G.C.E. O/L Grade 11 ICT · Lesson 6

6.9 Health, Safety and E-waste: Ergonomics, RSI, Eye Strain and Safe Disposal

Syllabus 15.9. Using computers for a long time in a bad way can hurt our body, and old electronic equipment can harm the environment. You will learn about **ergonomics**, **RSI**, **eye strain**, **backache**, **e-waste** and how to **dispose of** old devices safely.

1. Ergonomics

Ergonomics means designing the workplace (chair, desk, screen, keyboard) to fit the human body so that people can work safely and comfortably.



Good sitting position at a computer.

2. Health issues

Problem	Cause	Prevention
RSI (Repetitive Strain Injury)	Doing the same hand movement (typing, mouse, phone) for a long time	Keep wrists straight, use a wrist rest, stretch and rest often
Eye strain	Looking at a bright screen for a long time; glare	Follow the 20-20-20 rule, reduce glare, blink often
Backache and neck pain	Bad posture; bending over a laptop or phone	Adjustable chair with back support; screen at eye level

💡 **20-20-20 rule:** every **20 minutes**, look at something about **6 metres** (20 feet) away for **20 seconds**. In a 2-hour study session that is **6** short eye breaks.

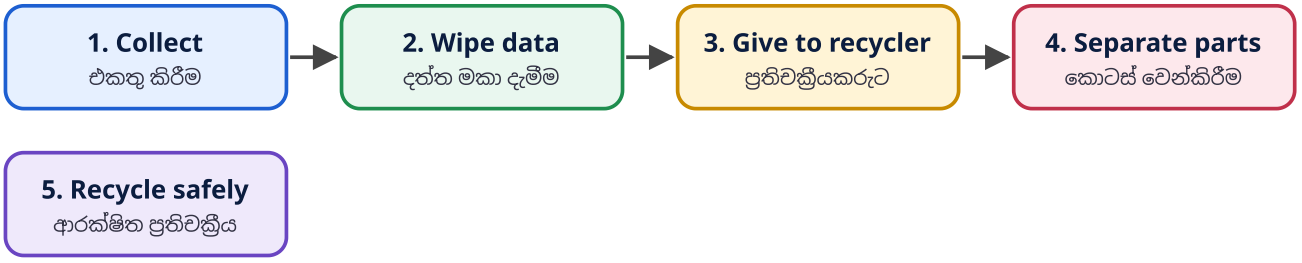
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3. E-waste

E-waste is old or broken electronic equipment: phones, computers, monitors, batteries and printers. It contains **hazardous elements** that are dangerous if thrown away with normal rubbish or burned.

Hazardous element	Found in	Harm
Lead	Old CRT monitors, solder	Damages the brain and nerves
Mercury	Old screen backlights, switches	Poisons water and fish
Cadmium	Rechargeable batteries	Harms kidneys
Lithium	Phone and laptop batteries	Can catch fire if crushed

4. Safe disposal and destruction



Reduce, reuse, recycle and safe disposal of e-waste.

- **Reuse:** repair, or donate working devices to schools.
- **Recycle:** give e-waste to an approved collector (e.g. through the Central Environmental Authority programmes).
- **Never** burn e-waste or throw it in rivers or normal bins.
- **Destroy data first:** wipe or reset the device; break the hard disk if it held secret data.

> NEW 2026 2026: people change phones often, so e-waste is growing fast. Long **phone use** causes “text neck” and poor sleep – keep phones away at bedtime and use night mode.

Key Words

Ergonomics – Designing the workplace to fit the human body.

RSI – Pain in hands, wrists or arms from repeating the same movement.

Eye strain – Tired, dry or sore eyes from looking at screens too long.

Backache – Back pain caused by bad sitting posture.

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Posture – The way you hold your body when sitting or standing.	**Glare** – Strong light reflecting off the screen.
20-20-20 rule – Every 20 minutes look 6 m away for 20 seconds.	**E-waste** – Old or broken electronic equipment.
Hazardous element – A dangerous substance such as lead or mercury.	**Recycling** – Taking useful materials out of old devices to use again.
Safe disposal – Getting rid of e-waste without harming people or nature.	**Data destruction** – Wiping or breaking storage so no one can read old data.

Sample Q&A

1. What is ergonomics?

> **Answer:** Designing the workplace to fit the body so we work safely and comfortably.

2. What causes RSI and how can we prevent it?

> **Answer:** Repeating the same movement; keep wrists straight, stretch and rest often.

3. Explain the 20-20-20 rule.

> **Answer:** Every 20 minutes look about 6 m away for 20 seconds.

4. How can you avoid backache at a computer?

> **Answer:** Sit straight with back support, feet flat and the screen at eye level.

5. Name two hazardous elements in e-waste.

> **Answer:** Lead and mercury (also cadmium and lithium).

6. Why should you wipe data before giving away an old phone?

> **Answer:** So no one can read your photos, messages and passwords.

MCQ

1. Pain in the wrist from typing for many hours is

A. RSI
B. CAD
C. BPO
D. UPS

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2. Under the 20-20-20 rule, how many eye breaks are needed in 2 hours?

A. 4
B. 6
C. 20
D. 12

3. The top of the monitor should be

A. at about eye level
B. on the floor
C. far above the head
D. behind you

4. Designing chairs and desks to fit the body is

A. piracy
B. e-commerce
C. ergonomics
D. rendering

5. Which element in old CRT monitors damages the brain and nerves?

A. oxygen
B. nitrogen
C. lead
D. carbon

6. The best way to get rid of an old laptop is to

A. throw it in a river
B. bury it in the garden
C. burn it
D. wipe it and give it to an approved recycler

7. Strong light reflecting off the screen is called

A. surge
B. glare
C. spam
D. mixing

8. A swollen phone battery should be

A. taken to an e-waste collection point
B. put in a fire
C. kept under the pillow
D. crushed with a hammer

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9. Which term means: “Designing the workplace to fit the human body”?

A. Hazardous element
B. Ergonomics
C. Glare
D. Backache

10. Which term means: “Pain in hands, wrists or arms from repeating the same movement”?

A. 20-20-20 rule
B. Recycling
C. RSI
D. Posture

11. Which term means: “Tired, dry or sore eyes from looking at screens too long”?

A. Eye strain
B. Glare
C. Safe disposal
D. E-waste

12. Which term means: “Back pain caused by bad sitting posture”?

A. 20-20-20 rule
B. Data destruction
C. Backache
D. Hazardous element

13. Which term means: “The way you hold your body when sitting or standing”?

A. Ergonomics
B. E-waste
C. Recycling
D. Posture

14. Which term means: “Strong light reflecting off the screen”?

A. Hazardous element
B. RSI
C. Safe disposal
D. Glare

15. Which term means: “Every 20 minutes look 6 m away for 20 seconds”?

A. Recycling
B. 20-20-20 rule
C. Eye strain
D. Data destruction

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Structured Questions

1. Name three health problems from long computer use and give one prevention for each. *(3 marks)*

> RSI – rest and wrist support (1); eye strain – 20-20-20 rule (1); backache – good chair and posture (1)

2. What is ergonomics? Give two features of a good computer workstation. *(3 marks)*

> Fitting the workplace to the body (1); adjustable chair with back support (1); screen at eye level about an arm's length away (1)

3. Kamal studies at a screen for 3 hours. Using the 20-20-20 rule, how many eye breaks should he take, and what does he do in each? *(3 marks)*

> 180 ÷ 20 = 9 breaks (1); look about 6 m away (1); for 20 seconds (1)

4. What is e-waste? Name two hazardous elements and their harm. *(3 marks)*

> Old or broken electronics (1); lead – harms the brain (1); mercury – poisons water (1)

5. Give three safe ways to dispose of old electronic equipment. *(3 marks)*

> Reuse or donate (1); give to an approved recycler (1); wipe or destroy data first (1)

Summary

- Ergonomics fits the workplace to the body.
- RSI comes from repeating the same movement.
- Eye strain: use the 20-20-20 rule and reduce glare.
- Backache: good chair, straight back, screen at eye level.
- E-waste = old or broken electronics.
- Hazardous: lead, mercury, cadmium, lithium.
- Reduce, reuse, recycle – never burn e-waste.
- Wipe or destroy data before disposal.

MCQ answer key – 6.9

1. **A** – Repetitive Strain Injury.
2. **B** – 120 ÷ 20 = 6.
3. **A** – Avoids neck and eye strain.
4. **C** – Ergonomics = fit to the body.
5. **C** – Lead is hazardous.
6. **D** – Safe disposal and data destruction.
7. **B** – Glare causes eye strain.

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8. **A** – Lithium can catch fire.
9. **B** – Ergonomics – Designing the workplace to fit the human body.
10. **C** – RSI – Pain in hands, wrists or arms from repeating the same movement.
11. **A** – Eye strain – Tired, dry or sore eyes from looking at screens too long.
12. **C** – Backache – Back pain caused by bad sitting posture.
13. **D** – Posture – The way you hold your body when sitting or standing.
14. **D** – Glare – Strong light reflecting off the screen.
15. **B** – 20-20-20 rule – Every 20 minutes look 6 m away for 20 seconds.

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