



[D4.1 Digital Literacy Curriculum]

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ABSTRACT

D4.1 Digital Literacy Curriculum supports teachers and hobby activity organizers in Europe to cultivate students' critical, creative and safe use of technology. It aligns with UNESCO ICT & AI Competency Frameworks, the Digital Competence Framework for European Schools, and the Global Digital Literacy 4.4.2 framework, ensuring coherence across school and informal learning. The curriculum provides modular activities, age-appropriate progression, and inclusive guidance.

KEYWORDS

Digital Literacy, Digital Citizenship, Digital Skills, Digital Competency.

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List of Abbreviations and Acronyms

CA	Consortium Agreement
D	Deliverable
DoA	Description of the Action
GA	EU Grant Agreement
PC	Project Coordinator
PCO	Project Coordination Office
TL	Task Leader
SO	Specific objective
WP	Work Package

Executive Summary

The Digital Literacy Curriculum equips teachers and hobby activity organizers across Europe to help young people – and the wider community – use technology critically, creatively, and safely. It combines clear learning pathways (primary to upper secondary) with modular activities that fit regular classes, clubs, and multidisciplinary projects. Core areas include information and media literacy, online safety and wellbeing, digital citizenship, collaboration, coding and data basics, and emerging AI awareness. The curriculum aligns with UNESCO ICT (UNESCO, 2018; UNESCO, 2022a) and AI Competency Framework (UNESCO, 2021; UNESCO, 2022b), European Framework for Digital Competence (European Schoolnet, 2020; Redecker, 2017; Vuorikari et al., 2016) and the Global Framework for Digital Literacy (SDG 4.4.2), UNESCO Institute for Statistics, 2018. Practical supports – lesson plans, inclusive design guidance, rubrics, and teacher training – enable easy adoption in diverse contexts, including low-resource settings. We are actively researching how to integrate AI tools and competencies responsibly in the next version of the curriculum to reduce divides and boost participation.



Introduction

This Digital Literacy Curriculum is designed to support schoolteachers and hobby activity organizers in introducing young students to essential digital skills and helping them develop a deeper understanding of the technologies shaping our world. It can be flexibly integrated into teaching activities, multidisciplinary studies, and extracurricular programs to promote digital literacy among students and citizens across Europe.

The curriculum has been developed with reference to internationally recognized standards, including:

UNESCO ICT Competency Framework for Teachers (UNESCO, 2018)

UNESCO digital literacy competencies assessment (UNESCO, 2022a)

UNESCO AI Competency Framework for Teachers (UNESCO, 2021)

UNESCO AI Competency Framework for Students (UNESCO, 2022b)

Digital Competence Framework for the European Schools (European Schoolnet, 2020)

European Framework for the Digital Competence of Citizens (Vuorikari et al., 2016)

European Framework for the Digital Competence of Educators (Redecker, 2017)

A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 (UNESCO Institute for Statistics, 2018)

Creative Computing Curriculum (2014), developed by the Creative Computing Lab at Harvard Graduate School of Education.

Recognising the rapid advancement of artificial intelligence technologies, ongoing research is exploring how AI components can be meaningfully integrated into future iterations of the curriculum. The programme will be adjusted and refined during piloting. It will also be translated into Latvian, Ukrainian, and Russian prior to piloting, with further translations to follow as needed.

1. Digital Citizenship Curriculum

1.1 Primary School Digital Citizenship Curriculum (Ages 7–12)

Duration: 15 weeks

Module	Learning Objectives	Assessment
1. Digital World Foundations	- Define digital citizenship and online/offline spaces - Identify common devices and classroom tech rules	- Poster: “Tech Promise” with three rules - Quiz: label online vs. offline activities
2. Privacy & Personal Data	- Recognize types of personal information - Create strong passwords - Practice asking permission to share data	- Worksheet: sort “public” vs. “private” info - Password-strength race judged by checklist
3. Digital Footprints & Identity	- Explain that online actions leave traces - Craft a positive online identity	- Sketch: “My Positive Post” with caption - Journal: three ways you want to be seen online
4. Respectful Communication	- Use kind language and netiquette - Recognize cyberbullying signs and reporting channels	- Role-play: rewriting rude messages into polite ones - Badge: “Be Kind Online” awarded by peer vote
5. Creative & Copyright Basics	- Understand ownership of digital creations - Give proper credit using simple attribution	- Matching game: image → correct credit line - Create and sign an original artwork with CC awareness
6. Information Literacy	- Distinguish fact vs. opinion - Identify trustworthy kid-friendly sources	- Scavenger hunt: find one fact online and cite its source - Sorting cards: fact / opinion / ad
7. Digital Well-Being	- Track and balance screen time - Practice healthy break habits	- Screen-time log for one day - Lead a 2-minute stretch break; peer feedback
8. Cyberbullying Prevention	- Define cyberbullying roles (bystander, target) - Demonstrate blocking/reporting actions	- Scenario quiz: choose correct action when confronted with bullying “I Matter” support banner creation

9. Collaboration & Creativity	• Use shared docs/slides respectfully • Comment and restore version history	• Paired slide deck: add content & comments • Teacher checks version-history rollback ability
10. Careers & Rights	• Explore tech-based jobs • Identify basic digital rights (expression, privacy)	• “Tech Dream” collage presented to class • Rights vs. responsibilities T-chart
11. Emerging Tech Safety	• Recognize VR/voice assistant risks • Apply age-appropriate usage rules	• Checklist: adjust voice-assistant privacy settings • Demo safe VR use with guided reflection
12. Capstone Showcase	• Integrate all pillars into a final mini-project • Present and reflect on learning	• Multimedia poster & 2-min presentation • Self-assessment: tick mastered objectives

Week 1: Welcome to the Digital World

Objectives:

- Understand what “digital citizenship” means
- Identify devices and online environments
- Learn basic classroom technology rules

Learning Outcomes:

1. Students can define “digital citizenship” in their own words and list two examples of responsible online behaviour.
2. Students can name at least three devices (e.g. tablet, laptop, smartphone) and two online environments (e.g. educational website, video call).
3. Students can recite and follow three classroom rules for technology use (e.g. raise hand before using device, stay on task, use polite language).

Topics:

- Definition of digital citizenship
- Devices: tablets, computers, cameras
- Classroom tech etiquette

Hands-on Activities:

- Tour of classroom devices

- Group discussion: “What is online?”
- Create a “Tech Promise” poster

Weekly Assignments:

1. Draw and label your favourite device.
2. Write five rules for using a tablet safely.
3. Practice turning a device on/off correctly.
4. Role-play polite computer sharing.
5. Share one way to ask for help when stuck.

Week 2: Online vs. Offline Worlds**Objectives:**

- Recognize differences between online and offline interactions
- Identify safe vs. unsafe scenarios
- Practice asking permission

Learning Outcomes:

1. Students can compare two scenarios (one online, one offline) and explain how interactions differ (e.g. face-to-face tone vs. text tone).
2. Students can spot three unsafe situations online (e.g. talking to strangers, oversharing personal info, clicking unknown links).
3. Students can demonstrate how to ask permission before sharing photos or personal details online by role-playing at least two examples.

Topics:

- Public vs. private spaces
- Personal vs. shared data
- Asking permission online

Hands-on Activities:

- Sort “online” vs. “offline” actions cards
- Group role-play: asking to post a photo
- Draw your personal “Privacy Bubble”

Weekly Assignments:

1. List three things you would share offline only.
2. Circle three things safe to share online.
3. Practice asking a partner before posting.
4. Create a “Privacy Bubble” art piece.
5. Share in class one thing you keep private.

Week 3: Digital Footprints & Identity**Objectives:**

- Define digital footprint
- Understand that actions leave traces
- Reflect on positive online identity

Learning Outcomes:

1. Students can explain “digital footprint” and give two personal examples of traces left online (e.g. comments, uploads).
2. Students can trace the path of a shared image or post and describe who might see it.
3. Students can list three ways to build a positive online identity (e.g. posting kind comments, choosing appropriate avatars, thinking before sharing).

Topics:

- What is a digital footprint?
- Examples of positive/negative posts
- Keeping track of online actions

Hands-on Activities:

- Trace footprints on paper to represent posts
- Group brainstorm: “Good digital footprints”
- Create a “My Positive Post” sketch

Weekly Assignments:

1. Write a positive comment you could post.
2. List two things you wouldn’t share online.

3. Draw footprints showing safe choices.
4. Role-play deleting an unwanted post.
5. Reflect: how do you want to be seen online?

Week 4: Privacy & Personal Information

Objectives:

- Identify personal information types
- Learn to protect personal data
- Practice safe password habits

Learning Outcomes:

1. Students can categorize five pieces of information as “personal” (e.g. full name, address, birthday) versus “public” (e.g. favourite colour).
2. Students can create a strong password following guidelines (minimum eight characters, mix of letters/numbers).
3. Students can role-play refusing to share a password or personal detail and suggest an alternative safe response.

Topics:

- Name, age, address, phone number
- Password strength basics
- Stranger danger online

Hands-on Activities:

- Sort “personal” vs. “public” info cards
- Create a “Strong Password” recipe poster
- Password-creating race with safe criteria

Weekly Assignments:

1. Generate three sample strong passwords.
2. Circle personal info you wouldn’t share.
3. Practice hiding info in a mock form.

4. Draw a “no sharing” shield.
5. Teach a family member one password tip.

Week 5: Respectful Communication

Objectives:

- Practice kind online language
- Understand tone and intent
- Recognize and prevent cyberbullying

Learning Outcomes:

1. Students can rewrite a harsh or ambiguous message into a kind, clear statement using “I” language.
2. Students can demonstrate how punctuation and emoji can change tone (e.g. “Thanks.” vs. “Thanks!”).
3. Students can identify at least two examples of cyberbullying in given scenarios and suggest appropriate interventions (report/block).

Topics:

- Netiquette and “tone” in texts
- Recognizing mean vs. kind messages
- Reporting hurtful behaviour

Hands-on Activities:

- Emoji tone-matching game
- Rewrite unkind messages into kind ones
- Role-play reporting a hurtful comment

Weekly Assignments:

1. Transform a rude message into a polite one.
2. Identify three positive emojis you’d use.
3. Create a “Be Kind Online” badge.
4. List two people you’d tell if upset online.
5. Share a compliment in the class chat.

Week 6: Copyright & Creative Sharing

Objectives:

- Learn about ownership of digital work
- Practice giving credit
- Explore Creative Commons basics

Learning Outcomes:

1. Students can distinguish between “mine” and “ours” in digital creations and explain why credit matters.
2. Students can demonstrate proper attribution by writing a credit line for an image or song.
3. Students can match three Creative Commons license icons to their permissions (e.g. re-use, remix, non-commercial).

Topics:

- What is copyright?
- Attribution and crediting
- Safe image and music sources

Hands-on Activities:

- “Who made this?” matching game
- Create an artwork and credit a friend
- Explore and pick CC-licensed images

Weekly Assignments:

1. Draw and sign an original picture.
2. Find one CC image and list its author.
3. Write a sentence giving credit.
4. Role-play asking permission to use art.
5. Share credited image link responsibly.

Week 7: Information Literacy Basics

Objectives:

- Distinguish fact vs. opinion
- Identify trustworthy sources
- Practice simple online searches

Learning Outcomes:

1. Students can label five sample statements as fact or opinion and justify their choices.
2. Students can evaluate a website's trustworthiness by checking author, date, and ".edu/.gov" domains.
3. Students can perform a basic keyword search and pick the top two relevant results for a child-friendly topic.

Topics:

- Facts, opinions, and ads
- Reliable websites vs. ads
- Basic search strategies

Hands-on Activities:

- Sort statements into fact/opinion piles
- Visit a kid-friendly search site
- Find one picture of a known animal online

Weekly Assignments:

1. Find one fact about your favourite animal.
2. Identify one opinion sentence in a story.
3. Draw a "Good site" vs. "Ad" icon.
4. Practice quoting a source correctly.
5. Share your found facts in class.

Week 8: Digital Well-Being & Screen Time**Objectives:**

- Understand healthy screen habits
- Recognize signs of too much screen use
- Plan balanced activities

Learning Outcomes:

1. Students can list three healthy screen habits (e.g. 20-20-20 rule, breaks every hour).
2. Students can identify physical or emotional signs of overuse (e.g. tired eyes, irritability).
3. Students can create a one-day schedule balancing screen time with offline activities (play, reading, exercise).

Topics:

- Screen time guidelines
- Taking breaks and stretching
- Balancing online/offline play

Hands-on Activities:

- Track own daily screen time chart
- Lead a 2-minute stretch break
- Create a “Balanced Day” poster

Weekly Assignments:

1. Record today’s screen time in minutes.
2. List three offline fun activities.
3. Remind a friend to take a screen break.
4. Design a 5-minute break routine.
5. Share one way you balance screen time.

Week 9: Cyberbullying Prevention**Objectives:**

- Define cyberbullying
- Learn strategies to respond safely
- Practice reporting and blocking

Learning Outcomes:

1. Students can write a clear definition of cyberbullying and give two real-life examples.
2. Students can roleplay a safe response to being bullied online (e.g. stop, screenshot, tell a trusted adult).

3. Students can demonstrate how to use platform tools to report or block a user in a simulated environment.

Topics:

- Types of cyberbullying
- Block/report tools basics
- Support peers in need

Hands-on Activities:

- Read and discuss a short cyberbully story
- Role-play blocking/reporting a bully
- Create an “I matter” support banner

Weekly Assignments:

1. List three examples of cyberbullying.
2. Practice clicking “block” on a mock profile.
3. Write a supportive message to a peer.
4. Draw a “safe space” online icon.
5. Share one place you can seek help.

Week 10: Digital Footprint Reflection**Objectives:**

- Review own digital actions so far
- Understand long-term impact of posts
- Plan positive online presence

Learning Outcomes:

1. Students can review a mock “digital timeline” of their activities and identify at least two positive and two risky posts.
2. Students can explain how one past post might be seen by future teachers or peers.
3. Students can draft a personal “online presence plan” with three commitments (e.g. think before posting, share only kind content).

Topics:

- Tracing posts over time
- Reputation management basics
- Updating privacy settings

Hands-on Activities:

- Create a timeline of your imaginary posts
- Adjust mock privacy settings in a demo
- Plan three “good posts” for next month

Weekly Assignments:

1. Sketch your digital timeline with footprints.
2. Change at least one privacy setting at home.
3. Write three positive things to share next week.
4. Role-play deleting an old post.
5. Reflect in journal: “My best digital self.”

Week 11: Online Collaboration & Creativity**Objectives:**

- Use collaborative tools safely
- Share ideas respectfully
- Co-create a simple digital project

Learning Outcomes:

1. Students can log into a shared document or slideshow and add one comment or drawing without overwriting others.
2. Students can practice “active listening” by summarizing a peer’s idea before adding their own.
3. In pairs, students can build a simple shared poster (text + image) on a digital whiteboard.

Topics:

- Shared documents and slides
- Commenting and version history

- Respecting collaborator rights

Hands-on Activities:

- Work in pairs on a shared slide
- Use comments to give feedback
- Restore a previous slide version

Weekly Assignments:

1. Add your idea to a shared slide.
2. Comment kindly on a peer's slide.
3. Roll back a change in version history.
4. Draw a “teamwork” digital badge.
5. Reflect: what makes good collaboration?

Week 12: Exploring Digital Careers**Objectives:**

- Discover jobs that use technology
- Match skills to roles
- Encourage future aspirations

Learning Outcomes:

1. Students can list at least five digital careers (e.g. coder, designer, data analyst) and one key skill each requires.
2. Students can match their own strengths/interests to two potential tech roles.
3. Students can draft a short “career snapshot” slide describing a chosen job's tasks and tools.

Topics:

- Examples: coder, designer, teacher
- Skills: creativity, problem-solving
- Pathways: learning and practice

Hands-on Activities:

- Guest chat (virtual) with a digital professional

- Research one tech job and share facts
- Create a “My Tech Dream” collage

Weekly Assignments:

1. List three tech jobs you find interesting.
2. Draw tools a coder uses.
3. Write one skill you want to learn.
4. Share your “Tech Dream” collage.
5. Reflect on why that job appeals to you.

Week 13: Digital Rights & Responsibilities**Objectives:**

- Identify rights online (expression, privacy)
- Understand responsibilities (respect, safety)
- Discuss fair use

Learning Outcomes:

1. Students can name two online rights (e.g. free expression, data privacy) and two corresponding responsibilities.
2. Students can explain “fair use” with an example of how to legally reuse an image or video.
3. Students can role-play resolving a rights vs. responsibility conflict (e.g. sharing vs. privacy).

Topics:

- Freedom of speech basics
- Respecting others’ rights
- Fair use for education

Hands-on Activities:

- Role-play respectful debate online
- Create a “Digital Rights” frame
- Sort scenarios into rights vs. responsibilities

Weekly Assignments:

1. List two online rights you have.
2. List two responsibilities you hold.
3. Draw “fair use” vs. “infringement” icons.
4. Role-play asking permission to reuse.
5. Reflect in journal: “My digital pledge.”

Week 14: Emerging Technologies & Safety**Objectives:**

- Explore new tools (VR, voice assistants)
- Identify potential risks
- Practice safe use guidelines

Learning Outcomes:

1. Students can describe one emerging technology (e.g. VR headset) and list two possible uses.
2. Students can identify at least two safety concerns (e.g. privacy, screen time) related to that technology.
3. Students can draft three “safe use” rules for new tools (e.g. supervised use, volume limits).

Topics:

- Virtual reality, AI assistants, games
- Safety goggles, privacy with voice data
- Age-appropriate content

Hands-on Activities:

- Demo a safe VR-style game
- Practice voice assistant privacy settings
- Create a “Tech Safety” checklist

Weekly Assignments:

1. Describe one new technology you tried.

2. List one safety rule for that tech.
3. Check privacy settings on a voice assistant.
4. Share your “Tech Safety” checklist.
5. Reflect: “How will I stay safe?”

Week 15: Final Showcase & Reflection

Objectives:

- Integrate all learned concepts
- Present personal digital citizenship plan
- Set goals for ongoing practice

Learning Outcomes:

1. Students can deliver a 3-minute presentation outlining their top five digital citizenship takeaways.
2. Students can share their personal digital citizenship plan (from Week 10) and explain two revisions based on new learning.
3. Students can set three SMART goals for maintaining positive online habits over the next school year.

Topics:

- Review of key themes
- Sharing best practices
- Goal setting and next steps

Hands-on Activities:

- Prepare a digital poster summarizing learnings
- Present your “Digital Promise” to class
- Peer feedback and celebration

Weekly Assignments:

1. Create a “Digital Promise” poster.
2. Present your promise and explain it.
3. Give feedback to two classmates.

4. Write three personal goals for digital life.
5. Reflect in journal: “My growth in digital citizenship.”

1.2 Middle School Digital Citizenship Curriculum (Ages 11–15)

Duration: 15 weeks

Module	Learning Objectives	Assessment
1. Self-Audit & Habits	• Conduct a personal digital habits audit • Set improvement goals	• Audit report with two habits to change • SMART goal sheet reviewed by teacher
2. Privacy & Security	• Master password managers & 2FA • Detect phishing and scams	• Phishing email quiz (identify red flags) • Setup demo 2FA & submit screenshot
3. Footprint & Reputation	• Google-audit your online presence • Update privacy settings on social platforms	• Before/after privacy settings log • 50-word professional bio evaluated for clarity
4. Cyberbullying & Empathy	• Analyse impacts of cyberbullying • Practice digital empathy and bystander intervention	• Empathy map for a target’s perspective • Support-message template reviewed against rubric
5. Media Literacy & Fact-Check	• Evaluate source credibility • Detect bias, satire, clickbait	• News-article analysis worksheet • Fact-check one viral claim and cite sources
6. Data Ethics & Consent	• Explain how cookies/trackers work • Draft informed consent for data collection	• Browser cookie inspection exercise • Class “Data Consent” form peer-reviewed
7. Creative Commons & Licensing	• Apply appropriate CC licenses to work • Attribute third-party content	• Licensing choice justification • Attribution of a CC image in a mini-project evaluated for completeness
8. Collaboration & Versioning	• Use Google Workspace/Microsoft 365 collaboratively • Commit & restore versions via GitHub Classroom	• Shared doc project with tracked comments • GitHub Classroom: commit history, revert a change

9. Cybersecurity Fundamentals	• Identify malware, social engineering tactics • Perform secure backups and updates	• Malware identification quiz • Mock backup to cloud storage and submit log
10. Digital Wellness & Mindfulness	• Implement digital detox strategies • Configure Do-Not-Disturb and focus modes	• Detox plan with reflection log • Screenshot of device focus settings with peer-verified run
11. Emerging Tech Ethics	• Debate AI/AR/VR ethical concerns • Draft safe-use guidelines for new technologies	• Group mini-debate judged by rubric • “Safe Tech” guideline poster reviewed for clarity and completeness
12. Rights & Advocacy	• Research youth digital rights movements • Craft persuasive digital policy proposals	• One-page policy brief • 140-char advocacy tweet peer-evaluated
13. Portfolio & Branding	• Build an online showcase (GitHub Pages, Behance) • Apply visual branding principles	• Published portfolio page checklist • Peer feedback on logo/brand consistency
14. Peer Teaching & Mentoring	• Design lesson plans for younger learners • Facilitate digital-citizenship workshop	• Lesson-plan rubric • Teaching observation feedback
15. Capstone Project	• Plan, develop & present a comprehensive digital-citizenship resource	• Final resource judged on accuracy, engagement & usability • Reflective summary of learning

Week 1: Digital Citizenship Deep Dive

Objectives:

- Revisit core concepts at a deeper level
- Self-assess current digital habits
- Establish group norms

Learning Outcomes:

1. Students can articulate the four pillars of digital citizenship (e.g. etiquette, literacy) and provide examples.
2. Students can complete a personal digital habits survey and identify one strength and one area for improvement.

3. As a class, students can co-create and agree on five group norms for online collaboration.

Topics:

- Review privacy, footprint, etiquette
- Personal digital habits audit
- Classroom norms contract

Hands-on Activities:

- Complete a digital habits checklist
- Group negotiation of class norms
- Design a digital citizenship code banner

Weekly Assignments:

1. Audit your past week's online activity.
2. Identify two habits to improve.
3. Share audit results with a partner.
4. Draft three norms for safe online class.
5. Display the norms as a poster.

Week 2: Privacy & Security Essentials**Objectives:**

- Master strong password strategies
- Understand two-factor authentication (2FA)
- Recognize phishing and scams

Learning Outcomes:

1. Students can generate and store a complex password using a password manager or secure method.
2. Students can explain how 2FA works and set it up on a mock account.
3. Students can identify three phishing indicators (e.g. misspelled URLs, urgent tone) in sample emails.

Topics:

- Password managers overview
- 2FA methods: SMS, apps, keys
- Phishing email/red flag detection

Hands-on Activities:

- Set up a password manager demo
- Walk through a mock 2FA setup
- Analyse sample phishing emails

Weekly Assignments:

1. Create and store five complex passwords.
2. Enable 2FA on a demo account.
3. Identify three phishing clues in examples.
4. Write a guide: “How to spot scams.”
5. Share your guide with a peer.

Week 3: Digital Footprint & Reputation**Objectives:**

- Audit personal online presence
- Manage and update privacy settings
- Build a positive digital brand

Learning Outcomes:

1. Students can conduct an account-audit checklist (profile photo, bio, posts) and note three changes needed.
2. Students can adjust privacy settings on a sample social profile to restrict visibility.
3. Students can craft a professional bio headline and select an appropriate profile image.

Topics:

- Google yourself responsibly
- Privacy settings on social platforms
- Personal branding basics

Hands-on Activities:

- Review your own (or mock) social profile settings
- Draft a professional bio for a student site
- Practice “right to be forgotten” concepts

Weekly Assignments:

1. List five items that appear when you search your name.
2. Update three privacy settings on a real/demo account.
3. Write a concise 50-word bio.
4. Delete or hide one old post.
5. Reflect: “What do I want others to see?”

Week 4: Cyberbullying & Digital Empathy**Objectives:**

- Examine impacts of cyberbullying
- Develop strategies for intervention
- Cultivate digital empathy
-

Learning Outcomes:

1. Students can summarize the emotional effects of cyberbullying using a real-world case study.
2. Students can role-play intervening as a bystander (supporting the target, reporting).
3. Students can demonstrate empathetic responses by writing a supportive message to a peer in distress.

Topics:

- Bystander, target, and bully roles
- Empathy exercises online
- Reporting tools and policies

Hands-on Activities:

- Case-study discussion of a cyberbullying event
- Empathy mapping for online users

- Draft a supportive message template

Weekly Assignments:

1. Role-play as a bystander: what would you do?
2. Complete an empathy map for a peer.
3. Write a message to support someone upset online.
4. List reporting steps on one platform.
5. Share your message template with the class.

Week 5: Information & Media Literacy**Objectives:**

- Critically evaluate online information
- Detect bias, satire, and clickbait
- Practice fact-checking

Learning Outcomes:

1. Students can apply a “CRAAP” checklist (Currency, Relevance, Authority, Accuracy, Purpose) to a news article.
2. Students can distinguish satirical headlines from real news in a mixed set of five examples.
3. Students can verify a claim by cross-checking two reputable sources and documenting the process.

Topics:

- Source credibility criteria
- Bias, opinion, and satire identification
- Fact-checking tools and techniques

Hands-on Activities:

- Compare two articles on same topic
- Identify bias language in headlines
- Use fact-check sites to verify a claim

Weekly Assignments:

1. Evaluate credibility of a news source.
2. Spot bias in a short paragraph.
3. Find a satirical article and identify cues.
4. Verify one viral claim with fact-check sites.
5. Create a “Checklist for Reliable News.”

Week 6: Privacy, Data & Digital Rights

Objectives:

- Understand how data is collected and used
- Learn about cookies and trackers
- Explore digital rights and responsibilities

Learning Outcomes:

1. Students can diagram the flow of personal data from a website to advertisers.
2. Students can identify cookie-consent options and explain the implications of each choice.
3. Students can draft a mini-charter listing three key digital rights and matching responsibilities.

Topics:

- Cookies, tracking, and data brokers
- GDPR/CCPA basics for youth
- Ethical data use

Hands-on Activities:

- Inspect cookies in a browser demo
- Opt-out of a demo ad tracker
- Debate data collection trade-offs

Weekly Assignments:

1. List three ways websites track you.
2. Clear cookies and observe changes.

3. Draft a privacy policy for a class blog.
4. Write a “data rights” poster.
5. Reflect: “When is data collection okay?”

Week 7: Digital Footprint & Career Exploration

Objectives:

- Link digital presence to future opportunities
- Research digital portfolios
- Develop an online showcase plan

Learning Outcomes:

1. Students can cite two examples of professionals whose portfolios advanced their careers.
2. Students can evaluate three portfolio platforms (e.g. GitHub Pages, Behance) for suitability.
3. Students can outline their own portfolio structure with at least three project entries.

Topics:

- Portfolios, LinkedIn basics for teens
- Showcasing school projects safely
- Netiquette for professional settings

Hands-on Activities:

- Create a sample digital portfolio outline
- Peer-review a mock LinkedIn profile
- Plan two portfolio projects

Weekly Assignments:

1. Draft three portfolio project descriptions.
2. Peer-review a classmate’s mock profile.
3. Collect images/work samples for showcase.
4. Write a professional introduction paragraph.

5. Share your outline in the class forum.

Week 8: Creative Commons & Licensing

Objectives:

- Deepen understanding of licenses
- Choose appropriate licenses for work
- Attribute correctly

Learning Outcomes:

1. Students can compare four Creative Commons licenses and select the best fit for a sample project.
2. Students can apply a license badge and write an attribution statement for a peer's image.
3. Students can explain how license choice affects reuse or remix of their own work.

Topics:

- CC licenses: CC0, BY, NC, SA, ND
- Public domain vs. copyrighted
- Licensing your creations

Hands-on Activities:

- License a class-created image under CC
- Find music under a specific CC license
- Attribute a third-party CC asset

Weekly Assignments:

1. Pick a CC license for your project and explain the choice.
2. Find a CC-BY image for reuse.
3. Create proper attribution text.
4. Compare CC0 vs. CC-NC in examples.
5. Reflect: "Why choose CC?"

Week 9: Online Collaboration & Productivity Tools

Objectives:

- Master shared workspace platforms
- Practice version control basics
- Collaborate respectfully at scale

Learning Outcomes:

1. Students can create and share a document in a cloud workspace, assigning edit/view permissions.
2. Students can demonstrate basic version control by commenting on and reverting to a previous draft.
3. Students can conduct a respectful peer review using inline comments and suggested edits.

Topics:

- Google Workspace/Microsoft 365 features
- Commenting and version history etiquette

Hands-on Activities:

- Co-author a shared document with tracked changes
- Resolve a simple merge conflict in demo

Weekly Assignments:

1. Share a doc and assign edit rights to a peer.
2. Review version history and restore an earlier version.
3. Describe how to communicate changes to teammates.
4. Reflect: “Why is versioning important?”

Week 10: Cybersecurity Fundamentals**Objectives:**

- Identify common cyber threats
- Implement basic defence strategies
- Practice secure habits

Learning Outcomes:

1. Students can list and explain three cyber threats (malware, ransomware, social engineering).

2. Students can install and configure basic security settings (firewall, antivirus) on a mock device.
3. Students can demonstrate safe downloading practices by verifying file sources and checksums.

Topics:

- Malware, phishing, social engineering
- Antivirus, firewalls, updates
- Backup and recovery basics

Hands-on Activities:

- Simulate a phishing email recognition quiz
- Walkthrough system update process
- Backup a document to cloud storage

Weekly Assignments:

1. Identify three types of malware with descriptions.
2. Schedule and perform a mock backup.
3. List signs of a phishing attempt.
4. Explain why updates matter.
5. Share one tip to keep devices secure.

Week 11: Digital Wellness & Mindfulness**Objectives:**

- Recognize digital stressors
- Practice mindfulness and healthy habits
- Set personal boundaries

Learning Outcomes:

1. Students can identify two signs of digital overload (e.g. anxiety, sleep disruption).
2. Students can lead a 2-minute mindfulness exercise focusing on posture and breathing.
3. Students can write a personal contract outlining three screen-time boundaries.

Topics:

- Digital detox strategies
- Mindfulness apps and routines
- Balancing notifications and focus

Hands-on Activities:

- Guided mindful breathing exercise
- Configure “Do Not Disturb” on a device
- Create a personalized digital-wellness plan

Weekly Assignments:

1. Record daily screen breaks for a week.
2. Practice a 5-minute mindfulness session.
3. Turn off notifications for one hour.
4. Adjust settings to limit social media use.
5. Reflect: “How did I feel after a break?”

Week 12: Emerging Technologies & Ethics**Objectives:**

- Explore AI, AR/VR, IoT implications
- Discuss ethical considerations
- Debate technology’s impact on society

Learning Outcomes:

1. Students can describe one emerging technology and list two ethical questions it raises.
2. Students can prepare and deliver a 3-minute debate on an assigned ethical scenario (e.g. AI surveillance).
3. Students can summarize key takeaways from the debate in a one-paragraph reflection.

Topics:

- AI biases, deepfakes, data privacy
- AR/VR safety and etiquette
- IoT device security

Hands-on Activities:

- Demo a simple AI chatbot and test biases
- Create a “deepfake detection” checklist
- Brainstorm rules for VR social spaces

Weekly Assignments:

1. Identify one potential AI ethical issue.
2. Test a chatbot with a biased prompt.
3. Draft guidelines for safe VR use.
4. List security measures for IoT gadgets.
5. Reflect: “Should AI have rules?”

Week 13: Digital Rights, Advocacy & Policy**Objectives:**

- Understand youth digital rights movements
- Engage in respectful online advocacy
- Draft a simple policy proposal

Learning Outcomes:

1. Students can research and present one youth-led digital rights campaign.
2. Students can compose a respectful advocacy post or petition message on a chosen issue.
3. Students can draft a one-page policy proposal outlining a school guideline for responsible device use.

Topics:

- Net neutrality, online free speech
- Youth voices in tech policy
- Crafting persuasive digital campaigns

Hands-on Activities:

- Analyse a real-life digital rights campaign
- Draft a petition for a school digital policy

- Create social media posts advocating change

Weekly Assignments:

1. Summarize one digital rights issue.
2. Write a 140-character advocacy tweet.
3. Draft a one-page school policy proposal.
4. Share your campaign post with class.
5. Reflect: “How can I influence policy?”

Week 14: Digital Portfolio & Branding**Objectives:**

- Build a polished online portfolio
- Craft consistent personal brand
- Solicit and use feedback

Learning Outcomes:

1. Students can create a portfolio homepage with an “About Me,” project links, and contact info.
2. Students can design a consistent banner and color scheme reflecting their personal brand.
3. Students can gather peer feedback on their portfolio and implement at least two improvements.

Topics:

- Visual branding basics
- Feedback loops and iteration

Hands-on Activities:

- Design a consistent logo/profile image
- Peer-review portfolio wireframes

Weekly Assignments:

1. Publish your first portfolio page.
2. Upload project samples with descriptions.

3. Design a simple personal logo.
4. Give structured feedback on a peer's page.
5. Reflect: "What does my brand say?"

Week 15: Capstone Project & Presentation

Objectives:

- Integrate learned digital citizenship skills
- Plan and execute a peer education project
- Present findings and resources

Learning Outcomes:

1. Students can plan a 10-minute workshop teaching younger peers about a chosen digital citizenship topic.
2. Students can create supporting materials (slides, handout, demo) that illustrate core concepts.
3. Students can deliver the workshop, engage participants, and collect feedback for reflection.

Topics:

- Project planning and delivery
- Audience analysis and engagement
- Reflection and next steps

Hands-on Activities:

- Form small teams to choose a topic
- Develop educational materials (video, slides, poster)
- Present to another class or community group

Weekly Assignments:

1. Submit project proposals with objectives.
2. Create one educational resource on a chosen topic.
3. Peer-test resource and gather feedback.
4. Revise and finalize materials.

5. Present and reflect on impact and learning.

1.3 High School Digital Citizenship Curriculum (Ages 14–18)

Duration: 18 weeks

Module	Learning Objectives	Assessment
1. Foundations & Goal-Setting	• Complete a detailed digital audit • Set SMART personal & team goals	• Audit dashboard with metrics • SMART-goal presentation
2. Advanced Privacy & Security	• Implement end-to-end encryption & VPNs • Draft breach-response protocols	• Encrypted file exchange demo • Breach-response checklist
3. Professional Presence	• Optimize LinkedIn/portfolio for career readiness • Network ethically online	• Revamped LinkedIn profile critique • Outreach message peer-review
4. Cyberharassment & Law	• Analyse cyberbullying laws vs. free-speech • Advocate for safer policies	• Case-law summary report • Proposed school policy amendment
5. Media & Critical Analysis	• Detect deepfakes & manipulated media • Teach fact-checking methods	• Deepfake detection exercise • Mini-lesson deliverable on media literacy
6. Digital Rights & Policy	• Compare GDPR, CCPA, UN digital-rights frameworks • Draft persuasive policy briefs	• 1-page policy brief scored on argument quality • Online petition draft evaluated for clarity
7. Emerging Tech Ethics	• Assess AI, IoT, blockchain impacts • Develop community AI-ethics guidelines	• Ethical impact map assignment • Group-created “Top 5 AI Guidelines”
8. Wellness & Resilience	• Lead digital-wellness initiatives • Implement peer-support networks	• Wellness workshop facilitation feedback • Resilience toolkit submission
9. Leadership & Collaboration	• Run agile/scrum sprints for digital projects • Facilitate virtual team meetings	• Scrum board with sprint artifacts • Retrospective report

10. Privacy Engineering & Ethics	• Conduct Data Protection Impact Assessments (DPIAs) • Propose anonymization and minimization strategies	• DPIA worksheet graded on completeness • Anonymized dataset review
11. Incident Response & Security	• Draft incident-response plans • Coordinate tabletop breach simulations	• Tabletop exercise report • Incident-response plan evaluated for clarity
12. Accessibility & Inclusive Design	• Audit content for WCAG compliance • Implement keyboard-only and captioned interfaces	• Accessibility audit report • Prototype fixes tested in keyboard-only navigation
13. Entrepreneurship & Advocacy	• Prototype a tech-for-good startup using lean methods • Pitch to stakeholders	• Lean canvas scored on viability • Elevator-pitch judged on clarity & impact
14. Futures & Foresight	• Build scenarios for emerging-tech futures • Apply futures-thinking tools	• Futures-wheel artifact • Scenario presentation with stakeholder analysis
15. Mentoring & Teaching	• Design & deliver digital-citizenship lessons to younger cohorts • Gather and apply teaching feedback	• Lesson-plan rubric • Peer-teaching observation notes
16–17. Capstone Sprints	• Execute iterative design sprints (MVP → user-test → refine) • Track metrics & adapt roadmap	• Sprint demos evaluated on feature completion • Test-report and iteration log
18. Final Presentation & Reflection	• Showcase capstone outcomes to community • Write reflective report & set future digital-citizenship goals	• Public presentation judged on engagement & insight • 1,000-word reflection graded on depth and actionability

Week 1: Foundations & Self-Assessment

Objectives:

- Deeply review digital citizenship pillars
- Conduct personal digital audit
- Set SMART goals for growth

Learning Outcomes:

1. Students can analyse their own online behaviours against a digital citizenship rubric.

2. Students can complete a detailed digital audit (social profiles, posts, privacy settings) and identify three focus areas.
3. Students can write two SMART goals addressing those focus areas (e.g. “Reduce public posts by 50% in 1 month”).

Topics:

- Nine pillars of digital citizenship (Ribble)
- Self-audit tools and rubrics
- SMART goal framework

Hands-on Activities:

- Complete a detailed digital audit survey
- Map strengths and areas to develop
- Draft three SMART personal goals

Weekly Assignments:

1. Submit digital audit scores.
2. Identify two key improvement areas.
3. Write three SMART goals.
4. Share goals with an accountability partner.
5. Reflect: “My digital citizenship vision.”

Week 2: Advanced Privacy & Security**Objectives:**

- Implement multi-layered security
- Understand encryption
- Respond to data breaches

Learning Outcomes:

1. Students can demonstrate encrypting a document using basic PGP tools or built-in OS features.
2. Students can draft a step-by-step guide for responding to a hypothetical data breach (change passwords, notify contacts).

Topics:

- End-to-end encryption basics
- Breach response protocols

Hands-on Activities:

- Encrypt a text file and decrypt it
- Role-play breach notification process

Weekly Assignments:

1. Encrypt a message with a tool (e.g., GPG).
2. Draft a breach notification email.
3. List steps to secure an account post-breach.
4. Reflect: “How secure is my data?”

Week 3: Digital Footprint & Professional Presence**Objectives:**

- Audit real online footprint thoroughly
- Build or refine LinkedIn and portfolio
- Network professionally

Learning Outcomes:

1. Students can perform a Google search of their name and evaluate results for professionalism.
2. Students can create or update a LinkedIn profile with a professional photo, headline, and summary.
3. Students can send three tailored connection requests or informational interview messages.

Topics:

- Advanced search operators
- LinkedIn best practices
- Networking etiquette

Hands-on Activities:

- Use operators to find and delete unwanted entries

- Optimize LinkedIn headline and summary
- Reach out to a mentor with a connection request

Weekly Assignments:

1. Provide three examples of footprint results.
2. Revamp LinkedIn profile sections.
3. Draft a professional outreach message.
4. Connect with one professional in your field.
5. Reflect: “What does my profile convey?”

Week 4: Cyberbullying, Harassment & Legal Implications**Objectives:**

- Analyse legal aspects of online harassment
- Understand school and national policies
- Advocate for safe environments

Learning Outcomes:

1. Students can summarize key points of their country’s harassment laws and school code of conduct.
2. Students can analyse a case study to identify potential legal violations and recommend actions.
3. Students can draft a letter or campaign poster advocating for stricter anti-harassment measures at school.

Topics:

- Cyberbullying laws and school codes
- Harassment vs. free speech
- Reporting to authorities vs. platforms

Hands-on Activities:

- Case-law review of a cyberbullying incident
- Compare school policy vs. national law
- Draft a school policy amendment

Weekly Assignments:

1. Summarize one relevant cyberbullying law.
2. Compare it to your school's handbook.
3. Propose one policy change.
4. Role-play reporting to school admin.
5. Reflect: "My rights and responsibilities."

Week 5: Media Literacy & Critical Consumption**Objectives:**

- Master advanced fact-checking
- Detect deepfakes and manipulated media
- Teach others critical media skills

Learning Outcomes:

1. Students can use reverse-image and metadata tools to verify at least two sample images.
2. Students can identify telltale signs of deepfake videos and articulate them in a short report.
3. Students can design and deliver a mini-lesson on one advanced media literacy technique.

Topics:

- Reverse image search and metadata
- Deepfake detection indicators
- Teaching media skills

Hands-on Activities:

- Verify an image with reverse search
- Analyse a short video for deepfake signs
- Create a mini-lesson on media literacy

Weekly Assignments:

1. Fact-check one trending social post.
2. Identify two deepfake red flags.

3. Prepare slides for a 5-min mini-lesson.
4. Deliver lessons to a small group.
5. Reflect on teaching experience.

Week 6: Digital Rights, Policy & Advocacy

Objectives:

- Explore global digital rights frameworks
- Engage in online advocacy for policy change
- Draft professional policy briefs

Learning Outcomes:

1. Students can compare two international digital rights charters (e.g. UN, EU GDPR) in a Venn diagram.
2. Students can run a respectful social-media advocacy campaign using hashtags and concise messaging.
3. Students can draft a 2-page professional policy brief on a chosen digital rights issue.

Topics:

- UN digital rights charters, GDPR deep dive
- Crafting persuasive policy arguments
- Lobbying and petition tools

Hands-on Activities:

- Analyse GDPR's youth provisions
- Draft a policy brief on a local issue
- Launch a mock online petition

Weekly Assignments:

1. Write a 1-page policy brief.
2. Draft a 200-word petition statement.
3. Identify three stakeholders to petition.
4. Share a petition with the class for signatures.

5. Reflect: “How can I influence change?”

Week 7: Emerging Tech Ethics & Impact

Objectives:

- Critically assess AI, IoT, blockchain implications
- Debate ethical scenarios
- Propose ethical guidelines

Learning Outcomes:

1. Students can write a position paper analysing one emerging tech’s societal risks and benefits.
2. In teams, students can debate a preset ethical scenario and produce a joint resolution.
3. Students can formulate three ethical guidelines for responsible development or use of that technology.

Topics:

- AI fairness, algorithmic bias
- Blockchain’s privacy/trust trade-offs
- Ethical frameworks (utilitarianism, rights-based)

Hands-on Activities:

- Case debate: biased AI hiring tool
- Map stakeholders in a blockchain project
- Draft an ethical code for school tech use

Weekly Assignments:

1. Present pros/cons of AI in education.
2. Identify bias sources in a sample dataset.
3. Propose three ethics guidelines.
4. Peer-review another team’s code.
5. Reflect: “My ethical stance.”

Week 8: Digital Well-Being & Resilience

Objectives:

- Build long-term healthy digital habits
- Recognize and mitigate tech-related stress
- Cultivate digital resilience

Learning Outcomes:

1. Students can track their own daily screen-time for one week and identify high-stress usage patterns.
2. Students can develop and practice a resilience toolkit (mindfulness exercises, break schedules).
3. Students can present a reflective journal entry on progress toward healthier habits.

Topics:

- Nomophobia, social comparison impacts
- Resilience strategies: mindfulness, timeboxing
- Community support networks

Hands-on Activities:

- Guided digital detox challenge plan
- Practice a mindful notification check routine
- Design a peer support group model

Weekly Assignments:

1. Complete a 24-hour digital detox plan.
2. Log feelings before/after detox.
3. Draft a “digital resilience” toolkit.
4. Share a toolkit with a partner.
5. Reflect: “How resilient am I?”

Week 9: Collaboration, Leadership & Digital Teams**Objectives:**

- Lead virtual teams effectively
- Manage digital projects end-to-end

- Practice remote communication skills

Learning Outcomes:

1. Students can assume a team role (e.g. scrum master) and facilitate a brief virtual stand-up meeting.
2. Students can create and track tasks in a project management board (e.g. Trello) from start to finish.
3. Students can write clear asynchronous updates and feedback to team members.

Topics:

- Agile/Scrum basics for students
- Digital leadership traits
- Tools: Trello, Slack, MURAL

Hands-on Activities:

- Run a 1-sprint Scrum simulation
- Assign team roles and stand-up routines
- Use MURAL to brainstorm project vision

Weekly Assignments:

1. Create a Scrum board with tasks.
2. Conduct three daily stand-up bullet points.
3. Reflect on leadership challenges.
4. Revise project backlog based on feedback.
5. Share sprint retrospective notes.

Week 10: Privacy Engineering & Data Ethics**Objectives:**

- Explore privacy by design principles
- Conduct a data ethics impact assessment
- Propose privacy-preserving solutions

Learning Outcomes:

1. Students can evaluate an existing app's design against the "Privacy by Design" framework and note gaps.
2. Students can carry out a simple impact assessment for a hypothetical data collection project.
3. Students can propose two technical or policy measures to enhance user privacy.

Topics:

- Data minimization, anonymization techniques
- Ethics assessment frameworks (e.g., DPIA)
- Case studies: contact tracing apps

Hands-on Activities:

- Perform a mini DPIA on a mock app
- Propose anonymization for sample dataset
- Debate trade-offs in data sharing

Weekly Assignments:

1. Complete a DPIA worksheet.
2. Anonymize a small CSV file.
3. Draft a data-minimization plan.
4. Peer review another team's DPIA.
5. Reflect: "Data ethics in my project."

Week 11: Advanced Cybersecurity & Incident Response**Objectives:**

- Design incident response plans
- Understand white-hat vs. black-hat hacking
- Practice tabletop exercises

Learning Outcomes:

1. Students can develop a multi-step incident response plan outlining roles, communication, and containment.

2. Students can distinguish white-hat from black-hat techniques and list two examples of each.
3. Students can participate in a tabletop exercise simulating a security breach and debrief lessons learned.

Topics:

- IR phases: prepare, detect, respond, recover
- Ethical hacking fundamentals
- Reporting and communication in incidents

Hands-on Activities:

- Tabletop breach scenario exercise
- Draft an incident response checklist
- Role-play coordinate with “IT team”

Weekly Assignments:

1. Write an incident response one-pager.
2. List key stakeholders in a breach.
3. Simulate notifying users of an incident.
4. Reflect: “My role in incident response.”
5. Share IR plan with peer reviewers.

Week 12: Digital Design & Accessibility**Objectives:**

- Implement inclusive design principles
- Test for accessibility compliance (WCAG)
- Propose improvements for accessible content

Learning Outcomes:

1. Students can audit a website or document for WCAG compliance and record three accessibility issues.
2. Students can apply alt-text, proper heading structure, and color-contrast guidelines to sample content.

3. Students can recommend two design changes to improve usability for users with disabilities.

Topics:

- WCAG 2.1 guidelines overview
- Colour contrast, alt text, keyboard navigation
- Universal design concepts

Hands-on Activities:

- Audit a website mock-up for WCAG issues
- Add alt text to images in a demo page
- Adjust colour palettes for contrast compliance

Weekly Assignments:

1. Perform a WCAG audit on a sample page.
2. Write alt text for five images.
3. Redesign a button for keyboard focus.
4. Propose two improvements for accessible design.
5. Reflect: “Why accessibility matters.”

Week 13: Digital Entrepreneurship & Innovation**Objectives:**

- Prototype a tech-enabled social enterprise
- Understand lean startup methods
- Pitch digital solutions

Learning Outcomes:

1. Students can outline a problem statement, target user, and solution concept on a one-page Lean Canvas.
2. Students can build a low-fidelity prototype (wireframe or clickable mockup) of their product idea.
3. Students can deliver a 5-minute pitch incorporating problem, solution, market, and call to action.

Topics:

- Business model canvases for tech ideas
- MVP and user testing basics
- Pitch deck essentials

Hands-on Activities:

- Fill out a lean canvas for your idea
- Build a clickable prototype (wireframe)
- Practice a 3-minute elevator pitch

Weekly Assignments:

1. Complete a one-page lean canvas.
2. Create wireframes for MVP user flow.
3. Record and review your pitch rehearsal.
4. Peer-feedback on pitch clarity.
5. Reflect: “My venture’s social impact.”

Week 14: Emerging Tech Futures & Foresight**Objectives:**

- Explore future tech trends (quantum, bioinformatics)
- Apply futures thinking methods
- Anticipate societal impacts

Learning Outcomes:

1. Students can research and summarize one futuristic technology and its potential time-line.
2. Students can conduct a “PESTLE” analysis (Political, Economic, Social, Technological, Legal, Environmental) for that trend.
3. Students can create two foresight scenarios (best-case, worst-case) and present their implications.

Topics:

- Technology road mapping
- Scenario planning exercises

- Futures wheel and impact mapping

Hands-on Activities:

- Create a futures wheel for quantum computing
- Develop two divergent scenarios for AI in education
- Map stakeholders and impacts

Weekly Assignments:

1. Draw a futures wheel for one emerging tech.
2. Write two distinct future scenarios.
3. Share scenarios in class discussion.
4. Identify three potential societal risks.
5. Reflect: “How will I prepare?”

Week 15: Mentoring & Teaching Digital Citizenship**Objectives:**

- Plan lesson sequences for younger learners
- Practice peer teaching and feedback
- Reflect on pedagogy

Learning Outcomes:

1. Students can design a three-lesson mini-unit on digital citizenship tailored to middle-school audiences.
2. Students can deliver one lesson to peers acting as younger students and collect structured feedback.
3. Students can write a reflective critique on their teaching practice, noting strengths and areas to improve.

Topics:

- Backward design for digital citizenship lessons
- Feedback frameworks (e.g., SBI)
- Coaching and facilitation skills

Hands-on Activities:

- Design a 20-minute lesson plan for middle schoolers
- Teach it to a peer group and collect feedback
- Reflect and refine lesson materials

Weekly Assignments:

1. Submit lesson plans with objectives and activities.
2. Teach and record feedback notes.
3. Revise plan based on critiques.
4. Document teaching reflections.
5. Reflect: “My strengths as a mentor.”

Week 16: Capstone Design Sprint—Phase I**Objectives:**

- Kick off a multi-week capstone project
- Form teams and define scopes
- Plan agile sprints

Learning Outcomes:

1. Student teams can create user stories and prioritize features in a product backlog.
2. Teams can define sprint goals and tasks for the first two week- sprint.
3. Teams can set up a sprint board (physical or digital) and assign roles (e.g. product owner, developer).

Topics:

- Design sprint structure (Understand, Sketch, Decide)
- Team roles and responsibilities
- Success metrics and MVP definition

Hands-on Activities:

- Form capstone teams and choose topics
- Conduct a “How Might We...” brainstorming
- Define MVP features and acceptance tests

Weekly Assignments:

1. Document sprint goals and backlog.
2. Create user stories for MVP.
3. Assign team roles (e.g., scrum master).
4. Sketch UX wireframes for MVP.
5. Reflect: “Our sprint vision.”

Week 17: Capstone Design Sprint—Phase II**Objectives:**

- Execute development sprints iteratively
- Test and gather user feedback
- Refine based on metrics

Learning Outcomes:

1. Student teams can create user stories and prioritize features in a product backlog.
2. Teams can define sprint goals and tasks for the first two-week- sprint.
3. Teams can set up a sprint board (physical or digital) and assign roles (e.g. product owner, developer).

Topics:

- Sprint execution: develop, test, review
- Usability testing methods
- Iteration planning

Hands-on Activities:

- Code or prototype core MVP features
- Host a user-testing session and collect feedback
- Update backlog and plan next iteration

Weekly Assignments:

1. Deliver a working MVP demo.
2. Compile user feedback summaries.

3. Prioritize fixes and enhancements.
4. Execute one refinement sprint.
5. Reflect: “Sprint wins and challenges.”

Week 18: Final Capstone Presentations & Reflection

Objectives:

- Showcase capstone outcomes
- Reflect on learning journey and growth
- Set future digital leadership goals

Learning Outcomes:

1. Teams can deliver a polished final presentation/demo highlighting key features, code snippets, and impacts.
2. Students can compose a reflective report summarizing challenges, solutions, and personal growth.
3. Students can set three actionable goals for continued development as digital citizens and leaders.

Topics:

- Presentation best practices
- Reflective frameworks (e.g., Gibbs’ cycle)
- Next steps: continuing digital citizenship

Hands-on Activities:

- Deliver polished presentations to stakeholders
- Peer Q&A and feedback
- Group celebration and award certificates

Weekly Assignments:

1. Finalize capstone deliverables and slide deck.
2. Present to an audience (class, parents, or community).
3. Write a 1,000-word reflective report.
4. Outline next steps for your digital journey.

5. Celebrate achievements and share gratitude.

2. Scratch Curriculum

2.1 Primary School Scratch Curriculum (Ages 7–14)

Duration: 15 weeks

Module Topic	Learning Objectives	Assessment
1. Scratch Interface & First Animation	• Navigate the Scratch interface • Create a simple sprite animation	• Interface Elements Hunt: identify UI elements • Share first animation
2. Motion & Looks Effects	• Apply Motion blocks for movement paths • Use Looks blocks to choreograph visual effects	• Remix a peer's project • Vote on creativity
3. Events & Sound	• Trigger scripts with events (green flag, key press, click) • Integrate built-in and custom sounds	• Build a key-press reaction game • Use custom sounds
4. Loops & Timing	• Build loops with repeat and forever • Create timed sequences using wait blocks	• Draw nested patterns with loops • Timing quiz
5. Sensing & Interaction	• Detect collisions (touching) and key presses • Make sprites respond interactively	• Sensing Relay Race • Obstacle course with collision triggers
6. Variables & Conditionals	• Create, display, and update variables • Use if / if-else for decision-making	• Scoreboard project • Conditional win/lose logic
7. Scenes & Broadcasts	• Plan multiple scenes • Switch scenes using broadcasts	• Storyboard presentation (group narrative) • Backdrop/broadcast demo
8. Clones & Graphic Effects	• Generate and control clones • Apply graphic effects to multiple instances	• Clone Carnival: falling objects game • Reflection on effects
9. Capstone Project	• Combine all concepts in a playable capstone • Choose maze or storytelling format	• Capstone showcase presentation • Peer feedback

Week 1: Welcome to Scratch World

Objectives:

- Navigate the Scratch interface
- Understand sprites and stage concepts
- Create a first simple animation

Learning Outcomes:

1. Students can open an existing Scratch project, identify the Blocks Palette, Stage, and Sprite List, and explain their functions.
2. Students can add, name, and delete at least two sprites, and switch between different backdrops.
3. Students can assemble a sequence of at least three motion and look blocks to produce a basic animation (e.g. make a sprite glide and change costume).

Topics:

- Introduction to Scratch.org
- Sprites, costumes, and backdrops
- Basic block categories (Motion, Looks)

Hands-on Activities:

- Exploring pre-made projects
- Creating an account and first project
- Making the cat walk across the screen
- Changing sprite costumes

Weekly Assignments (5 exercises):

1. Make the Scratch cat say “Hello” and move right.
2. Change the cat’s costume three times on clicks.
3. Add a colourful backdrop to your project.
4. Have the cat grow bigger and smaller.
5. Create a simple “walking” animation.

Week 2: Motion & Looks Exploration

Objectives:

- Master advanced Motion blocks
- Use Looks blocks for visual effects
- Combine Motion + Looks for dynamic sprites

Learning Outcomes:

1. Students can use “point in direction,” “glide,” and “go to x:y” blocks to direct sprite movement along specified paths.
2. Students can apply at least two Look blocks (e.g. “say,” “change colour effect”) to alter sprite appearance on cue.
3. Students can synchronize a motion sequence with a visual effect (e.g. glide while changing colour) in a single script.

Topics:

- Glide, turn, and go-to blocks
- Say, think, and graphic effects
- Costume and backdrop switching

Hands-on Activities:

- Build a sprite dance routine with glide
- Use “say” and “think” blocks for dialogue
- Switch costumes to simulate action
- Code backdrop changes on click

Weekly Assignments:

1. Program a sprite to glide to random edges.
2. Make the sprite say its name for 2 seconds.
3. Apply a “colour” effect and reset it.
4. Switch backdrops via a button press.
5. Animate costume changes for a dance.

Week 3: Events & Sound**Objectives:**

- Understand event-driven programming
- Integrate built-in and custom sounds
- Trigger actions with events

Learning Outcomes:

1. Students can explain how “when green flag clicked” and “when sprite clicked” events initiate scripts.
2. Students can import at least one custom sound, place it in the Sounds tab, and play it via a “play sound” block.
3. Students can link an event (e.g. pressing a key) to both movement and sound playback in a coordinated script.

Topics:

- “When green flag” and “when sprite clicked”
- Sound blocks: play, stop, change volume
- Recording and importing sounds

Hands-on Activities:

- Play sounds on sprite click
- Record/import your own sound
- Trigger backdrop change on flag
- Loop background music

Weekly Assignments:

1. Play the “meow” sound on click.
2. Record your voice and play it.
3. Loop a drum beat 4 times.
4. Change volume with key press.
5. Trigger backdrop change on flag.

Week 4: Control Structures Basics**Objectives:**

- Learn loops (repeat, forever)

- Use wait blocks for timing
- Nest blocks for patterns

Learning Outcomes:

1. Students can construct a “repeat” loop that moves a sprite in a square or circle.
2. Students can insert “wait” blocks to pause actions and create distinguishable steps in an animation.
3. Students can nest a “repeat” loop inside another (e.g. create a spiral pattern) and describe the nesting effect.

Topics:

- Repeat, forever, and wait
- Stop and stop-all scripts
- Nesting blocks

Hands-on Activities:

- Create a looped animation
- Use wait to pace motion
- Draw shapes with nested loops
- Stop all scripts on condition

Weekly Assignments:

1. Draw a square using loops.
2. Make a sprite bounce forever.
3. Add a 0.5s wait between moves.
4. Create a countdown with repetition.
5. Stop a sprite when touching the edge.

Week 5: Sensing & Interaction**Objectives:**

- Explore sensing blocks
- Detect collisions and key presses
- Respond to user interaction

Learning Outcomes:

1. Students can use “touching colour” or “touching sprite” sensing blocks to detect collisions.
2. Students can script a sprite to move only while a specified arrow key is held down.
3. Students can program conditional feedback (e.g. “if touching edge then say ‘Ouch!’”) in response to collisions.

Topics:

- Touching, key-pressed, mouse-pointer
- Reporters vs. Boolean sensors
- Simple interactivity

Hands-on Activities:

- Detect edge collisions
- Move sprite via arrow keys
- Report mouse x/y coordinates
- Change colour on touch

Weekly Assignments:

1. Make the sprite say “Ouch!” on edge touch.
2. Control sprite with arrow keys.
3. Display mouse coordinates.
4. Detect colour touching and react.
5. Trigger action on spacebar press.

Week 6: Introduction to Variables**Objectives:**

- Understand variables for data storage
- Create, set, change, show variables
- Display dynamic information

Learning Outcomes:

1. Students can create a numeric variable, initialize it to a value, and display it on stage.
2. Students can increment and decrement the variable via scripts (e.g. score counter).
3. Students can use the variable's changing value to control a sprite's behavior (e.g. change speed based on score).

Topics:

- Creating sprite/ variables
- Set, change, show/hide variable
- Using variables in scripts

Hands-on Activities:

- Build a score counter
- Track clicks in a variable
- Display/hide score on stage
- Change variable colour/position

Weekly Assignments:

1. Create a "Score" variable.
2. Increase score by 1 on click.
3. Reset score to 0 on green flag.
4. Hide score when the game ends.
5. Move score display with arrow keys.

Week 7: Simple Conditionals**Objectives:**

- Use if and if-else blocks
- Make decisions based on conditions
- Combine sensing + conditionals

Learning Outcomes:

1. Students can write an "if" script that checks a condition (e.g. touching color) and executes an action.

2. Students can write an “if-else” block to provide alternative actions when the condition is false.
3. Students can integrate sensing blocks inside conditionals to create interactive behaviours (e.g. press space to jump if near an obstacle).

Topics:

- If, if-else, nested conditionals
- AND, OR, NOT operators
- Conditional actions

Hands-on Activities:

- Say “Hot” when touching red
- Branch animations via if-else
- Combine AND for dual conditions
- Build a simple quiz response

Weekly Assignments:

1. If the score is > 10 , say “Great!”
2. Use OR to detect arrow keys.
3. Apply NOT to invert a test.
4. Create a colour-changer with if-else.
5. Stop script if variable < 0 .

Week 8: Storytelling & Scenes**Objectives:**

- Plan multi-scene narratives
- Switch backdrops programmatically
- Coordinate sprites via broadcast

Learning Outcomes:

1. Students can outline a three-scene storyboard, naming backdrops and key actions per scene.
2. Students can use “switch backdrop to” blocks to move through scenes on cue.

3. Students can broadcast a message (e.g. “Next Scene”) and have multiple sprites respond appropriately.

Topics:

- Backdrop management
- Broadcast and receive
- Organizing scripts for story flow

Hands-on Activities:

- Storyboard a 3-scene plot
- Change backdrops on broadcast
- Add sprite dialogue per scene
- Loop background music per scene

Weekly Assignments:

1. Create 3 scenes with different backdrops.
2. Broadcast “Next Scene” to change scenes.
3. Script sprites to deliver lines in order.
4. Use waits to time dialogue.
5. Add music for scene 1 only.

Week 9: Interactive Quiz**Objectives:**

- Apply ask-and-answer blocks
- Store responses in variables
- Score and feedback logic

Learning Outcomes:

1. Students can prompt the user with “ask [] and wait,” store the reply in answer, and display it.
2. Students can compare answer to the correct value using an “if” block.
3. Students can update a score variable and provide immediate feedback (“Correct!”/“Try again!”).

Topics:

- Ask/answer reporter blocks
- Storing and evaluating input
- Conditional scoring

Hands-on Activities:

- Build a 3-question quiz
- Display correct/incorrect feedback
- Track score variable
- Show final score message

Weekly Assignments:

1. Ask “2 + 2?” and check the answer.
2. Increase score for correct answer.
3. Branch with if-else for feedback.
4. Ask yes/no questions and react.
5. Save all answers to variables.

Week 10: Broadcast & Messaging**Objectives:**

- Synchronize sprites with broadcast
- Coordinate game states
- Trigger multi-sprite behaviours

Learning Outcomes:

1. Students can define at least two broadcast messages (e.g. “Start Game,” “Game Over”).
2. Students can script sprites to change costumes or positions when receiving each broadcast.
3. Students can control overall game flow by sending and waiting for messages in sequence.

Topics:

- Broadcast vs broadcast-and-wait
- Message queues and timing

- Stopping scripts on message

Hands-on Activities:

- Create “Start Game” broadcast
- Have sprites wait for it
- Chain broadcasts for levels
- End game on “Game Over”

Weekly Assignments:

1. Broadcast “Start” on flag click.
2. Sprite A waits for “Start.”
3. Broadcast “Level2” after finishing.
4. Use broadcast-and-wait for countdown.
5. Stop all scripts on “Game Over.”

Week 11: Cloning & Effects**Objectives:**

- Create and manage clones
- Apply graphic effects to clones
- Control clone lifecycles

Learning Outcomes:

1. Students can use “create clone of” to generate multiple sprite instances dynamically.
2. Students can set different graphic effects (e.g. ghost, fisheye) on each clone.
3. Students can script clones to delete themselves under a condition (e.g. after touching edge).

Topics:

- Create clone of myself
- When I start as clone
- Delete this clone

Hands-on Activities:

- Spawn clones to follow mouse
- Fade clones with ghost effect
- Delete clones on edge touch
- Vary effect by clone index

Weekly Assignments:

1. Create 5 clones at start.
2. Move clones in random directions.
3. Gradually increase the ghost effect.
4. Delete clone when $x > 200$.
5. Count clones using a variable.

Week 12: Simple Maze Game**Objectives:**

- Combine loops, sensing, variables
- Design a playable maze
- Implement win/lose logic

Learning Outcomes:

1. Students can draw a maze backdrop and program arrow-key movement with collision detection.
2. Students can track elapsed time or movement steps with a variable displayed on screen.
3. Students can detect when the sprite reaches the maze exit and broadcast “Win” or “Lose” accordingly.

Topics:

- Maze backdrop design
- Detecting wall collisions
- Broadcast on finish

Hands-on Activities:

- Draw a simple maze backdrop

- Control sprite through maze
- Reset on wall touch
- Show “You Win” on finish

Weekly Assignments:

1. Arrow-key movement in maze.
2. If touching the wall, reset.
3. Finish line as distinct colour.
4. Broadcast “Win” on touch finish.
5. Score based on time taken.

Week 13: Digital Art & Animation**Objectives:**

- Use the Paint Editor creatively
- Animate drawings via code
- Combine pen and sprite layers

Learning Outcomes:

1. Students can draw at least two custom costumes or backgrounds using vector/bitmap tools.
2. Students can animate shapes by using pen blocks (e.g. draw a spiral with changing pen colour).
3. Students can overlay pen drawings with moving sprites to create layered animations.

Topics:

- Paint Editor tools
- Costume layers and ordering
- Pen extension basics

Hands-on Activities:

- Draw a custom sprite in editor
- Create animated costumes

- Use pen to draw shapes
- Stamp art at mouse position

Weekly Assignments:

1. Draw a flower with 3 petals.
2. Make 3 colour-variant costumes.
3. Animate petal growth via loops.
4. Change pen colour dynamically.
5. Stamp art where the sprite moves.

Week 14: Smooth Animations**Objectives:**

- Create smooth motion with glide
- Control timing precisely
- Synchronize multiple sprites

Learning Outcomes:

1. Students can script a sprite to glide between points using “glide 1 secs to x:y” for smooth transition.
2. Students can use “wait” blocks of fractional seconds (e.g. 0.2) to fine-tune timing.
3. Students can coordinate two or more sprites to move simultaneously and meet at a point.

Topics:

- Glide in seconds block
- Wait for seconds block
- Synchronizing animations

Hands-on Activities:

- Glide sprite across in 2 s
- Sequence glides with waits
- Make two sprites dance in sync
- Use waits to time starts

Weekly Assignments:

1. Glide sprites around the stage.
2. Insert waits between glides.
3. Sync costume changes to glides.
4. Return sprite home after dance.
5. Glide to random positions.

Week 15: Final Showcase Project**Objectives:**

- Integrate all learned concepts
- Plan and execute a capstone
- Present and share with peers

Learning Outcomes:

1. Students can draft a project plan listing features, scenes, and sprites to use.
2. Students can implement at least five distinct scripts incorporating events, loops, variables, and broadcasts.
3. Students can present their project live, explain their code choices, and provide/receive peer feedback.

Topics:

- Project planning & scoping
- Combining motion, looks, variables
- Sharing on Scratch community

Hands-on Activities:

- Draft storyboard and plan
- Build core features iteratively
- Test and debug collaboratively
- Publish to class studio

Weekly Assignments:

1. Submit project plan with scenes.

2. Implement ≥ 3 feature types.
3. Add on-screen instructions.
4. Gather peer feedback and refine.
5. Share project link in class studio.

2.2 Middle School Curriculum (Ages 11–16)

Duration: 15 weeks

Module Topic	Learning Objectives	Assessment
1. Scratch Interface & First Animation	• Navigate the Scratch interface • Create a simple sprite animation	• Interface Elements Hunt: identify UI elements • Share first animation
2. Motion & Looks Effects	• Apply Motion blocks for movement paths • Use Looks blocks to choreograph visual effects	• Remix a peer's project • Vote on creativity
3. Events & Sound	• Trigger scripts with events (green flag, key press, click) • Integrate built-in and custom sounds	• Build a key-press reaction game • Use custom sounds
4. Loops & Timing	• Build loops with repeat and forever • Create timed sequences using wait blocks	• Draw nested patterns with loops • Timing quiz
5. Sensing & Interaction	• Detect collisions (touching) and key presses • Make sprites respond interactively	• Sensing Relay Race • Obstacle course with collision triggers
6. Variables & Conditionals	• Create, display, and update variables • Use if / if-else for decision-making	• Scoreboard project • Conditional win/lose logic
7. Scenes & Broadcasts	• Plan multiple scenes • Switch scenes using broadcasts	• Storyboard presentation (group narrative) • Backdrop/broadcast demo

8. Clones & Graphic Effects

- Generate and control clones
- Apply graphic effects to multiple instances

- Clone Carnival: falling objects game
- Reflection on effects

9. Capstone Project

- Combine all concepts in a playable capstone
- Choose maze or storytelling format

- Capstone showcase presentation
- Peer feedback

Week 1: Refresher & Interface Deep Dive

Objectives:

- Quickly revisit Scratch fundamentals
- Explore advanced interface features
- Organize sprites, scripts, extensions

Learning Outcomes:

1. Students can demonstrate adding/removing extensions and explain their uses.
2. Students can group scripts into custom “My Blocks” sections for clarity.
3. Students can organize sprites into named folders and reorder them.

Topics:

- Scratch 3.0 interface walkthrough
- Block palette overview (+ Pen, Music extensions)
- Project notes, listings, and comments

Hands-on Activities:

- Install Pen extension and draw shapes
- Use Music extension to play notes
- Rename/colour-code sprites and scripts
- Add comments to script groups

Weekly Assignments:

1. Draw a line with Pen blocks.
2. Play a melody with Music blocks.
3. Organize two scripts into comments.

4. Import a new sprite from the library.
5. Document project assets in Notes.

Week 2: Advanced Motion & Events

Objectives:

- Leverage advanced Motion blocks
- Implement multitasking with events
- Control rotation styles

Learning Outcomes:

1. Students can use “towards mouse-pointer” and “set rotation style” blocks to refine movement.
2. Students can run parallel scripts on a single sprite via multiple “when” hats.
3. Students can switch between rotation styles (“left-right,” “don’t rotate,” “all around”) in response to user input.

Topics:

- Point towards, rotation styles
- Multiple “when” event handlers
- Touching-colour sensing triggers

Hands-on Activities:

- Program sprite to follow mouse
- Limit rotation to left/right
- Trigger sounds on different events
- Use colour sensing for interaction

Weekly Assignments:

1. Chase the mouse pointer smoothly.
2. Lock sprite rotation to not rotate.
3. Play sound on sprite tap.
4. Toggle visibility via key press.
5. Change direction on colour touch.

Week 3: Looks & Graphics Effects

Objectives:

- Master graphic effect blocks
- Create dynamic backdrops/slideshows
- Layer sprites for visual depth

Learning Outcomes:

1. Students can chain at least three graphic effects (e.g. “colour,” “brightness,” “ghost”) to achieve a specific mood.
2. Students can script an automated backdrop slideshow with timed switches.
3. Students can adjust sprite layering (front/back) to simulate foreground and background.

Topics:

- Colour, fisheye, whirl, pixelate effects
- Costume vs. costume cycling
- Backdrop switch scripting

Hands-on Activities:

- Cycle rainbow effect in loop
- Build backdrop slideshow via code
- Layer sprites for parallax effect
- Reset effects on command

Weekly Assignments:

1. Increment rainbow effect by 10.
2. Animate walking using the next costume.
3. Loop 5 backdrops every 2 s.
4. Simulate 3D depth by resizing.
5. Reset all effects with a custom key.

Week 4: Control Structures & Logic

Objectives:

- Combine nested loops + conditionals
- Use repeat-until for game logic
- Employ Boolean logic strategically

Learning Outcomes:

1. Students can build nested loops with inner conditionals to generate complex patterns (e.g. grid of shapes).
2. Students can use “repeat until” to wait for a game-over or level-complete flag.
3. Students can apply “and,” “or,” “not” operators in conditionals to handle multiple criteria.

Topics:

- Repeat until, forever if, wait until
- AND, OR, NOT in complex tests
- Stopping loops with “stop this script”

Hands-on Activities:

- Build a countdown timer
- Draw grid patterns with nested loops
- Use wait until for precise control
- Prototype a simple pattern art

Weekly Assignments:

1. Countdown 10→0 using repeat until.
2. Nest loops to draw a 5×5 grid.
3. Stop script on spacebar press.
4. Wait until the mouse clicks to proceed.
5. Use AND to detect two keys.

Week 5: Variables & Lists**Objectives:**

- Use variables for game data
- Create and manipulate lists

- Iterate lists for information

Learning Outcomes:

1. Students can maintain a list of player names or high scores and add/remove entries.
2. Students can loop through a list with “for each” to display or process items.
3. Students can use list length and indexing blocks to validate input and avoid errors.

Topics:

- Variables: set, change, show/hide
- Lists: add, delete, insert, length
- Looping through lists

Hands-on Activities:

- Track lives with a variable
- Build a list of high scores
- Display list items on stage
- Use list length in loops

Weekly Assignments:

1. Create a list of 5 names.
2. Display the number of names.
3. Remove the first item on command.
4. Loop through the list to show each.
5. Add a new item via the ask block.

Week 6: Custom Blocks & Abstraction**Objectives:**

- Abstract code into reusable blocks
- Pass parameters to blocks
- Document block behaviour

Learning Outcomes:

1. Students can define at least two custom blocks with parameters (e.g. “move And Turn(distance, angle)”).

2. Students can call their custom blocks from multiple locations, reducing script duplication.
3. Students can add a descriptive comment to each custom block explaining its purpose and parameters.

Topics:

- Defining My Blocks
- Numeric/text/boolean parameters
- “Run without screen refresh”

Hands-on Activities:

- Create a “draw shape(n)” block
- Build a “play melody” block
- Comment each custom block
- Organize main script calling blocks

Weekly Assignments:

1. Draw a triangle block with side parameters.
2. Call shape block with 4 and 5 sides.
3. Create a “reset game” block.
4. Use boolean parameters to toggle music.
5. Document each block’s purpose.

Week 7: Broadcasting & Sync**Objectives:**

- Coordinate sprites via broadcast
- Build level-based game flow
- Sync scripts with broadcast-and-wait

Learning Outcomes:

1. Students can sequence level starts and ends by broadcasting “StartLevel2,” “EndLevel3,” etc.

2. Students can ensure one sprite waits for another to finish via “broadcast and wait.”
3. Students can debug broadcast scripts by printing log messages when messages are sent/received.

Topics:

- Broadcast labels for states
- Broadcast vs wait broadcasts
- Sequencing with waits

Hands-on Activities:

- Design 3-level game blueprint
- Sync enemy spawns via broadcast
- Pause/resume via broadcast-and-wait
- Chain level transitions

Weekly Assignments:

1. Broadcast “Level1Start” on flag.
2. Sprite waits for “Level1Start.”
3. Broadcast “NextLevel” when cleared.
4. Use broadcast-and-wait for the intro.
5. Broadcast “Game Over” on loss.

Week 8: Cloning for Dynamics**Objectives:**

- Generate clones dynamically
- Manage clone behaviours
- Use clones for crowd effects

Learning Outcomes:

1. Students can spawn clones at random positions using “create clone of” inside a loop.
2. Students can script clones to follow a leader sprite or move randomly.
3. Students can remove clones cleanly when no longer needed to conserve resources.

Topics:

- create clone of myself
- when I start as clone
- delete this clone

Hands-on Activities:

- Spawn enemy clones at intervals
- Assign unique speeds/colours per clone
- Delete clones on hit
- Count clones with a variable

Weekly Assignments:

1. Spawn 10 clones at random points.
2. Change clone colour by index.
3. Destroy clones on sprite collision.
4. Track active clones count.
5. Stop spawning after 20 clones.

Week 9: Sensing & User Input**Objectives:**

- Handle complex inputs
- Use microphone and backdrop sensing
- Time-based interactions

Learning Outcomes:

1. Students can access microphone loudness and trigger actions when volume exceeds a threshold.
2. Students can detect backdrop colour changes (e.g. line-following maze).
3. Students can record the time between events and use it to influence gameplay (e.g. reaction-time test).

Topics:

- Key and mouse-button sensing

- Loudness and timer reporters
- Colour under mouse

Hands-on Activities:

- Start game on mouse click
- Trigger effect on loudness >50
- Change backdrop on colour detect
- Use timer to limit session

Weekly Assignments:

1. Launch game only on sprite click.
2. When loudness >50, change colour.
3. End game after 60 s via timer.
4. Detects and reports colour under mouse.
5. Move sprite on space bar press.

Week 10: Operators & Math Models**Objectives:**

- Use operators for logic/math
- Model randomness and probability
- Scale difficulty dynamically

Learning Outcomes:

1. Students can apply arithmetic blocks and “pick random” to simulate dice rolls.
2. Students can use modulo and floor operations to distribute outcomes evenly.
3. Students can adjust game variables (e.g. enemy speed) based on score thresholds.

Topics:

- Arithmetic, comparison, random
- Math functions: round, sqrt
- Using operators in loops

Hands-on Activities:

- Randomize enemy speed
- Compute distance to mouse
- Scale spawn rate by score
- Snap positions to grid with round

Weekly Assignments:

1. Generate random x/y spawn within 200.
2. Compute sprite distance to player.
3. Use sqrt to normalize vectors.
4. Increase speed by score/10.
5. Round positions to integer grid.

Week 11: Game Mechanics & Physics**Objectives:**

- Simulate gravity and bounce
- Implement basic momentum
- Fine-tune physics parameters

Learning Outcomes:

1. Students can apply a downward “change y by -ySpeed” script and reverse direction on bounce.
2. Students can incorporate friction by reducing the speed variable each frame.
3. Students can explain how changing mass or gravity constants affects motion realism.

Topics:

- Gravity via change y by variable
- Reverse velocity on collision
- Friction approximation

Hands-on Activities:

- Build bouncing ball simulator
- Add gravity to a falling sprite

- Implement friction slowdown
- Let user control jump

Weekly Assignments:

1. Program free fall with gravity = -2.
2. Reverse y-velocity on ground touch.
3. Reduce velocity by 10% each frame.
4. Allow jump when touching ground.
5. Display velocity variable on stage.

Week 12: Interactive Story & UI**Objectives:**

- Create menus and overlays
- Branch narrative with input
- Design user-friendly interfaces

Learning Outcomes:

1. Students can build a start menu with clickable buttons using sprites and “when this sprite clicked.”
2. Students can map user choices to different story branches via variables and broadcasts.
3. Students can overlay score, timer, or health bars that update in real time.

Topics:

- Clickable button sprites
- Show/hide for screens
- Ask blocks for choices

Hands-on Activities:

- Build start/pause menus
- Branch story by ask blocks
- Overlay score/UI elements
- Style buttons with costumes

Weekly Assignments:

1. Create a “Start” button to launch the game.
2. Show instructions on “Help” click.
3. Branch to different scenes on choice.
4. Display score in UI overlay.
5. Add the “Restart” button after the game is over.

Week 13: Debugging & Optimization**Objectives:**

- Identify and fix bugs systematically
- Optimize scripts/assets
- Document fixes and improvements

Learning Outcomes:

1. Students can use “say” or “print” blocks to trace variable values during runtime.
2. Students can refactor repeated code into custom blocks to reduce script complexity.
3. Students can compare project sizes before and after asset compression.

Topics:

- Using “See Inside” hints
- Minimizing duplicate code
- Commenting and version notes

Hands-on Activities:

- Debug provided buggy project
- Refactor duplicate blocks into custom blocks
- Compress oversized costumes
- Profile slow scripts in Turbo mode

Weekly Assignments:

1. Fix a logic bug in a sample project.
2. Refactor two scripts into one custom block.
3. Resize a 200 KB costume to <100 KB.

4. Replace infinite loops with broadcasts.
5. Add comments to major scripts.

Week 14: Capstone Project Planning

Objectives:

- Define scope and timeline
- Create detailed storyboard
- Gather required assets

Learning Outcomes:

1. Students can draft a project timeline with milestones for design, coding, and testing.
2. Students can sketch wireframes or scene layouts for at least three key screens.
3. Students can compile an asset list (sprites, sounds, backdrops) needed and note their sources.

Topics:

- Project proposals and pitches
- Wireframes and user stories
- Asset inventory

Hands-on Activities:

- Draft capstone concept sheet
- Sketch scenes and interfaces
- List sprites, sounds, backdrops needed
- Estimate development time per feature

Weekly Assignments:

1. Submit 1-page project proposal.
2. Create storyboards for 5 scenes.
3. List all required assets.
4. Write 3 user stories with criteria.
5. Develop a milestone schedule.

Week 15: Capstone Project Execution

Objectives:

- Build core features iteratively
- Test and refine mechanics
- Prepare for presentation

Learning Outcomes:

1. Students can complete a working prototype of their capstone featuring at least three interactive elements.
2. Students can log and fix at least five bugs discovered during peer testing.
3. Students can assemble a short demo video or live walkthrough highlighting key features.

Topics:

- Agile iteration in Scratch
- Peer review and feedback
- Version control via copies

Hands-on Activities:

- Develop MVP (minimum viable product)
- Conduct peer playtests
- Log issues and fixes
- Polish visuals and audio

Weekly Assignments:

1. Implement $\geq 50\%$ of planned features.
 2. Conduct a peer playtest and record feedback.
 3. Log and fix two major bugs.
 4. Refine UI and controls.
 5. Prepare a demo video for presentation.
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2.3 High School Scratch Curriculum (Ages 14–18)

Duration: 18 weeks

Module Topic	Learning Objectives	Assessment
1. Organization, Extensions & UI	• Master project organization (sprites, costumes, backdrops; consistent naming) • Explore/enable Scratch extensions and what they add • Use interface features efficiently (backpack, tabs, sprite list)	• Extension Catalog Quiz: identify and explain three Scratch extensions
2. Motion Multitasking	• Leverage Motion blocks to choreograph movement • Run multiple event scripts in parallel (green flag + key/click) • Coordinate speed/timing with wait	• Multitask Motion-Event Script: create two parallel scripts on one sprite
3. Looks Layers & Backdrops	• Layer Looks effects and control sprite ordering (front/back layers) • Switch/animate dynamic backdrops • Combine costume changes with effects (colour, ghost, fisheye)	• Graphics Effects Slideshow: automated backdrop slideshow with layered sprites
4. Advanced Loops & Logic	• Combine nested loops and repeat until • Use Boolean logic (and/or/not) for complex patterns • Time sequences with counters and wait	• Logic Puzzle Creation: design and share a nested-loop logic art piece
5. Variables & Lists	• Manage variables for game data (create, display, update, reset) • Build and iterate over lists; validate entries • Use lists/variables to drive UI and scoring	• List-Based Quiz Game: build a quiz that uses lists for questions & scoring
6. Custom Blocks & Abstraction	• Create custom blocks with parameters to abstract repeated code • Document blocks with comments and clear naming • Pass data via parameters/shared variables	• Custom-Block Library Review: exchange blocks and test each other's abstractions
7. Broadcasts & Dynamic Cloning	• Synchronize sprites with broadcast / broadcast and wait • Generate and control clones dynamically • Orchestrate clone behaviour using messages	• Broadcast & Clone Demo: group mini-game that uses messaging and clones

8. Sensing, Operators & Randomness

- Integrate **sensing** (keys, mouse, touching) into mechanics
- Use **operators** and **random** for rules/AI
- Implement condition checks and thresholds

- Sensing-Math Interactive: develop a mini-project modelling randomness and conditions

9. Capstone: Plan, Debug & Present

- Plan multi-scene project; optimize for performance
- **Debug** systematically (watch variables, say-block logs)
- Polish visuals/audio and present with documentation

- Capstone Walkthrough: present final project, document bugs fixed, and reflect on process

Week 1: Advanced Interface & Versioning

Objectives:

- Master project organization
- Utilize extensions and studios
- Plan complex project structure

Learning Outcomes:

1. Students can create and navigate project studios for collaboration.
2. Students can enable and use at least two advanced extensions (e.g. Text to Speech, Translate).
3. Students can draft a folder structure and naming convention for a multi-level game.

Topics:

- Version history and copying
- Using studios for collaboration

Hands-on Activities:

- Organize sprites/backdrops into folders
- Document assets
- Share draft to private studio

Weekly Assignments:

1. Save the project as version 1.0 and copy.
2. Translate “hello” with Translate extension.
3. List assets in Notes and Credits.

4. Invite a peer to your studio.
5. Write a feature plan in project notes.

Week 2: Project Planning & Storyboarding

Objectives:

- Define scope, goals, and audience
- Create detailed storyboards/wireframes
- Identify resources and timelines

Learning Outcomes:

1. Students can write a project brief outlining target audience, genre, and core mechanics.
2. Students can produce wireframes for UI screens and key gameplay moments.
3. Students can build a Gantt-style timeline with resource assignments.

Topics:

- Storyboarding methods
- Wireframing game/UI screens
- User stories and acceptance criteria

Hands-on Activities:

- Sketch wireframes for main screens
- Write user stories (“As a player...”)
- Peer-review storyboard drafts
- Adjust plan from feedback

Weekly Assignments:

1. Submit storyboards for ≥5 scenes.
2. Write 3 user stories with tests.
3. Estimate hours per component.
4. List required assets in spreadsheet.
5. Create a project timeline with milestones.

Week 3: Functional Abstraction

Objectives:

- Build reusable custom blocks
- Pass multiple parameters
- Document block interfaces

Learning Outcomes:

1. Students can create custom blocks accepting ≥ 3 parameters (e.g. position, size, color).
2. Students can replace at least two large scripts with calls to their custom blocks.
3. Students can write clear usage instructions for each block in the project notes.

Topics:

- My Blocks with number/text/boolean params
- “Run without screen refresh” mode
- Naming and commenting best practices

Hands-on Activities:

- Create “draw polygon(n)” block
- Build “spawn Enemy(speed)” block
- Comment each block’s purpose
- Test with varied inputs

Weekly Assignments:

1. Implement draw-polygon block for n sides.
2. Create spawn Enemy with speed parameters.
3. Document block inputs/outputs in comments.
4. Refactor two scripts to use new blocks.
5. Validate blocks with edge-case values.

Week 4: Data Structures & Cloud Variables

Objectives:

- Manage complex data sets

- Implement persistent cloud variables
- Design high-score tables

Learning Outcomes:

1. Students can set up and test cloud variables to store player stats across sessions.
2. Students can read/write to a list of high scores in the cloud and display the top five.
3. Students can handle errors when cloud variables are unavailable or exceed limits.

Topics:

- Advanced list ops (insert, delete, copy)
- Cloud variable setup and security
- Data persistence across sessions

Hands-on Activities:

- Build cloud-based leaderboard
- Secure cloud data (who can edit)
- Test synchronization across users
- Backup/reset cloud lists

Weekly Assignments:

1. Create a cloud list of top 10 scores.
2. Add new end-game scores to the cloud list.
3. Prevent duplicate high scores.
4. Display top 5 in UI.
5. Reset cloud list via admin command.

Week 5: Algorithm Visualization**Objectives:**

- Understand basic sorting/searching
- Visualize algorithm steps
- Compare efficiency

Learning Outcomes:

1. Students can code bubble sort or linear search in Scratch and animate each swap/comparison.
2. Students can count and display the number of operations taken and compare to another method.
3. Students can explain, in writing or via sprite dialogue, why one algorithm is faster.

Topics:

- Bubble sort, selection sort
- Loop counters and swapping
- Visualizing data movement

Hands-on Activities:

- Animate bubble sort on list items
- Count and display swaps/comparisons
- Compare sort on different list sizes
- Comment each step

Weekly Assignments:

1. Implement bubble sort visualization.
2. Track swaps in a variable.
3. Animate item movements.
4. Implement selection sort and compare.
5. Summarize performance differences.

Week 6: Physics Simulation**Objectives:**

- Model real-world physics
- Use variables for continuous states
- Tune parameters for realism

Learning Outcomes:

1. Students can implement equations of motion (e.g. $pos += vel$; $vel += acc$) in a loop.

2. Students can adjust acceleration due to gravity and drag coefficients to match real-world feel.
3. Students can graph position vs. time on stage using pen or sprite plots.

Topics:

- Gravity, friction, collision detection
- Continuous vs. discrete updates
- Vector visualization

Hands-on Activities:

- Build projectile simulator
- Add friction and bounce
- Visualize velocity vectors
- Parameter sliders for tuning

Weekly Assignments:

1. Code projectile motion with angle/velocity.
2. Plot trajectory points.
3. Simulate friction on ground contact.
4. Control parameters via sliders.
5. Record simulation data in a list.

Week 7: Hardware Integration**Objectives:**

- Interface with micro:bit
- Read sensor data in Scratch
- Map inputs to game controls

Learning Outcomes:

1. Students can establish a live connection between Scratch and a micro:bit to read button presses.
2. Students can write scripts that respond to analog sensor values (e.g. tilt) and map them to movement.

Topics:

- micro:bit extension (accelerometer, buttons)
- Event-driven hardware blocks

Hands-on Activities:

- Control a game via micro:bit tilt
- Map light sensor to backdrop changes
- Document wiring/calibration

Weekly Assignments:

1. Move sprite by tilting micro:bit.
2. Change backdrop on light sensor value.
3. Map analog input to volume control.
4. Submit circuit diagram + code.

Week 8: Data Visualization Dashboard**Objectives:**

- Build interactive dashboards
- Animate real-time charts
- Map data to visuals

Learning Outcomes:

1. Students can collect data (e.g. sensor or random) into lists and plot it using pen or sprites.
2. Students can update a bar chart or line graph in real time as new data arrives.
3. Students can add interactivity (e.g. hover to display exact values).

Topics:

- Pen extension for charts
- Bar, line, and pie chart concepts
- Dynamic updates via lists

Hands-on Activities:

- Plot bar chart from list data

- Animate line graph updates
- Create toggle between chart types
- Label axes and data points

Weekly Assignments:

1. Build a bar chart for 5 sample values.
2. Animate line graph with random data.
3. Toggle chart via button click.
4. Use a pen to draw axes/labels.
5. Input new data points via ask.

Week 9: Rule-Based AI Agents**Objectives:**

- Simulate decision-making agents
- Implement finite state machines
- Explore randomness vs. determinism

Learning Outcomes:

1. Students can code an enemy sprite to patrol between waypoints and switch states on collision.
2. Students can define at least three states (e.g. “idle,” “chase,” “flee”) using broadcast or variables.
3. Students can introduce probabilistic choices to vary the agent’s behavior over time.

Topics:

- If-else chains vs. state variables
- Behaviour selection and transitions
- Randomized decision ticks

Hands-on Activities:

- Create patrol/chase agent
- Track state in a variable

- Randomize patrol waypoints
- Transition on sensing player

Weekly Assignments:

1. Program agents patrol between 3 points.
2. Switch to chase when the player <50 px.
3. Idle behaviour chosen randomly.
4. Return to patrol when player >100 px.
5. Document FSM in comments.

Week 10: UX & Accessibility**Objectives:**

- Design for inclusive users
- Implement keyboard-only navigation
- Add audio/text cues

Learning Outcomes:

1. Students can ensure all game functions (start, move, shoot) are accessible via keyboard commands.
2. Students can add descriptive audio cues (e.g. “Level Up!”) for visually impaired users.
3. Students can provide on-screen text hints and alternative text for sprites.

Topics:

- High-contrast visuals
- Keyboard event mapping
- “Say” blocks for audio cues

Hands-on Activities:

- Map all controls to keys
- Announce events via “say”
- Provide text captions for sound
- Test colourblind palette

Weekly Assignments:

1. Enable full keyboard control.
2. Use “say” to announce scenes.
3. Add on-screen captions for sounds.
4. Choose a high-contrast colour scheme.
5. Document accessibility features.

Week 11: Performance Optimization**Objectives:**

- Profile and speed up projects
- Reduce clone/script overhead
- Compress and streamline assets

Learning Outcomes:

1. Students can use “stop other scripts in sprite” strategically to prevent wasted loops.
2. Students can measure project load times before and after reducing graphic resolutions.
3. Students can refactor high-cost scripts into more efficient versions (e.g. replacing polling with events).

Topics:

- Turbo mode profiling
- Efficient broadcasting vs. looping
- Costume/image optimization

Hands-on Activities:

- Profile frame rate under load
- Refactor heavy loops into blocks
- Reduce active clones count
- Resize large costumes

Weekly Assignments:

1. Identify slow script and optimize it.

2. Replace a loop with broadcast wait.
3. Halve number of clones in demo.
4. Compress a 200 KB image to <100 KB.
5. Measure performance improvements.

Week 12: Collaborative Development

Objectives:

- Manage team projects in Scratch
- Conduct peer reviews

Learning Outcomes:

1. Students can build a start menu with clickable buttons using sprites and “when this sprite clicked.”
2. Students can map user choices to different story branches via variables and broadcasts.
3. Students can overlay score, timer, or health bars that update in real time.

Topics:

- Creating and using studios
- Code review via comments
- Conceptual version control

Hands-on Activities:

- Form a 3-person studio
- Review and comment on peer code
- Merge contributions by team lead
- Resolve asset naming conflicts

Weekly Assignments:

1. Remix a peer’s project and add a feature.
2. Tag versions and updates in notes.
3. Document collaboration steps.

Week 13: Portfolio & Branding

Objectives:

- Build a cohesive Scratch portfolio
- Design project thumbnails/descriptions
- Present personal brand

Learning Outcomes:

1. Students can use “say” or “print” blocks to trace variable values during runtime.
2. Students can refactor repeated code into custom blocks to reduce script complexity.
3. Students can compare project sizes before and after asset compression.

Topics:

- Thumbnail design principles
- Writing clear descriptions
- Organizing studios by theme

Hands-on Activities:

- Create thumbnails for 3 projects
- Write elevator-pitch summaries
- Group projects into thematic studios
- Update profile bio

Weekly Assignments:

1. Design capstone project thumbnail.
2. Draft one-paragraph summary.
3. Arrange 3 projects into a studio.
4. Update bio with skills/interests.
5. Solicit feedback on portfolio.

Week 14: Mentoring & Teaching**Objectives:**

- Develop lesson-planning skills

- Practice peer teaching
- Give constructive feedback

Learning Outcomes:

1. Students can draft a project timeline with milestones for design, coding, and testing.
2. Students can sketch wireframes or scene layouts for at least three key screens.
3. Students can compile an asset list (sprites, sounds, backdrops) needed and note their sources.

Topics:

- Lesson plan structure
- Feedback methodologies
- Encouraging iteration

Hands-on Activities:

- Prepare a 10-min lesson on lists
- Teach it to a peer and observe
- Provide written feedback
- Reflect on teaching strategies

Weekly Assignments:

1. Submit a detailed lesson plan.
2. Teach a concept to a non-Scratch user.
3. Collect and summarize peer feedback.
4. Revise lessons accordingly.
5. Write a short reflection.

Week 15: Music & Sound Design**Objectives:**

- Compose interactive music
- Synchronize audio with code
- Explore advanced audio effects

Learning Outcomes:

1. Students can complete a working prototype of their capstone featuring at least three interactive elements.
2. Students can log and fix at least five bugs discovered during peer testing.
3. Students can assemble a short demo video or live walkthrough highlighting key features.

Topics:

- Music extension: beats, rests
- Tempo, volume, instrument blocks
- Sound effects and mixing

Hands-on Activities:

- Compose a 4-bar melody
- Sync sprite animation to tempo
- Layer multiple tracks
- Build an interactive drum pad

Weekly Assignments:

1. Compose melody and animate per note.
2. Control tempo via a slider.
3. Create a 4-pad drum interface.
4. Add reverb/delay effects.
5. Script mute/unmute toggles.

Week 16: Cinematic Animation**Objectives:**

- Craft cutscenes and camera effects
- Use backdrop motion for panning
- Time events to audio

Learning Outcomes:

1. Students can script a multi-sprite cutscene using coordinated broadcasts and waits.

2. Students can simulate camera panning by moving backdrops smoothly with “glide.”
3. Students can align key animation beats to highlighted points in an audio track.

Topics:

- Simulating camera pan with backdrop
- Fade-in/fade-out techniques
- Cueing actions with waits

Hands-on Activities:

- Pan the backdrop smoothly
- Script fade transitions
- Animate character dialogues with zoom
- Sync to a music track

Weekly Assignments:

1. Create a sideways pan effect.
2. Fade to black and back.
3. Script a 5-line dialogue cutscene.
4. Sync events to an audio cue.
5. Loop cutscene for refinement.

Week 17: Capstone Development**Objectives:**

- Implement full project plan
- Iterate with feedback
- Track milestones

Learning Outcomes:

1. Students can complete at least 80% of their initial project scope and document any changes.
2. Students can log feedback from peers/mentors and apply at least three substantial improvements.

3. Students can update their project timeline with new milestones based on actual progress.

Topics:

- Turning storyboards into code
- Milestone tracking and stand-ups
- Peer code reviews

Hands-on Activities:

- Code core features per plan
- Hold weekly peer stand-up
- Test and log bugs
- Refine per feedback

Weekly Assignments:

1. Code $\geq 50\%$ of planned features.
2. Submit milestone demo.
3. Document bugs/fixes.
4. Implement peer suggestions.
5. Update timeline in Notes.

Week 18: Final Presentation & Reflection**Objectives:**

- Showcase capstone project
- Reflect on learning journey
- Plan next steps

Learning Outcomes:

1. Students can deliver a 5-minute presentation demoing their capstone's features and code highlights.
2. Students can write a one page reflection summarizing challenges, successes, and future goals.
3. Students can identify at least two new skills or topics they'd like to explore post capstone.

Topics:

- Presentation best practices
- Writing reflective reports
- Setting future goals

Hands-on Activities:

- Present in class studio
- Write a personal blog post
- Collect mentor/peer feedback
- Define goals for future projects

Weekly Assignments:

1. Record a 3-min demo video.
2. Write a 500-word reflection.
3. List 3 next-project goals.
4. Share project + reflection publicly.
5. Celebrate achievements with peers.

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