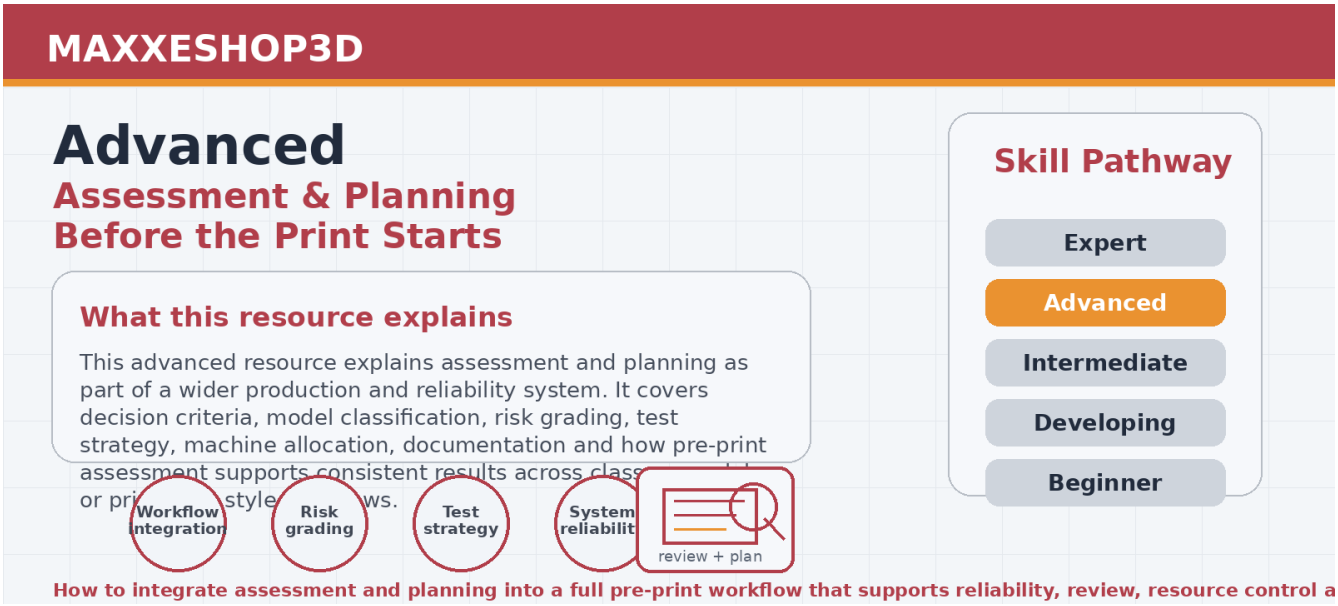


Advanced Level • Assessment & Planning

How to integrate assessment and planning into a full pre-print workflow that supports reliability, review, resource control and repeatable outcomes across many jobs.

This advanced resource explains assessment and planning as part of a wider production and reliability system. It covers decision criteria, model classification, risk grading, test strategy, machine allocation, documentation and how pre-print assessment supports consistent results across classrooms, labs or print-farm style workflows.

Resource overview

At advanced level, assessment and planning should operate as a formal pre-print workflow. The aim is not only to prepare one print well, but to improve how an entire workspace chooses, sequences and approves jobs. This includes how models are classified, how risks are recorded, when tests are required and how printer time is allocated.

A strong planning system improves good prints because it prevents unsuitable jobs, weak assumptions and poorly scoped runs from reaching the machine unchecked. It also creates better records for review, troubleshooting and future improvement.

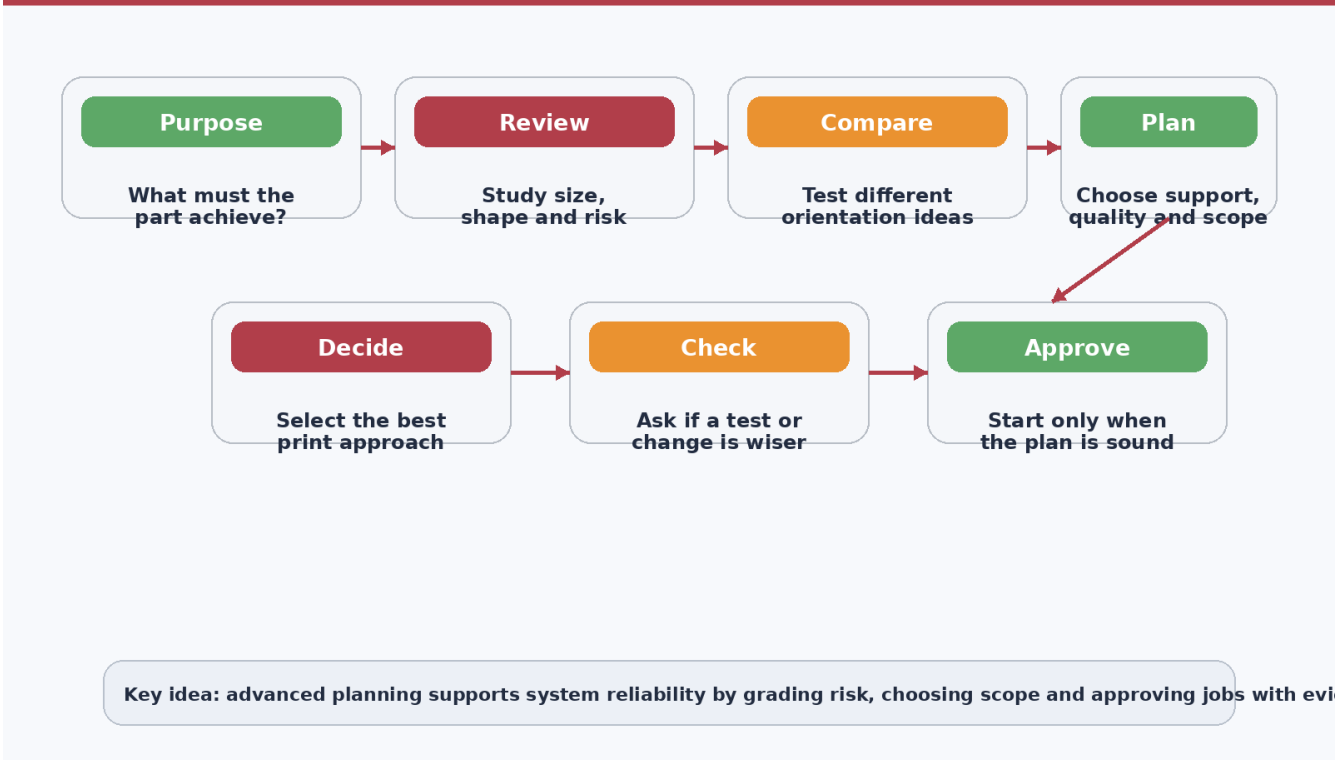
Indicative level	Advanced
Suggested use	Capstone classes, lab supervisors, technician pathways and multi-printer environments
Best suited to	Users managing many prints, many students or repeated workflows
Learning focus	Workflow design, approval discipline and planning for reliability at scale
Related resource areas	Expert setup • Documentation • Troubleshooting • Remote workflows

Why advanced planning belongs in the operating system, not just in the slicer

In advanced practice, pre-print assessment should be part of the workspace operating system. The decision about what to print, how to print it, whether to test it first and which machine should run it affects quality, uptime and resource use across the whole environment. When those decisions are inconsistent, printers become less reliable and troubleshooting becomes harder.

By embedding assessment into a shared workflow, teams can compare jobs more fairly, reject weak plans earlier and build a more dependable printing system over time.

Diagram 1 • Assessment and planning sequence for better prints



This diagram supports the advanced explanation by showing the main assessment and planning stages that should happen before a print begins.

Critical planning steps and why they matter

Activity area	What students do	Why it matters
Classify the job before slicing	Identify whether the print is decorative, functional, fit-critical, high-risk, low-risk, single-run or repeat production.	Classification helps determine how much planning, testing and documentation the print deserves.
Grade the risk, not just the model	Assess geometry, time, support burden, failure consequence and machine demand together.	Risk grading creates better go/no-go decisions and protects shared resources.
Choose a test strategy deliberately	Decide whether a coupon, small section, reduced scale or full test is required before production.	Test strategy catches weak assumptions early and reduces major failures.
Allocate the job intelligently	Match the print plan to the right machine, material and time window.	Planning improves when job choice and machine choice are considered together.
Use approval and documentation gates	Require evidence before the print enters the queue.	Approval discipline improves repeatability, accountability and review quality.

Step 1: Turn assessment into a shared pre-print workflow

Advanced environments benefit when assessment is not left to private judgement alone. Instead, the workspace should use a shared pre-print workflow that asks the same core questions of every job: what type of part is this, what outcomes matter most, what risks are present, what test strategy is appropriate and what evidence supports the final plan? This structure improves consistency between users and between prints.

A shared workflow also helps new or less experienced users make stronger decisions. Rather than guessing what to check, they work through an established planning path. Over time, that raises the overall quality of the workspace because good judgement becomes teachable and visible.

This step is taken because reliability at scale depends on systems, not only on individual skill. A good workflow makes strong planning more common and weak planning easier to catch.

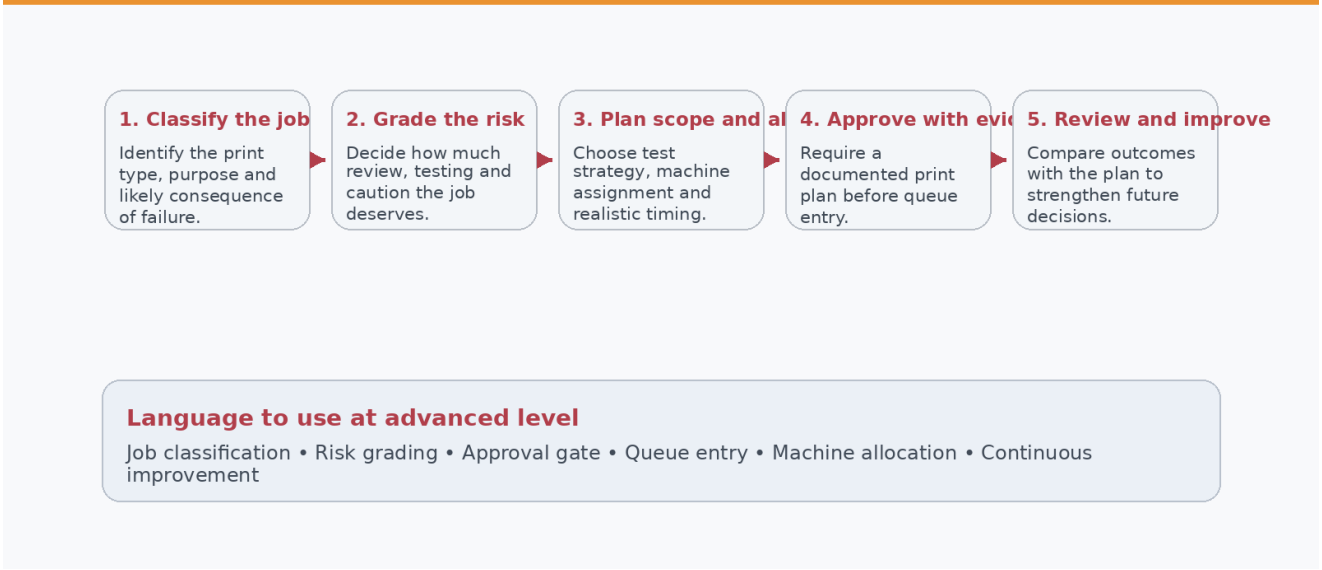
Step 2: Grade risk and scope so the right amount of caution is used

Not every print deserves the same level of planning effort. Some jobs are low-risk classroom demonstrations that can be approved quickly. Others are long, support-heavy, fit-critical or difficult to replace if they fail. Advanced planning should therefore grade risk and scope, so the amount of review matches the demands of the job.

This prevents two common problems: overplanning trivial prints and underplanning critical ones. By grading risk, the team can decide when a simple review is enough and when a test print, peer review or redesign is required before the machine is occupied for hours. This is especially important when multiple people depend on the same equipment.

This step is taken because planning quality improves when the level of scrutiny is proportional to the consequences of failure. Risk grading protects both print success and shared workflow efficiency.

Diagram 2 • Advanced assessment workflow



The workflow diagram above shows how assessment, comparison and final planning work together at advanced level.

Step 3: Use testing and machine allocation as part of the plan

Advanced planning should include decisions about scope and machine selection, not just part orientation. A tall high-risk part may deserve a short coupon test or reduced-scale prototype before full production. A critical print may be assigned to the most reliable machine or to a time window where supervision is possible. A less important job may be allocated differently.

These decisions matter because a good print plan exists in the real constraints of the workspace. A theoretically correct orientation still may not be the best operational choice if it ties up the wrong printer for too long or if a quick test would expose a weakness first. Strong planning includes those practical realities.

This step is taken because advanced printing is a systems activity. Matching jobs to the right stage and the right machine improves reliability across the whole workflow.

Step 4: Require approval evidence so planning can be reviewed and improved

A mature workflow should include an approval gate before a print enters the queue. That approval may be teacher-based, peer-reviewed or checklist-driven, but it should require evidence: identified criteria, chosen orientation, risk grade, support expectation, test decision and any unresolved concerns. This turns planning into a visible quality process.

Once evidence is recorded, the team can later compare the outcome against the plan. If the print succeeds, the workflow can note what worked. If it fails, the records help identify whether the original assumptions were wrong, whether the execution was poor, or whether the risk was known but accepted. This makes continuous improvement possible.

This step is taken because advanced practice values learning across many jobs, not just isolated success. Reviewable planning builds a stronger and more reliable printing environment over time.

Key planning reminders	Suggested classroom discussion
• Assessment should happen before settings are changed. • Orientation is a planning decision, not an accident. • Support, finish, strength and time often compete with each other. • A small test can save hours when risk is high.	• What does this model need to do once printed? • Which orientation best matches that purpose? • What risk would justify a test print or redesign first? • How would you explain the final plan to another operator?

Vocabulary focus

Job classification A category used to describe what kind of print is being planned and how important it is.	**Risk grading** A structured decision about how likely failure is and how serious the consequences would be.	**Approval gate** A required review point before the print is allowed to proceed.
Queue entry The stage at which a print is accepted into the production workflow.	**Machine allocation** Matching the job to the most suitable printer and time window.	**Continuous improvement** Using evidence from many prints to strengthen the planning system over time.

Why this level matters

Advanced users improve the whole printing environment because they turn planning into a repeatable system rather than a private guess. That raises consistency across many printers and many students.

This approach also supports long-term improvement. When print plans are reviewed against real outcomes, the team gets better at spotting risk and choosing the right job, machine and test strategy before printing starts.

Teacher extension prompt

Ask learners to design a shared pre-print approval sheet for the classroom. Then ask how that sheet would change the way jobs are classified, tested and allocated when printer time is limited.