

LEVEL 1 · FOUNDATIONS

GOLD STANDARD WORKBOOK

Eight complete beginner lessons for understanding sound and working confidently inside Logic Pro. This workbook combines theory, guided listening, practical tasks, reflection and knowledge checks.

How to use this workbook

Study one lesson at a time. Do the listening exercise before changing controls. Follow the Logic Pro task and write down what you observed. Complete the knowledge check without looking at the answers, then use the explanation to correct misunderstandings.

Core principle throughout the Academy

Listen first, then decide. Meter readings and diagrams help you investigate a question; they do not replace listening to the actual source in the context of the music.

1. What is sound?

Learning target: Explain the core concept in your own words and demonstrate it in Logic Pro.

Sound begins when a source vibrates and creates pressure variations in a medium, usually air. These variations travel to the ear. A microphone diaphragm responds to them and produces an electrical signal; an audio interface converts the analogue signal into digital samples for the DAW. Playback converts the samples to an electrical signal that drives headphones or speakers, which move air again.

A waveform is a visual representation of signal amplitude over time. It can help locate transients, pauses and edits, but it cannot tell you whether a performance feels convincing or a mix is tonally balanced. Musical sounds contain changing spectral components; the balance and evolution of those components contribute to timbre.

Logic Pro practical

Tap a desk or speak a vowel. Trace source → air → microphone → interface → DAW → playback. Create an audio track and a software instrument track; compare an audio region with a MIDI region.

Guided listening

Compare a soft spoken phrase and a clap. What can the waveform show? What must be judged by listening?

Common mistakes to avoid

Assuming a larger waveform means better sound; treating MIDI as recorded audio; judging only by pictures.

Reflection and completion

Write down: (1) what you expected, (2) what you did, (3) what you heard or measured, (4) what changed, and (5) why you kept or reversed the change. Completion task: Explain the full path from source to headphones and distinguish the physical sound, the waveform and the track.

2. Frequency, amplitude and phase

Learning target: Explain the core concept in your own words and demonstrate it in Logic Pro.

Frequency is cycles per second, measured in hertz (Hz). For a simple periodic tone, frequency is closely related to pitch. Amplitude describes the size of a signal variation and relates to signal level, but perceived loudness also depends on frequency content, duration and listening conditions. Phase describes a waveform's position within its cycle relative to a reference.

When related signals combine, their phase relationship can reinforce or partially cancel. Identical time-aligned signals reinforce; an identical signal shifted by half a cycle can cancel under ideal conditions. Polarity inversion flips signal sign; it is not identical to every possible time delay. Check what happens audibly rather than treating phase as inherently good or bad.

Logic Pro practical

Play the same note in two octaves. Compare level separately from pitch. Duplicate a short region and compare aligned versus slightly shifted copies; describe any tonal or transient change.

Guided listening

Describe pitch, level and any changes when two copies are aligned and then shifted. Avoid using "louder" to describe pitch.

Common mistakes to avoid

Calling frequency volume; assuming phase is always a problem; confusing polarity inversion with any time delay.

Reflection and completion

Write down: (1) what you expected, (2) what you did, (3) what you heard or measured, (4) what changed, and (5) why you kept or reversed the change. Completion task: Explain frequency, amplitude and phase using one example of each from your session.

3. Decibels and gain staging

Learning target: Explain the core concept in your own words and demonstrate it in Logic Pro.

A decibel expresses a ratio on a logarithmic scale; the reference matters. dBFS describes digital level relative to full scale, dBu/dBV refer to electrical levels, and SPL describes acoustic sound pressure. In digital audio, 0 dBFS is the full-scale ceiling. Peaks above it clip at that stage. Peak, RMS and loudness measurements answer different questions.

Gain staging means managing levels throughout recording, tracks, plugins, buses and outputs. It is not about making every meter as loud as possible. A compressor can react differently when its input level changes because the signal's level relative to threshold changes. Compare processed and unprocessed audio at similar perceived loudness.

Logic Pro practical

Observe peak meters. Lower a region's gain and compare. Feed a compressor at two different input levels while keeping threshold unchanged; note how gain reduction changes. Avoid clipping the stereo output.

Guided listening

Compare two versions at matched loudness. Listen for clipping or unwanted compression rather than choosing the louder version automatically.

Common mistakes to avoid

Treating 0 dBFS as a target; maximising every meter; comparing versions without matching loudness.

Reflection and completion

Write down: (1) what you expected, (2) what you did, (3) what you heard or measured, (4) what changed, and (5) why you kept or reversed the change. Completion task: Map levels at the region, track, plugin, bus and stereo output. Identify any clipping and describe the remedy.

4. Digital audio: sample rate and bit depth

Learning target: Explain the core concept in your own words and demonstrate it in Logic Pro.

A converter samples an analogue signal at regular time intervals and represents each measurement as a number. Sample rate is samples per second; 48 kHz means 48,000 samples per second. The theoretical Nyquist frequency is half the sample rate. Appropriate filtering helps prevent frequencies above the representable band from folding into lower frequencies as aliasing.

Bit depth determines the number of amplitude quantisation values available per sample and affects theoretical quantisation dynamic range. Higher sample rate or bit depth is not an automatic guarantee of audible improvement in every context. Choose settings for the delivery workflow, record with healthy headroom, and verify the actual exported file.

Logic Pro practical

Find the Logic Pro project sample-rate setting. Note it, export a short test file in the intended delivery format, then inspect the export settings. Write down why the chosen sample rate and bit depth fit the project.

Guided listening

When comparing exports, check that loudness and playback path are controlled. Do not assume a larger sample-rate number proves a better result.

Common mistakes to avoid

Confusing sample rate with bit depth; assuming higher numbers automatically improve sound; forgetting to verify export settings.

Reflection and completion

Write down: (1) what you expected, (2) what you did, (3) what you heard or measured, (4) what changed, and (5) why you kept or reversed the change. Completion task: Write a delivery note listing sample rate, bit depth, intended format and how you verified the exported file.

5. Audio signal flow

Learning target: Explain the core concept in your own words and demonstrate it in Logic Pro.

A signal path is the route audio takes through the session. A common path is region/source → channel inserts → fader/pan → bus or send → stereo output → interface → headphones/speakers. Exact routing depends on the project. Inserts process the main channel path; sends route some signal to another channel, often an aux with shared reverb or delay.

When a track is silent, diagnose systematically: source region, track mute/solo, inserts and bypass, channel output, bus destination, stereo output, interface selection and monitoring level. Do not add random plugins or raise every fader. Find the first point where the expected signal disappears or becomes too loud.

Logic Pro practical

Route one track to the stereo output. Create a reverb send if available. Bypass an insert and compare. Draw the real path through inserts, sends, buses and outputs.

Guided listening

Compare a direct insert reverb with a send-based reverb, matching the dry signal as closely as possible.

Common mistakes to avoid

Adding plugins before checking routing; using a send without understanding it; lowering the master instead of finding the source of a level problem.

Reflection and completion

Write down: (1) what you expected, (2) what you did, (3) what you heard or measured, (4) what changed, and (5) why you kept or reversed the change. Completion task: Draw the signal path of one track, including every insert, send, bus and output.

6. Understanding your DAW

Learning target: Explain the core concept in your own words and demonstrate it in Logic Pro.

A DAW combines recording, editing, MIDI sequencing, instruments, mixing, automation and export. Tracks organise content and routing; regions are pieces of content placed on the timeline. The arrangement shows content over time, the transport controls playback and recording, the mixer shows channel strips, and editors provide detailed audio or MIDI editing.

A channel strip may include inserts, sends, pan, fader, meter and output routing. Automation changes a parameter over time. Save versions before major edits, name tracks clearly, keep assets organised and back up projects. Moving a fader changes signal level at that point; it does not automatically rewrite the source audio file.

Logic Pro practical

Identify the arrangement, transport, playhead, track list, mixer and editor. Rename tracks, organise regions, save a versioned project, close it and reopen it to verify the project is usable.

Guided listening

Solo each track, then listen to the full arrangement. Describe each track's role and how the arrangement changes over time.

Common mistakes to avoid

Confusing a track with a region; assuming a fader edits the source file; losing media because project files are scattered.

Reflection and completion

Write down: (1) what you expected, (2) what you did, (3) what you heard or measured, (4) what changed, and (5) why you kept or reversed the change. Completion task: Save a tidy mini-session with named tracks, organised regions and a versioned project.

7. MIDI versus audio

Learning target: Explain the core concept in your own words and demonstrate it in Logic Pro.

MIDI normally contains performance instructions such as note-on/note-off events, pitch, timing, velocity and controller data. A software instrument interprets those instructions and generates audio. An audio file contains samples representing a recorded or rendered signal, including performance, tone, room and other captured details.

MIDI is flexible for changing notes, timing and performance data. Audio is useful for capturing performances, committing instrument parts and sharing rendered sound. Bouncing an instrument to audio can simplify collaboration or reduce CPU use, but keep the original MIDI and instrument settings when future revision may be needed.

Logic Pro practical

Create a four-note MIDI region and change pitch/velocity. Record or import a short audio file. Bounce the instrument to audio if you know how, while keeping the original MIDI editable.

Guided listening

Compare MIDI velocity changes and bounced audio. Does velocity change only level, or also timbre or articulation?

Common mistakes to avoid

Calling MIDI a sound file; assuming velocity only affects volume; deleting MIDI after bouncing without a backup.

Reflection and completion

Write down: (1) what you expected, (2) what you did, (3) what you heard or measured, (4) what changed, and (5) why you kept or reversed the change. Completion task: Create one MIDI part and one audio part, then explain what remains editable in each.

8. Critical listening fundamentals

Learning target: Explain the core concept in your own words and demonstrate it in Logic Pro.

Critical listening means listening with a clear question. Describe the audible symptom before selecting a tool. “The vocal becomes harder to understand when the guitars enter” is an observation; “boost 5 kHz” is a proposed solution that still needs testing. Other causes could include arrangement masking, performance, level or microphone tone.

Use controlled A/B comparisons at matched loudness because louder can seem better. Listen to the full mix for emotion and balance, then to a short section for a specific issue. Check at a sensible low level and occasionally in mono or on another system. Use specific words such as boomy, thin, harsh, smeared, distant or dry, and write down what changed.

Logic Pro practical

Listen to 20–30 seconds without touching controls and write three observations. Choose one issue, make one change, compare at matched loudness, then keep or undo it with a reason.

Guided listening

Listen once for emotion, once for low-end balance, once for vocal intelligibility, and once for space. Write observations before proposed fixes.

Common mistakes to avoid

Changing several controls at once; trusting the louder version; using frequency numbers instead of describing the symptom.

Reflection and completion

Write down: (1) what you expected, (2) what you did, (3) what you heard or measured, (4) what changed, and (5) why you kept or reversed the change. Completion task: Complete a listening log: three observations, one chosen issue, the test, the level-matched A/B result, and the reason for keeping or undoing the change.

Level 1 Knowledge Check

The website contains the separate Level 1 final assessment. Use this short check as a lesson review; the separate assessment and answer-key PDFs remain available in the Download Centre.

Frequency, Amplitude and Phase

Lesson review questions are included in the interactive website lesson, where answers and explanations appear after submission.

Decibels and Gain Staging

Lesson review questions are included in the interactive website lesson, where answers and explanations appear after submission.

Digital Audio: Sample Rate and Bit Depth

Lesson review questions are included in the interactive website lesson, where answers and explanations appear after submission.

Audio Signal Flow

Lesson review questions are included in the interactive website lesson, where answers and explanations appear after submission.

Understanding Your DAW

Lesson review questions are included in the interactive website lesson, where answers and explanations appear after submission.

MIDI Versus Audio

Lesson review questions are included in the interactive website lesson, where answers and explanations appear after submission.

Critical Listening Fundamentals

Lesson review questions are included in the interactive website lesson, where answers and explanations appear after submission.

Self-assessment rubric

Skill	Not yet	Developing	Confident
Explain the concept	Needs the definition	Explains with prompts	Explains in own words
Use Logic Pro	Task incomplete	Can follow steps	Can repeat and describe results
Listen critically	Makes guesses	Can name symptoms	Tests changes and explains choices
Manage project	Files disorganised	Can save and reopen	Uses clear names and versions