

- Creates employment
- Provides goods and services
- Promotes innovation and development

b) Qualities of an entrepreneur (4 marks):

- Creative
- Risk-taker
- Hardworking
- Good decision-maker

c) Sources of business ideas (3 marks):

- Personal hobbies
- Market needs
- Observation of successful businesses

37. **Production unit**

a) Meaning: A place where goods and services are produced. (1 mark)

b) Factors determining size (3 marks):

- Availability of capital
- Size of market demand
- Availability of raw materials

GRADE 7

MODEL SAMPLE PAPER 3

SECTION A:

MULTIPLE CHOICE (30 MARKS)

1. A
2. D
3. A
4. D
5. A
6. D
7. B
8. C
9. B
10. D
11. B
12. C
13. B
14. B
15. C
16. D
17. B
18. B
19. D
20. A
21. D
22. B
23. D
24. B
25. B
26. C
27. C
28. B
29. C
30. B

SECTION B:

STRUCTURED QUESTIONS (50 MKS)

31. **Studying Pre-Technical Studies**

a) Reasons (3 marks):

- Provides practical skills.
- Prepares learners for careers.
- Encourages problem-solving and creativity.

b) Components (3 marks):

- Business Studies
- Computer Studies
- Technical Studies

c) Skills acquired (3 marks):

- Technical drawing
- Entrepreneurship
- ICT skills

d) Career pathway (1 mark):

- A route learners follow to achieve a career goal.

e) Careers (2 marks):

- Technician
- Entrepreneur

32. **Safety rules and hazards**

a) General safety rules (2 marks):

- Wear protective gear.
- Keep tools properly stored.

b) Hazards in computer lab (2 marks):

- Electrical shocks.
- Fire hazards.

c) First Aid kit items (2 marks):

- Bandages
- Antiseptic

33. **Computing terms**

i) Data ⟶ Raw facts (1 mark)

ii) Information ⟶ Processed data (1mark)

iii) Computer ⟶ Electronic device for processing data (1 mark)

iv) Hardware ⟶ Physical parts of computer (1 mark)

v) Software ⟶ Programs that run on computer (1 mark)

b) Input vs Output (4 marks):

- Input device: Keyboard (example)
- Output device: Monitor (example)

c) Main component (1 mark):

- CPU

d) System vs Application software (3 marks):

- System software manages hardware (e.g. Operating System).
- Application software performs tasks (e.g.Word).

e) Permanent storage devices (2 marks):

- Hard Disk Drive
- SSD

34. **Technical drawing**

a) Definition (1 mark):

Drawing using instruments to show precise details.

b) Difference (2 marks):

Artist's drawing is expressive; technical drawing is exact and standardized.

c) Free-hand sketching (3 marks):

Drawing without instruments; valuable for quick idea communication.

d) Check for a neat freehand sketch of a hammer or pliers, correctly labelled. (4 marks)

35. **ICT tools**

a) Examples (3 marks):

- Email
- Presentation software
- Collaboration platforms

b) Synchronous vs Asynchronous (3 marks):

- Synchronous: Real-time (e.g. video call).
- Asynchronous: Delayed (e.g. email).

36. **Materials**

a) Definition (1 mark):

Substances used to make products.

b) Properties (2 marks):

- Physical: Colour, density
- Mechanical: Strength, hardness

c) Classification (2 marks):

Metallic and non-metallic

37. **Metallic materials**

a) Definition (1 mark):

Materials containing metallic elements.

b) Examples (1 mark):

Iron, Aluminium

c) Difference (2 marks):

Ferrous contain iron; non-ferrous do not contain iron.

d) Uses (3 marks):

Used during construction, making utensils, constructing vehicles

38. **Non-metallic materials**

a) Properties (3 marks):

Poor conductors, lightweight, flexible

b) Difference (2 marks):

Natural (wood, cotton);

Synthetic (plastic, nylon)

39. **Tools and safety**

a) Measuring vs Marking (2 marks):

- Measuring tools are tools used to determine the size, length and angles of objects.
- Marking tools are instruments used to transfer dimensions, designs onto a workpiece.

- Measuring tool: Ruler
- Marking tool: Scriber

b) **Hammer safety** (3 marks):

- Wear gloves
- Hold firmly
- Use correct hammer size

c) Care for tools (3 marks):

- Clean after use
- Store properly
- Oil metallic parts

40. **Computer devices** (2 marks)

- Input: Keyboard
- Output: Printer

41. **Entrepreneurship**

a. Entrepreneur (1 mark):

A person who starts and runs a business for the purpose of making profit.

b. Example (1 mark):

Small kiosk/shop.

c. Qualities (2 marks):

Creative, hardworking

42. **Production unit**

a) Definition (1 mark):

Place where goods/services are produced.

b) Examples (2 marks):

Carpentry workshop, tailoring shop

43. **Financial goals**

a) Definition (1 mark):

Target for managing money.

b) Example (1 mark):

Saving for school fees.

c) Short-term financial goals are targets achievable within a short period (weeks to a year), while long-term financial goals require several years or more to accomplish and usually involve larger savings or investments.

GRADE 8

MODEL SAMPLE PAPER 1

SECTION A:

MULTIPLE CHOICE (30 MARKS)

1. C
2. B
3. B
4. C
5. B
6. B
7. B
8. D
9. B
10. B
11. C
12. A
13. C
14. B
15. C
16. C
17. B
18. C
19. B
20. C
21. C
22. B
23. C
24. B
25. B
26. C
27. B
28. C
29. C
30. C

SECTION B (50 MARKS)

31. **Poultry house construction**

a) Tools: Hammer, Saw, Tape measure (3mks)

b) Safety precautions: Wear protective gear, Handle tools carefully (2 marks)

32. Composite materials

a) Examples: Plywood, Fiberglass, Reinforced concrete (3 marks)

33. Stool design

a) Features: Equal leg length, Strong joints, Wide base (3 marks)

b) Reason: Proper alignment ensures stability and strength (1 mark)

34. **Plain scale**

a) Purpose: To represent real measurements proportionally in drawings (1 mark)

b) Conversion: 6cm to represent 120cm. (2 marks)

35. Raised platform

a) Reasons: Reach higher areas, Improve safety and efficiency (2 marks)

b) Precaution: Ensure the platform is stable and secure (1 mark)

36. **Small fruit business**

a) Factors: Accessibility, Availability of customers, Security (3 marks)

b) Benefits: Track profit/loss, Aid in planning (2 marks

37. **Financial records**

a) Liabilities: Bank loan, Accrued electricity bill, Creditors (2 marks)

b) Assets: Office furniture, Cash in hand, Debtors (2 marks)

c) **Income Statement (Amina)**

Revenue: 45,000

Less Expenses:

Vegetables 18,000 + Rent 5,500 + Packaging 2,000 + Transport 1,200 = 26,700

Net Profit = 45,000 – 26,700 = 18,300 (4 marks)

38. **Budget**

a) Definition: A financial plan showing expected income and expenditure (1mk)

b) Importance: Controls spending, Ensures resources are used effectively (2 marks)

39. **Mobile payment**

a) Method: Mobile money transfer i.e Mpesa (1 mark)

b) Advantages: Fast and convenient, safe and traceable (2 marks)

40. **Word processor**

a) Features: Fonts and formatting, Spell check (2 marks)

b) Advantage: Accessible anywhere via internet/cloud (1 mark)

41. **Computer devices**

a) Input devices: Keyboard, Mouse (1 mark)

b) Output device: Monitor - displays processed information (1 mark)

c) Importance: Helps learners understand how data flows in computing (1 mark)

42. **Block-based coding**

a) Definition: Programming using visual blocks instead of text (1 mark)

b) Advantages: Easy to learn, Reduces syntax errors (2 marks)

43. **Computer virus**

a) Signs: Slow performance, Unexpected pop-ups (2 marks)

b) Prevention: Install and update antivirus software (1 mark)

Spreadsheet formula

44. **Formular in cell B5:** (3 marks)

=SUM(B2:B4) or =B2+B3+B4

GRADE 8

MODEL SAMPLE PAPER 2

SECTION A:

MULTIPLE CHOICE (30 MARKS)

1. D
2. C
3. A
4. B
5. C
6. C
7. B
8. A
9. B
10. D
11. B
12. C
13. A
14. B
15. C
16. A
17. B
18. B
19. D
20. C
21. D
22. B
23. B
24. B
25. B
26. A
27. D
28. B
29. B
30. C

SECTION B (50 MARKS)

31. **Pre-Technical Studies and critical thinking** (4 marks)

- Encourages learners to analyze problems and design practical solutions.
- Promotes decision-making by comparing different methods and materials.

32. **Carpentry Tool**

a) Tool: Marking gauge (2 marks)

b) Use: Marking parallel lines to the edge of wood for accurate cutting or joinery

33. **Features of Plain Scale Drawing** (4 mks)

- Has a zero point for accurate measurement.
- Shows proportional divisions to represent real dimensions at reduced scale.

34. Visual Programming

a) **Terms** (3 marks):

- Syntax: Rules that govern how code is written.
- Coding: Writing instructions for a computer to execute.
- Coding blocks: Pre-defined visual elements used to build programs.

b) **Types** (3 marks):

- Scratch
- Blockly
- App Inventor

35. **Composite materials**

a) Examples (4 marks):

- Reinforced concrete ⟶ cement + sand + gravel + steel rods.
- Plywood ⟶ thin layers of wood glued together.
- Fiberglass ⟶ glass fibers + resin.

b) **Importance** (6 marks):

- Stronger and more durable than single materials.

- Lightweight yet tough, making handling easier.
- Cost-effective and versatile for construction and furniture.

36. **Ceramic Materials**

a) Examples (4 marks):

Clay, Glass, Porcelain, Tiles.

b) Properties (6 marks):

- Hard and brittle.
- Heat resistant.
- Poor conductors of electricity.

37. **Bookkeeping in Entrepreneurship**

a) Reasons (6 marks):

- Tracks income and expenses for financial control.
- Helps determine profit or loss.
- Provides records for planning and decision-making.

b. Income Statement (4 marks):

- Sales: 100,000
- Less Cost of Goods Sold: 40,000
- Gross Profit: 60,000
- Less Operating Expenses: 20,000
- Net Profit = 40,000

38. **Roles of Intermediaries** (3 marks)

- Link producers to consumers.
- Facilitate distribution and transportation of goods.
- Provide storage and marketing services.

GRADE 8

MODEL SAMPLE PAPER 3

SECTION A (30 MARKS)

1. C
2. B
3. B
4. D
5. A
6. B
7. D
8. C
9. B
10. B
11. A
12. B
13. D
14. B
15. B
16. C
17. D
18. C
19. B
20. A
21. B
22. C
23. C
24. D
25. B
26. C
27. C
28. C
29. D
30. B

SECTION B (50 MARKS)

31. **Fire safety** (3 marks)
- Install fire extinguishers and alarms.
- Store flammable materials safely.
- Train workers on fire drills and emergency exits.

32. **Artistic vs Technical drawing** (4 mks)
- Artistic drawing is expressive and freehand; technical drawing is precise and uses instruments.
- Artistic drawing focuses on beauty; technical drawing focuses on accuracy and dimensions.

33. **Factors influencing size of production unit** (3 marks)
- Availability of capital.
- Market demand.
- Availability of raw materials.

34. **Visual programming applications** (3 mks)
- Scratch (games and animations).
- Blockly (educational coding).
- App Inventor (mobile apps).

35. **Types of dimensioning** (3 marks)
- Linear dimensioning.
- Angular dimensioning.
- Radial dimensioning.

36. **Uses of composite materials** (3 mks)
- Building houses (reinforced concrete).
- Making furniture (plywood).
- Transport structures (fiberglass in vehicles).

37. **Online threats** (4 marks)
- Viruses.
- Phishing.
- Hacking.
- Malware.

38. **Characteristics of computers** (4 marks)
- Speed.
- Accuracy.
- Storage capacity.
- Automation.

39. **Securing data** (4 marks)
- Use strong passwords.
- Install antivirus software.
- Backup data regularly.
- Encrypt sensitive files.

40. **Unethical practices in budgeting** (3 marks)
- Misuse of funds.
- Inflating costs.
- Falsifying records.

41. **Cutting tools** (2 marks)
- Wood saw
- Jack plane.

42. **Types of computer hardware** (3 marks)
- Input devices (keyboard, mouse).
- Output devices (monitor, printer).
- Storage devices.

43. **ICT tool (smartphone/tablet)**

a) Advantages (2 marks): Portable, supports communication and internet access.

b) Securing data (3 marks): Use passwords/ PINs, install antivirus, avoid unsafe downloads.

44. **Application software** (2 marks)
- Word processor.
- Spreadsheet.

45. **Importance of bookkeeping** (2 marks)
- Tracks income and expenses.
- Helps determine profit or loss.

46. **Fixed vs Variable expenses** (2 marks)
- Fixed: Rent, insurance.
- Variable: Raw materials, transport costs.

GRADE 9

MODEL SAMPLE PAPER 1

SECTION A (30 MARKS)

1. B
2. B
3. D
4. C
5. B
6. A
7. C
8. C
9. C
10. A
11. B
12. B
13. B
14. B
15. B
16. B
17. C
18. C
19. B
20. B
21. B
22. B
23. B
24. A
25. C
26. B
27. B
28. C
29. B
30. C

SECTION B (50 MARKS)

31. Dimensioned rectangle

a) Type of dimensioning: Linear dimensioning (1 mark)

b) Rules:

- Place dimensions outside the view where possible.
- Use clear, neat, and uniform dimension lines. (2 marks)

32. Drawing a horizontal line

a) Procedure: Mark 60 mm on the ruler, align with pencil, draw a straight horizontal line. (2 marks)

b) Accuracy importance: Ensures correct measurements and avoids errors in construction. (1 mark)

33. Oblique projection block

a) Technique: Oblique projection (cavalier) 2 marks

b) Advantage: Shows the front face in true shape and size, making objects easy to interpret. (2 marks)

34. Preparing timber

a) Reason: Prevents defects like warping or decay. (1 mark)

b) Ways: Seasoning (drying), planing (smoothening). (2 marks)

35. Flammable sign

a) Type: Warning safety sign (flammable) (1 mark)

b) Importance: Alerts users to hazards, prevents accidents. (2 marks)

36. Sparks near chemicals

a) Hazard: Fire/explosion hazard (1 mark)

b) Action: Switch off power and remove chemicals immediately. (1 mark)

37. Joining wood with nails

a) Tool: Hammer (1 mark)

b) Precautions: Hold nails carefully, wear protective gear. (2 marks)

38. (Farm tools business)

a) Type: Retail business (1 mark)

b) Characteristics: Sells directly to consumers, deals in small quantities. (2 marks)

39. Budget

a) Definition: A financial plan of income and expenditure. (1 mark)

b) Items: Expected income, expected expenses. (2 marks)

40. Bookkeeping

a) Definition: Recording financial transactions systematically. (2 marks)

b) Components: Cash book, ledger. (1 mark)

c) Receipt details: Date, amount. (2 marks)

d) Importance: Provides proof of transactions. (1 mark)

41. Entrepreneur qualities

a) Qualities: Innovative, risk-taking. (2 marks)

b) Contribution: Innovation helps create new products and attract customers. (1 mark)

42. Marketing

a) Importance: Increases sales, creates awareness. (2 marks)

b) Factor: Target audience. (1 mark)

43. Desktop computer

a) Main part: CPU (1 mark)

b) Components: Monitor, keyboard, mouse. (2 marks)

44. Mouse and keyboard

a) Classification: Both are input devices. (2 marks)

b) Functions: Keyboard enters text; mouse selects and controls items. (1 mark)

45. Icons

a) Definition: Small graphical symbols representing programs/files. (1 mark)

b) Types: Folder icons, application icons. (2 marks)

46. Physical threats

a) Examples: Theft, accidental damage. (2 marks)

b) Protection: Use protective casing/locks. (1 mark)

GRADE 9

MODEL SAMPLE PAPER 2

SECTION A (30 MARKS)

1. B
2. D
3. B
4. B
5. C
6. D
7. B
8. B
9. B
10. C
11. B
12. B
13. C
14. D
15. B
16. C
17. B
18. B
19. B
20. D
21. B
22. B
23. C
24. B
25. B
26. C
27. B
28. D
29. B
30. B

SECTION B (50 MARKS)

31. **Safety on raised platforms** (4 marks)

- Ensure the platform is stable and firmly supported.
- Always maintain three points of contact and avoid overreaching.

32. **Classification of substances** (3 marks)

- Bleach ⟶ Corrosive
- Petrol ⟶ Flammable
- Rat poison ⟶ Poisonous

33. **Career guidance**

a) Nurturing talents (4 marks):

- Join school clubs (e.g. science club to develop innovation).
- Participate in competitions (e.g. drama or robotics contests).

b. Ethical practices (2 marks):

- Use talents honestly without exploiting others.
- Respect teamwork and avoid plagiarism.

34. **Waste handling** (4 marks)

- Recycling ⟶ e.g. turning plastic bottles into new products.
- Composting ⟶ e.g. converting food waste into fertilizer.

35. **Freehand sketch** (3 marks)

Check for a neat oblique sketch of a rectangular prism (cabinet style), sides 4 cm, correctly labelled.

36. **Seasoning timber** (4 marks)

- Reduces moisture to prevent warping and cracking.
- Increases durability and resistance to pests.

37. **Tools identification** (4 marks)

- Holding tool: Bench Vice and Tongs
- Driving tool: Claw Hammer and crocodile clip

38. **Financial institutions** (2 marks)

- Microfinance institutions.
- SACCOs.

39. **Income Statement** (4 marks)

Revenue: 150,000

Less Cost of Sales: 60,000

Gross Profit: 90,000

Less Expenses

(25,000 + 15,000 + 4,000 = 44,000)

Net Profit = 46,000

40. **Government involvement in business** (4 marks)

- Regulation through taxation and licensing.
- Providing infrastructure and support services.

41. **Carpentry workshop location** (2 mks)

- Near raw materials (timber market).
- Accessibility to customers.

42. **Financial goal** (3 marks)

a) Action plan: Save Ksh 6,000 monthly. (2 marks)

b) Benefit: Provides clear direction and discipline in saving. (1 mark)

43. **Device categories** (2 marks)

- Barcode scanner ⟶ Input
- Cloud ⟶ Storage

44. **Email steps** (2 marks)

III Log in ⟶ IV. Open client ⟶

I. Compose ⟶ II. Send

Correct order: 3, 4, 1, 2

45. **Cloud services** (3 marks)

- Google Drive
- OneDrive
- Dropbox

GRADE 9

MODEL SAMPLE PAPER 3

SECTION A (30 MARKS)

1. B
2. A
3. B
4. A
5. C
6. B
7. B
8. C
9. B
10. C
11. B
12. B
13. B
14. C
15. B
16. B
17. C
18. B
19. B
20. B
21. B
22. A
23. A
24. B
25. C
26. C
27. C
28. D
29. B
30. A

SECTION B (50 marks)

31. Artistic drawings
    a) Graffiti
    b) Caricature
    c) Portrait (3 marks)

ii Graffiti ⟶ Bold, colourful lettering or imagery often used for public expression.

Caricature ⟶ Exaggerates features for humor or emphasis.

Portrait ⟶ Realistic representation of a person's face and expression. realistically. (3 marks)

32. **Scale drawing**

a) Reduced dimensions: cm sides (2 marks)

b) Reason: To represent large objects accurately on paper. (1 mark)

33. **Marking gauge**

a) Parts: Stock, Spur/Pin (2 marks)

b) Precaution: Keep spur sharp and handle carefully to avoid injury. (1 mark)

34. **Recycling**

a) Non-metallic materials: Plastic, Glass (2 marks)

b) Products: Plastic ⟶ paving blocks; Glass ⟶ bottles (2 marks)

35. **Oblique cube**

a) Sketch: Cube 5 cm sides, depth at half scale (2.5 cm). (4 marks)

b) Advantage: Cabinet oblique gives realistic depth compared to cavalier. (2 marks)

36. Seasoning timber

a) Reasons: Prevent warping, reduce weight, increase durability. (3 marks)

b) Hardwood: Mahogany. (1 mark)

37. **Geometric shapes**

- Circle ⟶ wheels.
- Triangle ⟶ roof trusses.
- Rectangle ⟶ doors/windows. (3 mks)

38. **Tailoring shop expansion**

a) Factors: Accessibility, customer availability. (2 marks)

b) Way: Advertising/promotions. (1 mark)

39. **Income statement**

Sales: 100,000

Less COGS: 40,000 ⟶ Gross Profit = 60,000

Less Expenses (10,000 + 25,000 + 5,000 = 40,000) ⟶ Net Profit = 20,000 (6 marks)

b) **Reason:** To track profit/loss. (1 mark)

c) **Reduce expenses:** Cut transport costs. (1 mark)

40. **Consumer rights**

a) Government protects by: Setting price controls, enforcing quality standards. (2 marks)

41. **Financial goal**

a) Monthly saving = 18,000 ÷ 6 = 3,000 (2 marks)

b) Benefit: Encourages discipline in saving. (1 mark)

42. **Device categories**

- Mouse ⟶ Input
- Monitor ⟶ Output
- Hard Disk Drive ⟶ Storage (2 marks)

43. **Social media**

a) Benefits: Wider reach, low cost marketing. (2 marks)

b) Platform: Jumia/Instagram. (1 mark)

44. **Scratch program**

a) Input blocks: Ask for length, ask for width, set variable. (3 marks)

b) Operator blocks: (Length + Width) × 2. (2 marks)

c) Output block: "Say" block. (1 mark)

45. **Computer lab safety**

- Use dry hands.
- Report faults.
- Sit properly at work station. (3 marks)

GRADE 9

KJSEA SAMPLE PAPER 1

SECTION A (30 MARKS)

1. B
2. D
3. C
4. B
5. A
6. A
7. D
8. C
9. D
10. B
11. A
12. A
13. A
14. D
15. C
16. A
17. A
18. D
19. A
20. C
21. B
22. A
23. C
24. A
25. D
26. C
27. B
28. A
29. A
30. C

SECTION B (50 marks)

31. **Three ways to handle electrical hazards** (3 marks)

- Switch off and isolate faulty circuits before working

- Use insulated tools and wear rubber-soled footwear
- Keep wiring tidy and report exposed conductors immediately

32. **Difference between input and output devices; two examples each** (4 marks)

Input devices (2 marks):

Scanner and Joystick

Output devices (2marks)

Speakers and head phones

33. **Two advantages of ICT in professional communication** (2 mks)

Enables real-time collaboration across distances

Provides rich media (video, shared documents) to enhance clarity

34. **Four properties of non-metallic materials** (4 marks)

- Low electrical conductivity
- Corrosion resistance
- Lightweight
- Ease of molding or shaping

35. **What is an alloy?** (2 marks)

i. A homogeneous mixture of two or more metals (or a metal and another element)

b. **Three uses of non-ferrous metals** (3 marks)

- Copper in electrical wiring (excellent conductivity)
- Aluminum in aircraft components (lightweight and corrosion-resistant)
- Brass fittings in plumbing (good strength and corrosion resistance)

36. **Vernier caliper (instrument identification)** (2 marks)

a) Tool: Vernier caliper

b) Label any two parts of the vernier caliper (2 marks)

- Jaws
- Main scale or vernier scale (either one)

c) Use of the tool (1 mark): Precise measurement of internal/external dimensions to 0.01 mm

37. **Two challenges in setting up a production unit** (3 marks)

a) Securing sufficient startup capital

b) Recruiting and training skilled staff

c) Ensuring reliable supply of raw materials

38. **What is a hazardous substance?** (2 marks)

i. Any material that can cause harm to health, environment or property if mishandled

ii. Three reasons for labeling hazardous substances (3 marks)

- To warn users of potential risks
- To provide safe handling and storage instructions
- To comply with legal/regulatory requirements

39. **Four ways to nurture talents in school clubs** (4 marks)

a) Provide regular mentorship or coaching sessions

b) Organize workshops and skills competitions

c) Offer constructive feedback and goal-setting

d) Facilitate peer collaboration and resource sharing

40. **Sketch a prism in oblique projection with given dimensions** (4 marks)

- Marking will check: correct 3D oblique shape, 4 cm height, 2 cm width, appropriate depth receding at an angle

41. Hardwood (2marks)

42. **Outline two unethical practices in entrepreneurship** (3 marks)

a) False or misleading advertising

b) Price gouging in times of need

c) Copyright infringement (copying competitors' work)

43. **Meaning of "entrepreneurship" in business** (2 marks)

- Entrepreneurship is the process of creating and managing a business by identifying opportunities, taking risks and organizing resources to provide goods or services for profit

b) Two consumer-protection agencies in Kenya (2 marks)

- Kenya Bureau of Standards (KEBS)
- Competition Authority of Kenya (CAK)

c) Role of regulators in business (2 marks)

- Ensure fair competition and protect consumer rights
- Enforce safety, quality and ethical standards

GRADE 9

KJSEA SAMPLE PAPER 2

SECTION A (30 MARKS)

1. D
2. B
3. A
4. B
5. D
6. A
7. A
8. B
9. B
10. C
11. B
12. A
13. D
14. B
15. A
16. D
17. B
18. C
19. B
20. A
21. B
22. B
23. D
24. B
25. B
26. A
27. B
28. A
29. A
30. C

SECTION B (50 MARKS)

31. **Safety practices in workshop** (3 marks)

- Wear protective gear (gloves, goggles, aprons).
- Keep the workspace clean and free of hazards.
- Ensure first-aid kit and emergency exits are accessible.

32. **Software categorization**

a) Difference (2 marks):

- System software controls and manages computer hardware and basic operations.
- Application software enables users to perform specific tasks.

b) Examples (4 marks):

- System software: Operating system (Windows), Utility program (Antivirus).
- Application software: Word processor (MS Word), Spreadsheet (Excel).

33. **Line types in technical drawing** (6 marks)

- Continuous thick line ⟶ Represents visible outlines and edges.

- Dashed thin line ⟶ Represents hidden details not visible in the view.
- Chain line ⟶ Represents center lines or paths of motion.

34. **ICT tools for team communication** (2 marks)

- Email.
- Video conferencing tools (Zoom, Tims).

35. **Composite materials** (4 marks)

a) Examples: Reinforced concrete, Plywood.

b) Applications: Reinforced concrete ⟶ building structures; Plywood ⟶ furniture making.

36. **Freehand sketching** (10 marks)

a) Techniques (6 marks):

- Use light guiding lines before darkening.
- Maintain correct proportions.
- Apply shading or hatching for clarity.

b) Sketch: Rectangular school field with four 100m running tracks (4 marks).

37. **Business balances** (7 marks)

a) Cost of Goods Sold (3 marks):

COGS = Opening Inventory + Purchases - Closing Inventory

= 15,000 + 25,000 – 1,000 = 39,000

b) **Importance of financial planning** (4 marks):

- Helps control spending and avoid losses.
- Ensures resources are allocated effectively for growth.

38. **Drawing task** (4 marks)

- Neat sketch of a rectangle (150 mm × 100 mm) touching a circle of radius 44 mm.

39. **Preventing rust** (3 marks)

- Apply oil or grease on tools.
- Store tools in dry conditions.
- Paint or galvanize metal surfaces.

40. **Ethical practices** (5 marks)

a. Definition (2 marks):

Ethical practices are professional behaviours guided by honesty, fairness and respect.

b. Examples (3 marks):

- Using talents responsibly without exploitation.
- Respecting intellectual property.
- Practicing fairness and integrity in work

GRADE 9

KJSEA SAMPLE PAPER 3

SECTION A (30 MARKS)

1. D
2. C
3. C
4. B
5. C
6. C
7. C
8. C
9. D
10. B
11. B
12. B
13. B
14. C
15. C
16. D
17. C
18. D
19. B
20. D
21. B
22. B
23. B
24. D
25. C

26. C
27. B
28. A
29. B
30. D

SECTION B (50 marks)

31. **Financial institutions in Kenya**

a) Examples: Commercial banks, SACCOs, Microfinance institutions, Insurance companies. (2 marks)

b) Classifications: Banking institutions, Non-banking financial institutions. (2 marks)

32. **Tool for checking 90° angle**

- Try square. (1 mark)

33. **Raised platforms**

a) Type: Trestle. (1 mark)

b) Other examples: Ladder, Scaffolding, work bench and Stage. (2 marks)

34. **Dimensioning types**

- Linear, Angular, Radial. (3 marks)

35. **Difference between cavalier and cabinet oblique**

- Cavalier: Depth drawn full scale.
- Cabinet: Depth drawn half scale. (2 mks)

36. **Threats to digital devices**

- Viruses, Malware, Phishing, Theft. (2 mks)

37. **Types of taxes in Kenya**

- Income tax, Value Added Tax (VAT) (2marks)

38. **Types of computers**

- Analogue computers, Digital computers and hybrid computers (3 marks)

39. **Composite materials**

a) Items: Plywood furniture, Reinforced concrete blocks. (2 marks)

b) Binding material: Matrix. (1 mark)

40. Scale drawing

Car length = 4 m = 400 cm.

Scale 1:50 ⟶ 400 ÷ 50 = 8 cm. (2 marks)

41. **Business contribution to community**

- Creates employment.
- Provides goods/services.
- Generates tax revenue. (3 marks)

42. **Non-metallic materials**

- Glass, Rubber. (2 marks)

43. **ICT communication tools**

- Email, Social media, Video conferencing, Instant messaging. (2 marks)

44. **Characteristics of computers**

- Speed, Accuracy, Storage. (3 marks)

45. **Factors of production**

- Land and Labour. (2 marks)

46. **Types of computer hardware**

- Input devices, Output devices, Storage devices. (3 marks)

47. **Factors in selecting communication channels**

- Cost – choose a method that is affordable.
- Speed – use a channel that delivers the message quickly.
- Accessibility – ensure the audience can easily receive and understand the message. (3 marks)

48. **Methods of firefighting**

- Cooling, Smothering, Starving. (3 marks)

49. **Roles of Pre-Technical Studies**

- Develops practical skills.
- Promotes problem-solving.
- Prepares learners for careers. (3 marks)