Grade 7 Pre-Technical Studies

Terms 1, 2 and 3 - notes for 14 topics

IN EVERY TOPIC

- What you will learn and the key words.
- Short, clear notes with worked examples.
- Questions to try and a topic test, with the answers at the back.

TOPICS IN THESE NOTES

Topic	Name	Term
1.1	Introduction to Pre-Technical Studies	1
1.2	Safety in the Immediate Environment	1
1.3	Computer Concepts	1
2.1	Introduction to Drawing	1
2.2	Free-hand Sketching	1
2.3	ICT Tools in Communication	1
3.1	Introduction to Materials	2
3.2	Metallic Materials	2
3.3	Non-Metallic Materials	2
4.1	Measuring and Marking Out Tools	2
4.2	Computer Hardware	3
5.1	Introduction to Entrepreneurship	3
5.2	Production Unit	3
5.3	Financial Goals	3

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CONTENTS

Topic	Name	Term	Page
1.1	Introduction to Pre-Technical Studies	1	3
1.2	Safety in the Immediate Environment	1	5
1.3	Computer Concepts	1	7
2.1	Introduction to Drawing	1	9
2.2	Free-hand Sketching	1	12
2.3	ICT Tools in Communication	1	16
3.1	Introduction to Materials	2	19
3.2	Metallic Materials	2	21
3.3	Non-Metallic Materials	2	24
4.1	Measuring and Marking Out Tools	2	27
4.2	Computer Hardware	3	33
5.1	Introduction to Entrepreneurship	3	36
5.2	Production Unit	3	39
5.3	Financial Goals	3	42
	Answers		46

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Strand 1.0 Foundations of Pre-Technical Studies | Term 1

1.1 Introduction to Pre-Technical Studies

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- identify the components of Pre-Technical Studies as a learning area
- explain the role of Pre-Technical Studies in day-to-day life
- embrace Pre-Technical Studies in career development

KEY WORDS

Pre-Technical Studies, technical, career, entrepreneurship, materials, tools, drawing, computing.

1. Components of Pre-Technical Studies

Pre-Technical Studies is a Junior School learning area that introduces the knowledge and skills used in technical work.

Its components, as in this design's strands: foundations (safety and computer concepts); communication (drawing, sketching and ICT tools); materials for production (metals and non-metals); tools and production (measuring, marking out and computer hardware); entrepreneurship (business ideas, production and money goals).

It joins thinking, making and selling: design it, make it, sell it.

2. The role of Pre-Technical Studies in day-to-day life

Roles in daily life

Safety at home, at school and online.

Repairing and maintaining items (a broken chair, a loose hinge).

Communicating ideas with drawings and ICT tools.

Choosing the right materials and tools for a job.

Making useful items and saving money.

Starting small businesses and creating jobs.

3. Careers linked to Pre-Technical Studies

Careers: carpenter, mason, plumber, electrician, welder, mechanic, tailor, architect, engineer, draughtsperson, graphic designer, computer technician, software developer, entrepreneur.

Many can be studied at TVET colleges, polytechnics and universities.

The Senior School STEM pathway (for example technical and engineering subjects) builds on this learning area.

4. Debate: Pre-Technical Studies in day-to-day life

Motion: "Pre-Technical Studies is more useful in daily life than any other learning area."

Rules: one speaker at a time; respect others' opinions; use facts and examples; time limit of two minutes each.

After the debate: each learner writes two reasons why the subject matters for their own future career.

TRY THESE

1. Name three components of Pre-Technical Studies.
2. Which component deals with keeping people safe?
3. Give two roles of Pre-Technical Studies in daily life.
4. How can drawing help a carpenter?
5. Name three careers linked to this subject.
6. Which career uses technical drawing daily?
7. Give one point for the motion.

8. Give one point against the motion.

TOPIC TEST

T1. Which component interests you most? Why?

T2. Present one role to the class with an example.

T3. Interview an adult with a technical job and report.

T4. Write a short paragraph on how the subject links to your dream career.

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Strand 1.0 Foundations of Pre-Technical Studies | Term 1

1.2 Safety in the Immediate Environment

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- identify potential safety threats in the immediate environment
- outline safety rules and regulations for a given situation
- observe safety in the immediate environment

KEY WORDS

hazard, threat, phishing, hacking, cyberbullying, impersonation, password, first aid.

1. Physical safety threats

A hazard is anything that can cause harm.

Threats to personal safety (from the design): falls, slips, trips, road crashes, fires.

Causes: wet floors, loose cables, open drains, broken steps, careless crossing of roads, unattended fires, overloaded sockets.

Threats to digital devices: theft, natural disasters (floods, lightning), hardware failure (dropping, overheating, power surges).

2. Online threats

Online threats (from the design)

Cyberbullying: hurting someone with messages, posts or photos online.

Impersonation: pretending to be someone else online.

Phishing: fake messages or links that trick you into giving passwords, PINs or money.

Hacking: getting into someone's account or device without permission.

Friend requests from unknown people: some are strangers who may want to harm or trick you.

3. Protecting self and others from physical threats

Falls, slips, trips: walk, do not run, in corridors; wipe spills; keep floors clear; use handrails.

Road safety: cross at zebra crossings; look right, left, right; never play on the road; wear reflective clothing at night.

Fire: do not play with matches; switch off appliances; know the exit and assembly point; stop, drop and roll if clothes catch fire.

Device safety: keep devices away from water and heat; switch off during lightning storms; keep them in a safe place.

4. Staying safe online

Online safety rules

Use strong passwords (long, with letters, numbers and symbols); never share them.

Never share your home address, school, phone number or photos with strangers.

Do not click links or open attachments from unknown senders.

Do not accept friend requests from people you do not know in real life.

Be kind online; do not forward hurtful messages.

If something online upsets or scares you: do not reply, keep the evidence, block and tell a trusted adult. Childline Kenya: call 116 (free).

5. Safety rules for tasks, materials and tools

General workshop rules

Follow the teacher's instructions; never use a tool you have not been shown.
Wear protective clothing (overalls or aprons, closed shoes; goggles and gloves where needed).
Carry sharp tools pointing down; pass them handle first.
Keep the work area clean and tidy; put tools back after use.
Report damaged tools and any injury at once.
Do not play or run in the workshop or laboratory.

6. Role play: safety for self and others

Groups role play one scene: a spill in the corridor; crossing a busy road; a small fire in the kitchen; a phishing message; a stranger's friend request; a classmate being cyberbullied.

Each scene shows the threat and the safe response.
Class discussion: why safety matters (prevents injury, death, loss of property and data).

TRY THESE

1. What is a hazard?
2. Name three threats to personal safety.
3. What is phishing?
4. What is cyberbullying?
5. How should you cross a road?
6. What do you do if your clothes catch fire?
7. Give one feature of a strong password.
8. Name two details never to share with strangers.
9. How are sharp tools passed?
10. Name two items of protective clothing.
11. Give one reason why safety is important.
12. What is the safe response to a phishing message?

TOPIC TEST

T1. How can a power surge be prevented from damaging a computer?
T2. Give two signs that a message is phishing.
T3. Draw the escape route from your classroom to the assembly point.
T4. Is "ilovekenya" a strong password? Improve it.
T5. Write three safety rules for the computer room.
T6. Make a safety poster for the school notice board.

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Strand 1.0 Foundations of Pre-Technical Studies | Term 1

1.3 Computer Concepts

WHAT YOU WILL LEARN

By the end of this topic you should be able to:

- explain the characteristics of a computer in a user environment
- classify computers used in day-to-day life
- use a computer to perform tasks in a user environment
- acknowledge the importance of different types of computers used in day-to-day life

KEY WORDS

computer, data, information, diligence, versatility, analogue, digital, hybrid, supercomputer, microcomputer.

1. Computer, data and information

A computer is an electronic device that accepts data, processes it according to instructions, stores it and gives out information.

Data: raw facts (for example the marks 56, 72, 81).

Information: processed data that has meaning (for example "the average mark is 69").

Input, process, output, storage: the four basic functions.

2. Characteristics of a computer

Characteristics (from the design)

Speed: processes millions of instructions per second.

Accuracy: gives correct results if the data and instructions are correct ("garbage in, garbage out").

Versatility: can do many different tasks.

Reliability: works for long periods without failing.

Diligence: does not get tired or bored.

Storage: keeps large amounts of data.

Consistency: gives the same result each time for the same input.

3. Classifying computers by functionality

By functionality (the type of data processed)

Analogue computers: work with continuously changing data such as temperature or speed (for example an old needle speedometer, a fuel gauge).

Digital computers: work with numbers in steps (0 and 1) (for example laptops, phones, calculators).

Hybrid computers: combine both (for example hospital machines that monitor heartbeat and show it as numbers, some fuel pumps).

4. Classifying computers by purpose and size

By purpose: general-purpose (can do many tasks, for example a laptop) and special-purpose (one task, for example an ATM, a traffic light controller, a microwave oven controller).

By size (from largest): supercomputers (weather forecasting, space research), mainframes (banks, large organisations), minicomputers (medium businesses), microcomputers (desktops, laptops, tablets, smartphones).

Larger computers are faster and can serve many users at once.

5. Practical: using a computer to perform tasks

Practical: computer tasks

Materials: computers, laptops, tablets or phones.

Start up correctly; log in.

Open a program (a word processor or calculator); type a short paragraph about yourself; save it with a clear name.

Use the calculator to add a list of numbers.

If online, watch a short video on classification of computers from a trusted site (cyber security: do not download unknown files).

Close programs and shut down correctly.

Care: clean hands, no food or drinks, handle gently.

6. Importance of different types of computers: review

Uses in daily life: M-Pesa and banking (mainframes and phones); weather forecasts (supercomputers); hospitals (hybrid monitors); schools (laptops, tablets); supermarkets (point-of-sale computers); traffic lights and ATMs (special-purpose).

Classification helps people choose the right computer for a job.

Groups present one place and the computers used there.

TRY THESE

1. What is a computer?
2. What is data?
3. What does diligence mean for a computer?
4. What does "garbage in, garbage out" mean?
5. Name three classes by functionality.
6. Which type processes data in 0s and 1s?
7. Give an example of a special-purpose computer.
8. Which is the largest class of computer by size?
9. How should a computer be switched off?
10. Why save work with a clear name?
11. Name a computer used in banking.
12. Why classify computers?

TOPIC TEST

T1. Is a list of names data or information? When could it become information?

T2. Which characteristic matters most to a hospital? Why?

T3. Why do petrol stations use hybrid pumps?

T4. Classify a smartphone by functionality, purpose and size.

T5. Create a folder and save your file into it.

T6. Find out which computer the Kenya Meteorological Department uses for forecasts.