COLOR GRADING COURSE · LEVEL 3 · EXPERT

Level 3 Workbook

Every "Do it" exercise from Lessons 3.1–3.10, plus the Level 3 capstone — pipeline document, HDR/SDR grading and self-QC — with checkboxes and a completion sign-off.

Learner name _____

Start date _____

Resolve version _____

> **How to use this workbook.** Work through the lessons in order — each page mirrors that lesson's "Do it" section, with the check the lesson asks you to confirm. Tick each box as you complete it. There's a notes strip on every page. Part A of the capstone (page 12) uses the separate **Show Pipeline Document template** download — fill that in alongside this page. Finish with the sign-off (page 15).

CONTENTS

1. 3.1 · Color science foundations
2. 3.2 · Tone & gamut mapping, DRTs
3. 3.3 · Show pipeline & show LUT design
4. 3.4 · DCTL
5. 3.5 · Print film emulation — construction
6. 3.6 · HDR grading
7. 3.7 · Dolby Vision & derived deliverables
8. 3.8 · Deliverables & QC
9. 3.9 · Dailies & VFX interchange
10. 3.10 · The working colorist
11. Level 3 capstone — Pipeline & masters
12. Completion sign-off

3.1 Color science foundations

Reason from chromaticity diagrams and color models, and explain display- vs scene-referred from first principles.

Do it

- [ ] Open Resolve's **CIE scope** (Color page → Scopes → CIE). Put a colorful shot up and watch the trace sit inside the horseshoe. Overlay the Rec.709 and P3 gamut triangles and find pixels that fall outside Rec.709 but inside P3.
- [ ] Push saturation hard on a saturated red and watch the trace crawl toward the edge of the triangle — a gamut excursion, live.
- [ ] Switch a clip's color science between **display-referred** (plain Rec.709) and a **scene-referred** managed setup (DaVinci Wide Gamut/Intermediate). Push exposure +2 stops in each. Note how one clips and the other rolls off.
- [ ] Find D65 on the CIE scope (drop the white point) and confirm neutral greys land on it.

> **You can move on when you can…** read a chromaticity diagram out loud — point to the spectral locus, a gamut triangle, and D65 — name what CIELAB or IPT buys you over RGB, and explain in one clean sentence the difference between a display-referred and a scene-referred image.

NOTES — WHAT YOU SAW

3.2 Tone & gamut mapping, DRTs

What turns a scene-referred image into a picture, and how to debug any image problem in pipeline terms.

Do it

- [ ] Take a scene-referred clip in DaVinci Wide Gamut/Intermediate. Add an output CST and toggle its **gamut mapping** on and off while a neon or a saturated flower fills frame. Watch pinned colors ease inward on the CIE scope.
- [ ] Swap the **output color space / DRT**: render the same graded clip to Rec.709, then to P3-D65. Note the tone-map and gamut differences on a wipe.
- [ ] Grade one shot under two DRTs (a DaVinci film-look output vs a plain Rec.709 CST). Match them by eye, then note how differently each one made you push.
- [ ] Write, for one broken frame you've seen, one sentence naming whether it was a tone-mapping, gamut-mapping, or viewing-condition problem.

You can move on when you can… define a DRT and name its two jobs, explain why compression beats clipping for out-of-gamut color, and — shown any broken image — say in one sentence whether it's a tone, gamut, or viewing-condition problem.

NOTES — WHAT YOU SAW

3.3 Show pipeline & show LUT design

Design the working-space and transform chain a whole production runs on.

Do it

- [ ] Build the pipeline skeleton in Resolve: a group **pre-clip** node doing the input CST per camera, a **timeline** node holding a placeholder show look, and an **output** CST.
- [ ] Put your look on the timeline node as an **LMT-style step** (scene-referred, before output). Swap the output CST from Rec.709 to P3 and confirm the same look survives into the new display space.
- [ ] **Version your look:** save it as ShowLook_v01 in the gallery/PowerGrade, tweak it, save v02, and keep a one-line changelog.
- [ ] Draft the seven-section pipeline document for an imaginary two-camera show — use the **Show Pipeline Document template** download.

> **You can move on when you can…** draw a show pipeline as an input → working-space → look → output chain, explain why the show look sits scene-referred before the DRT, say what an AMF carries, and write a pipeline document with the seven sections.

NOTES — WHAT YOU SAW

3.4 DCTL

Read and modify simple DCTLs, and understand the math of common operations.

Do it

- [ ] Type the do-nothing boilerplate, save it to your DCTL folder, restart Resolve, and confirm it changes nothing. That's your baseline.
- [ ] Add the exposure slider and `_powf(2.0f, exposure)` gain. Set it to +1 stop, wipe it against a Gain node, and check they match on the waveform.
- [ ] Add the three printer-light sliders. Warm the image with *Red print* up / *Blue print* down and watch the parade.
- [ ] Break it on purpose: delete a semicolon, then read Resolve's `r_debug.log` to find the error.

> **You can move on when you can…** read a simple DCTL and say what each line does, write an exposure or per-channel-gain transform yourself, explain why one stop is `_powf(2, n)`, and say what a 3×3 matrix does that a curve can't.

NOTES — WHAT YOU SAW

3.5 Print film emulation — construction

Build a print-film-emulation chain rather than apply one — negative-to-print, status-M density, printer lights.

Do it

- [ ] Take a normalized, exposed log shot. Load Resolve's **Kodak 2383** LUT and study its R/G/B curves — find the midpoint convergence, the cool shadows, the warm highlights.
- [ ] Rebuild the **main curve** first, desaturated: match an editable spline to the 2383's grayscale contrast on a smooth-gradient reference.
- [ ] Add a **tint node** at reduced gain and draw only the deviation — blue up in the shadows, red/green up in the highlights.
- [ ] Add a **printer-lights** node (Primaries → Log, or the Printer Lights control) and rebalance in points.
- [ ] Swap the main curve for a plain LogC→Rec.709 CST — tame the contrast while keeping the color. Add halation and grain on top.

> **You can move on when you can…** explain a print emulation as negative-density → print → tint → white-point stages, describe what status-M density measures, define printer lights and why they work in log, and rebuild a print LUT's main curve and tint as separable nodes you can adjust.

NOTES — WHAT YOU SAW

3.6 HDR grading

Grade in a much bigger box — PQ/HLG, nits, MaxCLL/MaxFALL, Rec.2100 — and derive an SDR trim, honestly.

Do it

- [ ] Set a project to a color-managed wide space; set the output to **Rec.2100 PQ, 1000 nits** (P3-D65 limited). Enable HDR monitoring if you have a display; otherwise enable tone-mapping preview.
- [ ] Grade a high-contrast shot with a practical light or window. Push the specular *up* into the bright range instead of clipping it.
- [ ] Export and read the measured **MaxCLL / MaxFALL** Resolve reports. Note how a bright frame moves them.
- [ ] **Derive an SDR trim:** flip the output to Rec.709/Gamma 2.4 and do a light per-shot pass — pull speculars back under clipping, rescue any lost shadow.
- [ ] Write one honest sentence about your display: what you could and couldn't judge.

> **You can move on when you can…** read an HDR delivery spec line by line, explain PQ vs HLG and absolute vs relative, define nits/MaxCLL/MaxFALL, grade in a PQ timeline, derive an SDR trim, and state honestly what your display can and can't judge.

NOTES — WHAT YOU SAW

3.7 Dolby Vision & derived deliverables

L1 analysis, L2 trims, the CMU, and deriving an SDR master with no second file.

Do it

- [ ] On your HDR-graded short (3.6), open the **Dolby Vision palette** and run a full **L1 analysis** across the timeline.
- [ ] Set the target display to **100-nit BT.709** and enable tone-mapping preview — this is the derived SDR, mapped live by the software CMU.
- [ ] Author **L2 trims** on three shots: rescue a shadow that fell dark, pull a specular back under clipping, nudge a color. Confirm the HDR is untouched.
- [ ] Export the **Dolby Vision XML**, then QC it: validate with Metafier if available, confirm PQ in the file metadata, and visually QC HDR vs derived SDR against each other.

> **You can move on when you can…** explain Dolby Vision as dynamic per-shot metadata over one HDR master, distinguish L1 analysis from L2 trims, say what the CMU and the XML are, author an SDR trim conceptually, and run the three-part QC (Metafier / MediaInfo / visual).

NOTES — WHAT YOU SAW

3.8 Deliverables & QC

Package masters as IMF and DCP, understand XYZ and legal ranges, and QC against a streamer spec.

Do it

- [ ] **Read a real spec.** Open the Netflix Partner Help delivery specs and list the exact requirements for one deliverable — container, codec, color space, levels, metadata.
- [ ] **Legal-range QC** your Level 2 master: turn on broadcast-safe scope limits, scrub the timeline, and find anything clipping the ceiling or crushing the floor that shouldn't. Clamp or re-trim.
- [ ] **Export an IMF** from Resolve (Deliver page → IMF preset, App2E if available) and inspect the package: the separate video/audio track files, the CPL, the PKL.
- [ ] **Think Harding:** identify any shot with a hard flash or strobe and note how you'd soften it if a PSE report failed.
- [ ] If you have a DCP preset, export a short **DCP** and note the X′Y′Z′ conversion in the render settings.

> **You can move on when you can…** explain IMF's componentized structure and why it makes versions cheap, say what a DCP is and why it uses X′Y′Z′, keep a master in legal ranges, read a streamer spec and QC against it, and explain what a Harding test protects against.

NOTES — WHAT YOU SAW

3.9 Dailies & VFX interchange

A color-managed dailies loop with per-scene CDLs, and a VFX plate hand-off that comes back matching.

Do it

- [ ] **Build a dailies project:** ACEScct color management, Luminance Mixer zeroed. Load a show look as a timeline DRX and give two clips different CDLs (Lift/Gamma/Gain/Sat only). Export an ALE/EDL + CSV.
- [ ] **Round-trip it:** in a fresh conform project with identical settings, import a cut timeline, import the metadata CSV, and ColorTrace the CDLs back on — confirm the clips go green.
- [ ] **Re-apply looks two ways:** one show look on a timeline node; multiple scene looks via smart filters → groups → post-clip DRX nodes.
- [ ] **VFX hand-off:** export one shot as a scene-linear OpenEXR sequence in ACES/your working space (un-graded); confirm re-importing and re-applying your grade matches the original.

> **You can move on when you can…** design a dailies loop (show look + CDLs, kept portable), round-trip CDLs to conform with ColorTrace, and specify a VFX hand-off — un-graded scene-linear EXR in a known space, with the show look for preview — that comes back matching.

NOTES — WHAT YOU SAW

3.10 The working colorist

The career ladder, pricing, the reel, client language and session etiquette, plus Baselight literacy.

Do it

- [ ] **Place yourself on the ladder.** Write which rung your current reel honestly supports, and the one skill from this course that gets you to the next.
- [ ] **Cut a 60-second reel** from your best work — matched, consistent, aimed at the segment you want (most likely start: corporate/creator). One weak shot out.
- [ ] **Run a mock session.** Have someone give you vague notes ("warmer," "moodier," "make her pop") and practice making the move in under ten seconds each, narrating in client language, not tech.
- [ ] **Prep three look options** for one shot from a one-line brief, and separately practice building one live.
- [ ] **Baselight flashcards:** write one sentence each for T-CAM, BLG and OCIO. If you can explain them cold, you're literate.

> **You can move on when you can…** place yourself on the color ladder and name the next rung, say where the paying work is, run a supervised session in client language with the right prep for the client type, cut a focused reel, and explain T-CAM, BLG and OCIO cold.

NOTES — WHAT YOU SAW

★ Level 3 capstone — Pipeline & masters

Gate: design a pipeline and deliver HDR/SDR masters that pass QC. Three parts: (A) pipeline document, (B) HDR grade + SDR trim, (C) self-QC.

Part A — Write the show pipeline document

Design the pipeline a production would hand to its DIT, dailies lab, editorial, VFX and finishing team — a document someone else could follow (3.3 is the source).

> ☐ Complete the separate **Show Pipeline Document — Template** download (all seven sections: working space, input transforms, show LUT, output transforms, dailies CDL workflow, VFX interchange, deliverables & QC) and attach it to this workbook.

Part B — Grade in HDR, derive an SDR trim

Take your finished Level 2 short and re-finish it for HDR, then derive SDR.

- ☐ **Set up the HDR pipeline** from your Part A document: color-managed wide working space, output to Rec.2100 PQ, P3-D65 limited, 1000 nits.
- ☐ **Grade for the bigger box.** Place speculars and practicals up into the bright range instead of clipping them; keep middle grey where it belongs.
- ☐ **Honest-display note:** if you have a calibrated HDR reference display, grade on it. If not, grade in a PQ timeline anyway, use the tone-mapping preview, and label your output HDR-simulated with one sentence on what you could and couldn't judge.
- ☐ **Derive the SDR trim.** Re-target to Rec.709/Gamma 2.4 and do a light per-shot trim — pull speculars back, rescue lost shadow — *without* re-grading. Optionally run an L1 analysis and author L2 SDR trims as metadata (3.7).

NOTES — PIPELINE CHOICES, HDR DISPLAY USED (OR NOT)

★ Level 3 capstone — the spec & self-QC

Grade and QC to this — it's the point. Then run Part C: validate → verify → view.

The spec (grade and QC to this)

HDR master: Rec.2100, PQ / ST.2084, P3-D65 limited, 1000-nit target, 10-bit, UHD (or 1080p if that's your source). Measured MaxCLL / MaxFALL present on export.

SDR master: Rec.709 / Gamma 2.4, D65, derived by trim (or Dolby Vision metadata) from the HDR — creative intent preserved, nothing clipping or crushing beyond intent.

Legal ranges: both masters broadcast-safe; nothing above the ceiling or below the floor except intentional speculars/practicals.

Container / codec: a flattened master file per version (ProRes 4444 XQ or your system's HDR-capable codec; ProRes 422 HQ for SDR).

Metadata: HDR transfer characteristic reads PQ (verify in MediaInfo if available); MaxCLL/MaxFALL or a valid Dolby Vision XML present.

Compliance: think Harding — flag any hard flash/strobe in your short and note how you'd soften it.

Naming: ShortTitle_HDR_PQ_P3D65_1000nit_v01.mov and ShortTitle_SDR_Rec709_v01.mov

Part C — Self-QC both masters

Run the finishing QC discipline from 3.7/3.8: **validate → verify → view.**

- ☐ **Pipeline document complete** — all seven sections written, choices justified, another colorist could follow it.
- ☐ **HDR grade uses the box** — speculars live in the bright range, not clipped; middle grey correct; no illegal excursions.
- ☐ **Metadata correct** — MaxCLL/MaxFALL measured and present; transfer characteristic reads PQ; (if Dolby Vision) XML validates.
- ☐ **SDR is a trim, not a re-grade** — intent preserved from HDR; wipe HDR-intent vs SDR and the story reads the same.
- ☐ **Legal & compliant** — both masters broadcast-safe; flash risks flagged for Harding.
- ☐ **Honest about the display** — if HDR-simulated, said so, with a note on what you couldn't judge.

★ Level 3 capstone — self-assessment rubric

Grade yourself honestly against the Level 3 competency.

GRADE	WHAT IT LOOKS LIKE
Not yet	The pipeline document is vague or incomplete; or the HDR grade just brightens the SDR (no use of the bigger box); or the SDR is a fresh re-grade rather than a trim; or a master misses the spec; or you claimed to finish HDR on a display that can't show it. Any of these is a Not yet.
Passing	A complete, followable show pipeline document; an HDR grade that genuinely uses the range with correct metadata; a derived SDR trim that preserves intent; both masters legal and to spec; and — if you lacked an HDR display — an honest HDR-simulated label with a note on the compromise.
Strong	All of the above, plus the pipeline document is one you could actually hand a facility, the HDR grade shows deliberate use of speculars and shadow depth, the SDR trim is minimal and invisible, and your self-QC caught and fixed at least one real issue before you called it done.

You pass Level 3 — and finish the course — at Passing or above. At Strong, you've demonstrated the whole Expert gate: you can run color for a production. The next step isn't another lesson — it's reps, a reel, and the first job (3.10).

NOTES — WHAT YOU'D FIX FIRST

✓ Completion sign-off

Level 3 · Expert — Color Grading Course

Lesson exercises completed

- ☐ 3.1 · Color science foundations
- ☐ 3.2 · Tone & gamut mapping, DRTs
- ☐ 3.3 · Show pipeline & show LUT design
- ☐ 3.4 · DCTL
- ☐ 3.5 · Print film emulation — construction
- ☐ 3.6 · HDR grading
- ☐ 3.7 · Dolby Vision & derived deliverables
- ☐ 3.8 · Deliverables & QC
- ☐ 3.9 · Dailies & VFX interchange
- ☐ 3.10 · The working colorist
- ☐ Level 3 capstone — Pipeline & masters (Parts A, B, C)

Capstone self-assessment grade (from page 14) — check one.

☐ Not yet ☐ Passing ☐ Strong

I confirm I have completed every Level 3 lesson exercise and all three parts of the Level 3 capstone described in this workbook, including the Show Pipeline Document template and the HDR/SDR spec self-QC.

Learner signature _____ Date _____

Print name _____ Reviewed by (optional — mentor / instructor) _____

Once signed off, you've completed **Color Grading — From Zero to Colorist**. Keep this page — it's your record that Level 3 is genuinely done, not just watched. What's left isn't another lesson: it's reps, a reel, and the first job.