Grade 6 ICT – Final Study Guide

UNIT 1 – LESSON 1

Changes and Improvements in Technology

1. New Technologies

a) Virtual Reality (VR)

You wear a VR headset and feel like you are inside a different world.

You can look around, move, and interact in games, tours, etc.

Used for games, travel simulations, training (for example, pilots).

b) Artificial Intelligence (AI)

When computers or machines can do things that usually need human thinking.

Examples:

Recommendation systems (YouTube, Netflix suggestions)

Self-driving cars

Smart assistants that understand speech

c) Virtual Assistant

A program that listens, understands, and does tasks for you.

You can talk or type to it.

Examples: Siri, Google Assistant, Alexa.

2. How Technology Changes Our Lives

Technology affects these big areas: communication, learning, entertainment, lifestyle.

a) Communication

Social media – share photos, messages, and updates (e.g., Instagram).

Online video meetings – see and talk to people in other places (Zoom, Teams).

Email – send written messages and files.

b) Learning

Digital learning – online classes, recorded lessons, educational websites.

Digital books (e-books) – books you read on a screen; many books in one device.

c) Entertainment

Video games on consoles, computers, or phones.

VR games make you feel you are inside another world.

Online media – watch videos/movies, listen to music.

d) Lifestyle

Online shopping – buy things from any place with a few clicks.

House automation devices – control lights, temperature, etc., from your phone.

Health & fitness devices – smartwatches that track steps, heart rate, sleep.

3. Positive vs Negative Effects

Examples:

Communication

Positive: stay connected with family and friends anywhere.

Negative: people may bully others online or spend too much time on their phones.

Learning

Positive: easy access to information and online lessons.

Negative: not all information on the internet is true.

Entertainment

Positive: games and music can relax and entertain.

Negative: too much screen time can hurt eyes and health.

Lifestyle

Positive: easier shopping, tools to manage health.

Negative: people may move less, eat more fast food.

4. Technology and Careers

Technology creates new jobs and changes old ones.

Manufacturing – robots help make things in factories, do dangerous or repetitive work.

Commerce (Business) – people sell and buy online; jobs in online stores, delivery, marketing.

Data and Information – people study data to understand customers, money, health, etc.

Education – online teachers, educational content creators, IT support in schools.

5. Human–Computer Interaction (HCI)

HCI = how people and computers work together. Goal: make technology:

Available for everyone – people with disabilities can use it (e.g., screen readers).

Comfortable design – devices fit your hand, screen is easy to see.

Easy to learn – simple menus, clear buttons.

6. Troubleshooting

Troubleshooting = finding and fixing problems in technology.

Four basic steps

Identify the problem

“The laptop is not charging.”

Think of what may have caused it

Maybe the charger is broken, or the outlet has no power.

Make sure everything works

Check the cable, plug in another device, try another outlet.

Try one solution and see if it fixes the problem

Use a different charger; if the laptop charges, the problem was the first charger.

7. Engineering Design & Improving Inventions

Engineers use a step-by-step process to create or improve inventions:

Identify the problem – What needs to be solved?

Look for existing ideas – What solutions already exist?

Brainstorm – Think of many ideas.

Make a plan / build a prototype – Choose the best idea and build a model.

Test and improve – Try it, see what doesn't work, change it.

To improve an invention, they:

Choose the right information (which facts matter).

Study how data (size, speed, cost) affects results.

Test again and again, making small changes.

UNIT 1 – LESSON 2

Secure Your Online Information

1. Public vs Private Information

Public Information

Safe to share with everyone.

Examples:

Your favourite hobbies

Pictures of flowers or sunsets

A review of your favourite book

Private Information

Should not be shared with strangers or posted everywhere.

Share only with people you really trust.

Examples:

Home address

Phone number

Passwords and PINs

Credit card number

2. Social Engineering & Scams

Social engineering: when someone tricks you into giving private information.

Scammers might:

Pretend to be your bank, your school, or even a friend.

Send fake emails or messages (“phishing”).

Ask for passwords or credit card numbers.

Advice:

Don’t click strange links.

Don’t send private info by message.

If unsure, ask an adult or contact the real company using official contacts.

3. Staying Safe – Physical Security Rules

Physical security = protecting the device itself.

Keep passwords written in a safe place (not on the monitor!).

Hide the keyboard when typing passwords.

Don’t share your device unlocked with others.

Always log out of accounts and close sessions when you finish.

Make backup copies of important data on an external drive or cloud.

4. Digital Security Rules

Digital security = protecting the information in your device.

Use strong passwords:

Mix letters, numbers, and symbols.

Avoid name, birthday, “123456”, etc.

Use a different password for each important account.

Update your computer/phone and antivirus software.

Before entering information on a website:

Check that the address starts with https://

Look for a lock icon in the address bar.

5. Encryption & Caesar Cipher

Encryption = turning a normal message into a secret code so others can’t read it.

Caesar Cipher

A simple encryption method used in the lesson.

You shift each letter by a certain number of steps in the alphabet.

Steps to use it:

Pick a secret key

Example: key = 3 → each letter moves 3 steps forward.

Write the alphabet in a row, then below it write the shifted alphabet.

A → D, B → E, C → F, … (with key 3).

Encrypt a message

Replace every letter with the new one.

Example: with key 3

HELLO → KHOOR

Decrypt (undo) the message

Move letters back 3 steps.

Caesar Cipher is not very secure today, but it helps you understand the idea of encryption.

UNIT 2 – LESSON 1

Clean and Change Data

1. What Is Data?

Data = information (words, numbers, pictures, sounds).

Computers can store, read, and share data.

Data must be correct and organized to be useful.

Raw data: Data that has not been sorted or cleaned yet.

May contain mistakes, missing values, or duplicates.

2. Making Sense of Raw Data

We often use Microsoft Excel to organize data into rows and columns.

Important actions:

Data collection – get information from different sources.

Data cleaning – fix or remove incorrect data.

Sorting – arrange data in a sensible order (A–Z, Z–A, smallest to largest).

Filtering – show only some rows that match a condition.

Changing data forms – change a table into a chart or another view.

3. How Can We Collect Data?

Many devices collect data automatically. Examples:

Thermometers → temperature

Light sensors → brightness

GPS → location on a map

Microphones → sounds

Cameras → photos and videos

Heart-rate monitors → pulse and heart activity

Smartphones → many types of data (location, steps, apps used)

After collecting, we put data into a document or spreadsheet for analysis.

4. How to Clean Data

Raw data usually has problems. Data cleaning means fixing them.

a) Spot the errors

Look for:

Missing information

Wrong information

Duplicate (repeated) rows

b) Remove empty rows

Delete rows where all or most cells are empty (e.g., using Delete Sheet Rows in Excel).

c) Add missing data

If you know the correct values, fill them in.

d) Fix incorrect data

Examples from the lesson:

Spelling mistake: writing Februery instead of February.

Wrong number: age written as 21 instead of 12.

Data in wrong place: email address in the phone number column.

e) Remove duplicate data

Use Conditional Formatting to highlight duplicates.

Then use Remove Duplicates in the Data tab to delete repeated rows.

5. Example – Cleaning a Grade Book

Before Cleaning Data

Student name	Test 1 score	Test 2 score	Test 3 score
Student 1	95	88	92
Student 2	87		94
Student 3	78	85	79
Student 4		91	76
Student 5	92	86	196
Student 3	78	85	79

After Cleaning Data

Student name	Test 1 score	Test 2 score	Test 3 score
Student 1	95	88	92
Student 2	87	90	94
Student 3	78	85	79
Student 4	85	91	76
Student 5	92	86	96

The image shows a teacher's table before and after cleaning.

Before cleaning, problems include:

Missing Test 2 score for Student 2.

Missing Test 1 score for Student 4.

Student 5 Test 3 score = 196 (impossible if the test is out of 100).

Student 3 listed twice.

After cleaning:

Missing scores are filled in (correct marks).

196 changed to 96.

Duplicate row for Student 3 removed.

Idea:

Cleaning data makes sure the teacher has correct and complete information before calculating averages or grades.