

creative learning through technology

# Digital Literacy Practice Guide

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## **Overview:**

The manual lays the foundation for understanding the importance of Digital Literacy in teaching in the modern world and its importance in the delivery of the competency-based curriculum (CBC). It provides the essential skills for educators to navigate the digital landscape effectively. Digital Literacy is one of the competencies of CBC.

The first chapter provides a fundamental introduction to computers, covering topics such as hardware, software, operating systems, and basic computer functions. It aims to familiarize readers with the essential components of a computer system and how they work together.

In the second chapter, readers are introduced to the world of coding through Scratch, a beginner-friendly programming language developed by MIT. The chapter covers the basics of Scratch programming, including creating sprites, using blocks, and building simple animations and games.

The third chapter delves into the fascinating field of artificial intelligence (AI). It provides an overview of what AI is, its applications in teaching, and the ethical considerations surrounding AI technology. Additionally,

Digital citizenship and online safety are crucial aspects of digital literacy. The manual covers aspects of internet safety, responsible online behavior, protecting personal information, and identifying online threats. It aims to empower readers to navigate the online world safely and responsibly.



## Hardware Components

Computer hardware are the physical parts of a computer.

- Keyboard
- Monitor/Screen
- CPU
- Speakers



**Keyboard:** A Keyboard is for putting information including letters, words, and numbers into your computer. You press the individual buttons on the keyboard



## Trackpad

Also known as a touchpad is used to click, scroll, zoom in and out and switch between tabs. Trackpads are commonly found on laptops and used in place of a mouse.

## Speaker

A Computer speaker is an output hardware device that connects to a computer to generate sound.

#### **Connecting to a Speaker**

Insert the device's USB connector into one of the computers' open USB ports. The device should be automatically recognized. With your laptop turned on, plug in the audio connector cable to the corresponding port on the laptop. Look on the side of the laptop for a small jack that has a drawing of headphones.

#### **COMPUTER NAVIGATION**

With a computer, navigation refers to the act of opening and moving through computer menus, like the Start menu in Windows, opening software programs, or viewing files.

#### Step 1: Open the Lid of the laptop



#### Step 2: Look for the power button



Look at your computer. Search for the button on the top-left, top-right, or on the side of the laptop. The power button is normally a small round button, and on most computers has a circle icon.

Press this button down once with firm pressure, but not too hard. Wait a few seconds for the laptop to turn on.

#### Running a program on your computer

In each case, start a program by locating its icon and clicking or double-clicking that icon. Here's where to hunt:

**The desktop:** Locate a program icon or shortcut affixed to the desktop. Double-click to open the icon and run the program.



**Taskbar:** Programs pinned to the taskbar are opened with one click. Life is easier if you keep your favorite programs on the taskbar.



The Start menu: Programs you open frequently appear atop the Start menu, on the right. Other programs are pinned as tiles on the left. Click once on the program icon or tile to run the program.

The All-Apps menu: Click the All-Apps item on the Start menu to view a list of all apps installed on your PC. Click an item to run that app. Sometimes, you must open a folder to find the app you're looking for.

#### Here is the Apps menu in Windows 10



Computer Navigation: Mouse. The four basic mouse operations are moving, clicking, double-clicking, and dragging. Moving Sliding the mouse around to change the location of the pointer. Clicking Moving the pointer onto an object and clicking the [LEFT] button once. Double-clicking Clicking the [LEFT] mouse button twice (fast). Dragging Moving the pointer onto an object, pressing the [LEFT] button,

and then moving the mouse while continuing to hold the button down.



**Finding a program when you know its name** Sometimes you know the name of the program you want to start. An easy way to locate it is to press the Win key and search in the pop-up bar For example, to run the Scratch program, press the Win key and, on the keyboard, type Scratch — that's all you need to type because Notepad Scratch appears at the top of the Start menu. Press the Enter key to launch the program.



# Connecting to the Internet

Select the Network icon on the taskbar. The icon that appears depends on your current connection state. If you don't see one of the networks icons (or a similar one) shown in the following image, select the Up arrow to see if it appears there.

You can also use a Mi-Fi device to connect to the internet. It is portable, and the connection process is the same as that of joining using Wi-Fi normally.



#### **Browsing the Internet**

The internet browser (sometimes referred to as a web browser, browser, or simply the name of the internet browser) is software that allows you to access the internet. Internet browsers are on many different kinds of electronic devices including computers, smartphones, tablets, and more. This type of software is made by many different companies, but they allow you access to the same internet. If the internet is the outside world, the internet browser is the window you are using to look outside; you can look out of many windows, but the outside world you see through them is the same.

To find the browser on your device, you will need to know which one is installed. Common web browsers include Google Chrome, Opera, Firefox, Safari, and

Microsoft Edge (sometimes just called "Edge").

The various browsers have their icons shown below:



# Chapter 2: Scratch and Coding

#### Introduction to Scratch

Scratch is a visual programming language that allows learners to create their own interactive stories, games, and animations. As the learners design their projects in Scratch, they develop the skills of thinking creatively, reasoning systematically, and working collaboratively.

https://www.uab.edu/icac/images/Scratch\_Guides/Intro\_to\_Scratch.pdf

For a tutorial of how to get started using Scratch online, you can visit this website: https://bit.ly/Scratch-Online-Start

#### Scratch Resource Guide

#### Scratch Interface: Main Interface



- 1. Code Tab: This tab displays all of the categories and blocks of code that are available for use in a project.
- 2. Costume Tab: This tab displays all of the options for sprites in the project (see diagram below).
- 3. Sounds Tab: This tab displays all of the options for sounds in the project (see diagram below).
- 4. Green Go Flag: This button can be used to make a project's code run, if the green flag event code block is used.
- 5. Red Stop Sign: This button halts all blocks of code in a project.
- 6. Code Block Categories: These are categories of code blocks available for use in the project. Clicking on a category will jump to that portion of the code block library.
- 7. Code Block Library: A list of all available blocks of code for use in a project.
- 8. Workspace: The area where code blocks are placed, dragged, and linked together. Once the blocks are in the workspace, they are a part of the project. To place a code block in the workspace, click on the block in the code block library and drag it to the workspace. To remove a code block from the workspace, it can be dragged back to any part of the code block library.

- 9. Stage: The area where the project, in its current state, can be tested, viewed, and played.
- 10. Extensions Button: Clicking this button will open the code extensions library, allowing for the importation of additional code block categories.
- 11. Sprite Options Window: When a sprite is selected, this window will allow for the sprite to be renamed, moved around the stage, change the size, change the direction, and show or hide the sprite on the stage.
- 12. Active Backdrops: This area displays the backdrop(s) that are currently in the project.
- 13. Active Sprites: This area displays the sprite(s) that are currently in the project.
- 14. New Sprite Button: Clicking this button will open the sprite library, allowing for additional sprites to be added to the project.
- 15. New Backdrop Button: Clicking this button will open the backdrop library, allowing for additional sprites to be added to the project.

Scratch Interface: Costumes Tab



- 1. Costumes: The visuals that are attached to the selected sprite.
- 2. Costume Title: The name of the selected costume.
- 3. Undo/Redo: Undo or redo the changes made to the costume.
- 4. Editing Panel: A panel of tools to edit the grouping and orientation of the selected costume.
- 5. Fill and Outline Setting: Setting options to change the color and thickness of the fill and outline of the selected costume.
- 6. Select Tool: A cursor that allows for the selection of costume elements.
- 7. Brush Tool: A tool that allows for drawing by hand on the selected costume.
- 8. Paint Bucket Tool: A tool to fill in an area of the same color within the selected costume.
- 9. Line Tool: A tool that allows for drawing straight lines on the selected costume.
- 10. Rectangle Tool: A tool that allows for drawing rectangles of any size on the selected costume.
- 11. Reshape Tool: A tool that allows for the reshaping of elements within the selected costume.
- 12. Eraser Tool: A tool to erase elements within the selected costume.
- 13. Text Tool: A tool for typing letters and numbers to be included as a part of the selected costume.
- 14. Circle Tool: A tool for drawing circles of any size within the selected costume.

## Scratch Interface: Sounds Tab



- 1. Sounds: Any sound that has been added to the project will appear listed within the panel on the left.
- 2. Name and Copy Tools: Change the name of the sound and can copy, paste, and delete parts of the sound clip.
- 3. Sound Visualization: The visualization of the sound clip is helpful when editing clips to see a visual representation of the sound.
- 4. Play Button: Preview and play the sound clip.
- 5. Playback Editing Tools: Editing tools for the way the sound will be played within the project.
- 6. New Sounds Button: Clicking this button will open up the sound library and allow for the addition of new sound clips to the project.

#### Code Blocks: Motion

Motion blocks are the set of blue blocks that handle the

movement of sprites across the screen. Sprites can move,

turn, glide, point in directions, jump to a given position,

jump to a random position, and more!



## Code Blocks: Looks

Looks blocks are the set of purple blocks that handle the visuals of the sprites on the screen. These blocks can create speech and thought bubbles, change a sprite or backdrop, change the colors and sizes of sprites and backdrops, and more!



#### Code Blocks: Sound

Sound blocks are the set of blocks that handle the sounds used in the scene. These blocks can start, stop, and change the characteristics of sounds and music used in a project!

#### Code Blocks: Events

Events blocks are the set of yellow blocks that handle the events that occur in a project. These blocks can detect when something is clicked, a keyboard key is pressed, or when a condition is met.

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# Code Blocks: Control

Control blocks are the set of orange blocks that control how the code of a project runs. These blocks can pause, repeat, and set conditions, controlling how the code of a project is carried out.

## Code Blocks: Sensing

Sensing blocks are the set of light blue blocks that detect elements within a project and are usually stored within a control block. These blocks can detect when the mouse is touching a sprite, when one kind of sprite touches a different sprite, a key is pressed on the keyboard, and more!

## Code Blocks: Operators

Operator blocks are a set of green blocks that handle mathematical and logic equations. These blocks can store, alter, and evaluate numbers and other kinds of data.



#### Code Blocks: Variables

Variable blocks are the set of dark orange blocks that manage variables used in a project. These blocks can store, set values, and change variables of any type; numbers, words, lists, etc.

## Code Blocks: Extensions

Extensions are sets of pre-made code blocks that can be added to a project's library of code blocks. When an extension is added to a project, it shows up on the left side of the menu as a new "type" of code block that is now available to be used.

# Code Blocks: My Blocks

My Blocks are a set of pink blocks that are custom written by users.

These blocks are custom written by users and can accomplish operations that are not available through the standard version of Scratch or library extensions.

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## Coding

## **Project Examples**

There are many examples of subject-specific project galleries available on the Scratch website. Just search the site. Below are but a few examples,

Projects in Science <a href="http://scratch.mit.edu/galleries/view/15003">http://scratch.mit.edu/galleries/view/15003</a>

Math Projects http://scratch.mit.edu/galleries/view/6423

Best Science (Kids) http://scratch.mit.edu/galleries/view/36449

Interactive Reading Project <u>http://scratch.mit.edu/galleries/view/61659</u>

Book Reports and Projects <a href="http://scratch.mit.edu/galleries/view/9706">http://scratch.mit.edu/galleries/view/9706</a>

Learning Languages http://scratch.mit.edu/galleries/view/60538

#### Getting Started on Scratch.

As you learned in the section on 'Introduction to Computers' above, search the application 'Scratch' and click on it.

You can learn how to make codes from the '**Tutorials**' Section As shown below:

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Follow the prompts on the Tutorials and you will create your first project!

Remember to practice!

# Chapter 3: Introduction to Artificial Intelligence (AI)

Artificial Intelligence is the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.

Large Language Models (LLMs) are a type of artificial intelligence algorithm that applies neural network techniques with lots of parameters to process and understand human languages or text using self-supervised learning techniques.

## Overview

Generative AI tools, like ChatGPT, are a subset of artificial intelligence that can create content such as text, images, video, audio, code, or synthetic data. These tools are also known as Large Language Models or LLMs.

LLMs are trained on huge amounts of text data and work by taking the input text and repeatedly predicting the next token or word. It is important to remember that LLMs like ChatGPT are **not** as powerful as our human minds and can make mistakes or provide inaccurate information.

ChatGPT and other tools also have biases in their output. This is because these tools were trained on using text data from the internet, some of which reflect the biases, prejudices, and stereotypes within the broader world. This data also relies heavily on sources from America and Europe, which means the content might be less relevant or useful for people in countries like Kenya.

Because of this, educators must exercise caution when using generative AI tools in teaching. These tools can help educators reduce their prep time, build their own subject knowledge, and enhance the quantity and quality of their feedback to students – but educators should always make sure to review and edit the content generated by the tool before using it in the classroom.

For more information on this topic, review or explore one of these free courses/sites:

- <u>Code.org | Al 101 for Teachers</u>
- Open Al | Teaching with Al
- Team4Tech | Intro to Al

# Using generative AI for lesson planning

While technology can never replace the expertise of a real live teacher, it can make the very difficult job of a teacher a bit easier. Lesson planning is one example of this. Using ChatGPT or other generative AI tools for lesson planning is very similar to using Google to find lesson plan examples that you can modify. You always want to make sure that you are thinking about the needs of your classroom and your students – and that you adapt the lesson to meet those needs. You should also make sure that you understand your school's policy around the use of generative AI and that you comply with any rules that your administration has set. You should **never enter personal identifying information** about your students or yourself into a generative AI tool.

#### **Creating your prompt**

To start with it, open an AI chat tool. You can use <u>ChatGPT</u> or <u>Claude</u>. You then want to put in a prompt that requests a lesson plan for your designated class session. Here is an example of a prompt that is put in the chat box?:

"I am a Grade 3 instructor teaching 30 children in a school in Kilifi County in coastal Kenya . Our class term started four months ago, and I am currently covering the science of magnets. As a pedagogy expert with years of teaching experience, I would like you to provide lesson planning guidance to me that is grounded in the latest science of learning, Universal Design for Learning principles, and the use of play and creativity in learning. This week's learning objective is that students should be able to ask questions to determine cause-and-effect relationships of electric or magnetic interactions between two objects not in contact with each other. Students have already learned about the scientific method and cause-and-effect in previous lessons. For this 30-minute lesson, I have available to me one blackboard and a set of magnets to use for demonstrations. I want my lessons to include direct instruction, checking for understanding (including gathering evidence of understanding from a wide sampling of students), discussion, an engaging in-class activity, and an assignment. Can you give me a proposed lesson plan?"

You can modify a prompt like this one to suit your needs. Here are the building blocks to include, along with an example of how this building block was covered in the sample prompt:

Provide an overview of you and your class (but, do not share identifying information!)	I am a Grade 3 instructor teaching 30 children in a school in Kwale County in coastal Kenva. Our class term started four
	months ago, and I am currently covering the science of magnets.
Establish a role and pedagogical approach for the chatbot	As a pedagogy expert with years of teaching experience, I would like you to provide lesson planning guidance to me that is grounded in the latest science of learning, Universal Design for Learning principles, and the use of play and creativity in learning.
List the topic, learning objectives, and/or academic standards for your lesson – including any useful info about what students have already learned	This week's learning objective is that students should be able to ask questions to determine cause-and-effect relationships of electric or magnetic interactions between two objects not in contact with each other. Students have already learned about the scientific method and cause-and-effect in previous lessons.
Indicate what resources you have available to you – including time and physical resources	For this 30-minute lesson, I have available to me one blackboard and a set of magnets to use for demonstrations.
Set expectations for what you want the tool to provide – i.e. a lesson plan – and what types of activities it should include	I want my lessons to include direct instruction, checking for understanding (including gathering evidence of understanding from a wide sampling of students), discussion, an engaging in-class activity, and an assignment. Can you give me a proposed lesson plan?"

Feel free to use the blank version of this table at the end of this document as you craft your own prompts.

# Getting and refining your answers

Once you have your prompt, paste it into <u>ChatGPT</u> or <u>Claude</u> and hit "Send message" to get your response. The system may take a few minutes to generate your lesson plan. Here's <u>an example from my ChatGPT</u>. Once you have the lesson plan, review it fully. You may want to copy the plan into Microsoft Word to make edits or make notes about any changes using a notebook.

You can also ask questions within the same conversation to generate better or more robust answers. For example, generative AI lesson plans tend to be unrealistic with time management. You might ask the tool to cut back on some activities and make other activities longer. You know your classroom best so trust your instincts as to how long the activities will last.

You may also want to get more information about a certain activity. For example, my lesson plan said "Ask a few open-ended questions to the whole class to assess their understanding of cause-and-effect in magnetism." I asked ChatGPT to give me some recommendations for questions to ask. You can see that interaction below:

**Prompt:** "I am a Grade 3 instructor teaching 30 children in a school district in coastal Kenya. Our class term started four months ago, and I am currently covering the science of magnets. As a pedagogy expert with years of teaching experience, I would like you to provide lesson planning guidance to me that is grounded in the latest science of learning, Universal Design for Learning principles, and the use of play and creativity in learning. This week's learning objective is that students

should be able to ask questions to determine cause-and-effect relationships of electric or magnetic interactions between two objects not in contact with each other. Students have already learned about the scientific method and cause-and-effect in previous lessons. For this 30-minute lesson, I have available to me one blackboard and a set of magnets to use for demonstrations. I want my lessons to include direct instruction, checking for understanding (including gathering evidence of understanding from a wide sampling of students), discussion, an engaging in-class activity, and an assignment. Can you give me a proposed lesson plan?"

# Grade 3 Science Lesson Plan: Exploring Magnets

Learning Objective: Students will be able to ask questions to determine cause-and-effect relationships of electric or magnetic interactions between two objects not in contact with each other.

## Materials Needed:

- Set of magnets
- Blackboard and chalk

# Lesson Duration: 30 minutes

# Lesson Plan:

- 1. Opening (5 minutes):
  - Greet the students and briefly review what they have learned about magnets so far.
  - Introduce the day's learning objective: asking questions to determine cause-and-effect relationships of electric or magnetic interactions between objects not in contact.
- 2. Direct Instruction (5 minutes):
  - Explain the concept of cause-and-effect in the context of magnetism. Use simple examples and relate them to everyday experiences.

# 3. Checking for Understanding (5 minutes):

- Ask a few open-ended questions to the whole class to assess their understanding of cause-and-effect in magnetism.
- Use the blackboard to illustrate their responses and correct any misconceptions.

# 4. Engaging Activity (10 minutes):

- Divide the class into small groups and provide each group with a set of magnets.
- Instruct students to explore how different objects (paper clips, coins, etc.) interact with the magnets without touching them.
- Encourage them to ask questions about why certain objects are attracted or repelled by the magnets.

# 5. Discussion (5 minutes):

- Bring the class back together and have each group share their observations and questions.
- Facilitate a discussion on the cause-and-effect relationships they observed, guiding them to think about the role of magnetism in everyday objects.

# 6. Assignment (5 minutes):

- Assign a simple take-home task that reinforces the concept, such as asking students to find and bring to class an object that is attracted to a magnet and explain why they think it is attracted.
- 7. Closure (5 minutes):
  - Summarize the key points of the lesson and emphasize the importance of asking questions to understand how things work.
  - Preview the next lesson on magnets or another topic related to science.

#### Additional Tips:

- Encourage students to use their creativity in thinking about the interactions of magnets.
- Provide opportunities for students to share their findings and questions with the class to promote a collaborative learning environment.
- Use the blackboard effectively to visually represent concepts and student responses.

This lesson plan is designed to engage students in active learning, foster curiosity, and develop their ability to ask questions and think critically about the science of magnets.

# Prompt

This is great. Can you provide some questions to ask for the section: "Ask a few open-ended questions to the whole class to assess their understanding of causeand-effect in magnetism."

Certainly! Here are some open-ended questions you can ask the class:

- 1. What happens when you bring two magnets close together? Why do you think this happens?
- 2. Can you think of any objects around us that are attracted to magnets? Why do you think they are attracted?
- 3. How does the distance between two magnets affect the strength of the attraction or repulsion?
- 4. Have you ever seen or experienced magnets being used in real life? What was their purpose?
- 5. What do you think would happen if you cut a magnet into two pieces? Why?
- 6. How do you think magnets help us in our daily lives? Can you give some examples?
- 7. Do you think all materials are affected by magnets in the same way? Why or why not?
- 8. Why do you think some magnets are stronger than others? What factors might affect the strength of a magnet?

These questions are designed to prompt students to think critically about the concepts of magnetism and cause-and-effect relationships, encouraging them to articulate their understanding and reasoning.

Other areas where you might want to ask questions to build a better lesson plan are around anticipated areas that students struggle with, possibilities for differentiation, and examples to help make the content relatable to students. Ask those questions in the same chat thread as your first prompt to ensure that the answers are consistent.

#### Next steps

The best way to build knowledge about generative AI is to experiment with it, **as long as you do so safely.** Always remember that these tools can make mistakes and that there is the risk for bias and misinformation. **Never enter personal identifying information into a generative AI tool**. Remember that you are the expert and the only one who really understands the needs of your classroom, students, and curriculum.

With that in mind, the great thing about these tools is that you can continue to modify your prompts as time goes on to get better answers. If you have prompts that work well, do share them with each other! Feel free to reach out to your KPLAY team if you have any questions or comments.

#### **Exercise:**

Building Block	Prompt Text
Provide an overview of you and your class	
(but, do not share identifying information!)	
Establish a role and pedagogical approach	
for the chatbot	
List the topic, learning objectives, and/or	
academic standards for your lesson –	
including any useful info about what	
students have already learned	
Indicate what resources you have available	
to you – including time and physical	
resources	
Set expectations for what you want the tool	
to provide – i.e. a lesson plan – and what	
types of activities it should include	

#### Lesson Plan Prompt Template