

Learner Full Name: _____ School: _____

Assigned Workstation: _____ Class: _____

Session 41: Skills Lab 5: Code & AI Challenge

This is the last Skills Lab before your capstone project! You have learnt to code in Scratch, build web pages, train an AI and use AI wisely. Today you will show it at four challenge stations. Everything you prove today is a skill you can use in your capstone, and it counts towards your **Gold Passport** 🏆 on Demo Day.

1. How a Skills Lab Works

1. Typing check first

The 3-minute check in the typing trainer. Record it below.

2. Four stations

Pages 2–5, each with a brief and a time limit. Try it without the hints first.

3. Mentor check

Hand up when you finish. Your mentor ticks the checklist and initials it.

4. Fix and re-try

Go back to any station you didn't finish, with the hints. Then fill in Page 6.

2. Typing Check: On the Way to Gold (35 wpm at 95%)

Typing check	Speed (wpm)	Accuracy (%)	Trainer stage reached
My Silver check (Skills Lab 4)	_____	_____	_____
Today's check	_____	_____	_____

Gold target already met today? ☐ Yes ☐ Not yet: I need _____ more wpm and _____ more % accuracy by Demo Day.

3. The Skills You Are Proving Today (Block 6)

Station	Skill	Learnt in
1	Build a game with a loop, a condition and a score	Sessions 36–37: Scratch
2	Build a one-page website or HTML page	Session 38: Build a Web Page
3	Train an AI with good examples and explain it	Session 39: What Is AI?
4	Fact-check AI answers and write a C.L.E.A.R. prompt	Session 40: Using AI Wisely & Safely

💡 THE CODER'S MINDSET

Bugs are clues, not failures. If something doesn't work: **spot it, trace it, fix one thing**, then test again. Warm up in the **Code the Sprite** and **Teach the Robot** 3D labs on your session page while you wait for a station.

Time limit: 25 minutes · **You need:** Scratch (scratch.mit.edu or the Scratch app). Use any sprites from Scratch's library, for example the *Apple* (our mango) and the *Bowl*.

1. Your Brief

GAME BRIEF: MANGO CATCH

A mango falls from the top of the tree. The player moves a basket left and right with the **arrow keys**. Every time the basket catches the mango, the **Score** goes up by 1 and a new mango falls from the top. If the basket misses, the mango goes back to the top and falls again. When the green flag is clicked, the score must start at 0 and the basket goes to the bottom of the stage. Save it as **Scratch_MangoCatch_[YourName].sb3**.

New blocks you may need

when [right arrow] key pressed (Events): runs the blocks under it each time that key is pressed. **change x by / change y by** (Motion): moves the sprite a little sideways (x) or up and down (y); a minus number moves left or down. **pick random -200 to 200** (Operators): gives a different number each time, so the mango falls from a new place. **touching [Bowl]?** (Sensing): true when the sprite touches the Bowl. **y position** (Motion): how high the sprite is now. **<** (Operators): "less than", e.g. (y position) < (-170) means "lower than -170", the bottom of the stage.

2. Re-try Hints

Mango sprite

```
when green flag clicked
set [Score] to (0)
go to x: (0) y: (170)
forever
  change y by (-5)
  if <touching [Bowl]?> then
    change [Score] by (1)
    go to x: (pick random -200 to 200) y: (170)
  end
  if <(y position) < (-170)> then
    go to x: (pick random -200 to 200) y: (170)
  end
end
```

Basket (Bowl) sprite

```
when green flag clicked
go to x: (0) y: (-140)

when [right arrow] key pressed
change x by (15)

when [left arrow] key pressed
change x by (-15)
```

First make the variable: **Variables → Make a Variable → Score**.

3. Mentor Checklist

Check	✓
The game starts with the green flag; the Score resets to 0	☐
A loop (forever or repeat) makes the mango fall	☐
A condition (if ... then) checks whether the basket caught it	☐
A Score variable goes up by 1 for each catch	☐
The arrow keys move the basket left and right; it starts at the bottom (x: 0, y: -140)	☐
A missed mango goes back to the top and falls again	☐
Saved as Scratch_MangoCatch_[YourName].sb3	☐

A bug I found and how I fixed it:

Time taken:

Mentor initials:

🕒 Time limit
15 minutes
📁 You need

Route A: Google Sites (Hub learning account). **Route B:** Notepad and a browser, and the *MyWebPage* folder with *robot.jpg* in it. Your mentor tells you which route.

1. Your Brief
🌐 FROM THE CLUB LEADER

"Make a one-page web page called **Our Tech Club**. It needs a big heading, a short paragraph (2–3 sentences) about what we do in the club, one picture that we are allowed to use, and a link to **scratch.mit.edu** with the words *Try Scratch*. No names, faces or contact details, please."

2. Re-try Hints
📌 Route A: Google Sites

- sites.google.com → **Blank site**; name it *Our Tech Club*.
- Click the page title and type the heading. **Insert → Text box** for the paragraph.
- Insert → Images → Upload** (from *MyWebPage*).
- Select *Try Scratch*, press **Ctrl** + **K**, paste the address, **Apply**.
- Preview** 📱 on phone size, then **Publish** to the Hub only.

📌 Route B: HTML in Notepad

```
<h1>Our Tech Club</h1>
<p>...your sentences...</p>

<a href="https://scratch.mit.edu">Try Scratch</a>
```

Save as **club-page.html** in *MyWebPage* (Save as type: *All files*). Double-click it to open in the browser.

3. Mentor Checklist

Route I chose: ☐ A (Google Sites) ☐ B (HTML)

Check	✓
A big heading: <i>Our Tech Club</i>	☐
A paragraph of 2–3 sentences about the club, with no spelling mistakes	☐
One allowed picture that shows correctly (no broken-picture icon)	☐
A working <i>Try Scratch</i> link that opens scratch.mit.edu	☐
No personal details or faces	☐
A: checked in phone preview and published to the Hub only · B: saved as club-page.html and opens in a browser	☐

Time taken:
Mentor initials:

⌚ Time limit
10 minutes
📦 You need

The **Teach the Robot** 3D lab on your session page (it works offline).

1. Your Brief
🤖 THE CHALLENGE

Press **Forget everything** so the robot starts with no training data. Train it until it sorts **5 out of 5** correctly into Plastic, Paper and Cans. Use as few examples as you can. Then explain, like an AI scientist, **why** it worked.

2. Re-try Hints
1 Teach at least **2 examples of every kind**: 2 Plastic, 2 Paper and 2 Cans. One-sided data makes the robot unfair to the other kinds (Session 39).

2 Check every label before you teach it. One wrong label is **garbage in, garbage out**.

3 If it gets one wrong, look at which example it thought was most similar. Teach one more example that looks like the item it got wrong, then test again.

3. Record

Attempt	Plastic examples	Paper examples	Cans examples	Score (out of 5)
Attempt 1	-----	-----	-----	-----
Attempt 2	-----	-----	-----	-----
Attempt 3	-----	-----	-----	-----

Why did 5 out of 5 work? Use the words *training data* and *pattern*.

What would happen if you taught it 6 Plastic examples and nothing else?

Mentor check	✓
The lab shows 5 out of 5 (seen by the mentor)	☐
The explanation uses "training data" and "pattern" correctly	☐
The one-sided data answer is correct	☐

Time taken:
Mentor initials:

⌚ Time limit
15 minutes
📚 You need

A trusted source: your textbooks or the encyclopedia at the station, or a trusted website (an official *.gov.gh* site, a museum or an encyclopedia) found with a search engine.

1. Check Five AI Answers

A pupil asked a chatbot five questions. Some answers are right; some are confident mistakes ("hallucinations"). Check each one in a trusted source.

The AI said...	Right or wrong?	The correct fact	Source I used
1. "Lake Volta is a natural lake formed millions of years ago."	-----	-----	-----
2. "Water boils at 100 °C at sea level."	-----	-----	-----
3. "Saturn is the largest planet in our Solar System."	-----	-----	-----
4. "Ghana became independent on 6 March 1957."	-----	-----	-----
5. "An adult human skeleton has 32 bones."	-----	-----	-----

2. Fix a Vague Prompt with C.L.E.A.R.
💬 Vague prompt

"Tell me about food."

Rewrite it for a JHS pupil making a short class presentation about Ghanaian dishes. Include all five parts: **Context**, **Limits**, **Examples** and **details**, **Ask** one clear task, and say how you will **Review** the answer. No personal information!

How I will review (check) the answer:

Mentor check		✓
All 5 answers marked correctly, with the right facts for the wrong ones		☐
A trusted source named for each answer		☐
The prompt has all five C.L.E.A.R. parts and no personal information		☐

Time taken:
Mentor initials:

1. My Score Sheet

Station	Done	Re-try needed?	Time	Mentor initials
Typing check	☐	☐	-----	-----
1. Mango Catch Game	☐	☐	-----	-----
2. Club Web Page	☐	☐	-----	-----
3. Robot Trainer Challenge	☐	☐	-----	-----
4. AI Fact-Checker	☐	☐	-----	-----

2. Code & AI Sign-Off: Gold Passport, Part 1 🏆

The Gold Passport (Sessions 36–44) is awarded on Demo Day. Today your mentor signs off the Code & AI part.

Gold skill area	Signed off ✓
Coding: algorithms, loops, conditions, variables and debugging in Scratch (Sessions 36–37)	☐
Web building: plan, build and publish a page; basic HTML (Session 38)	☐
AI: how machines learn from examples, mistakes and bias (Session 39)	☐
Using AI wisely: C.L.E.A.R. prompts, fact-checking, privacy and honesty (Session 40)	☐
<i>Still to come on Demo Day:</i> the capstone project (Sessions 42–44) and typing at 35 wpm with 95% accuracy	–

3. My Reflection

What I'm proud of today:

What I'll practise next:

One skill from today I could use in my capstone project:

Mentor Signature: _____

Date Completed: _____