

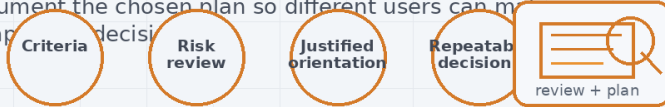
MAXXESHOP3D

Expert

Assessment & Planning Before the Print Starts

What this resource explains

This expert resource explains assessment and planning as a structured operating process. It covers print criteria, geometry risk review, orientation justification, strength and finish priorities, support impact, production realism and how to document the chosen plan so different users can make comparable decisions.



How to assess models systematically, plan prints against explicit criteria and turn pre-print thinking into a repeatable decision-making process.

Skill Pathway

Expert

Advanced

Intermediate

Developing

Beginner

Expert Level • Assessment & Planning

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Resource overview

At expert level, planning should be more than personal preference. The operator should assess the model against clear criteria and choose an approach that could be explained, reviewed and repeated by someone else. That is especially important in classrooms, labs and shared print environments where many users may handle similar jobs.

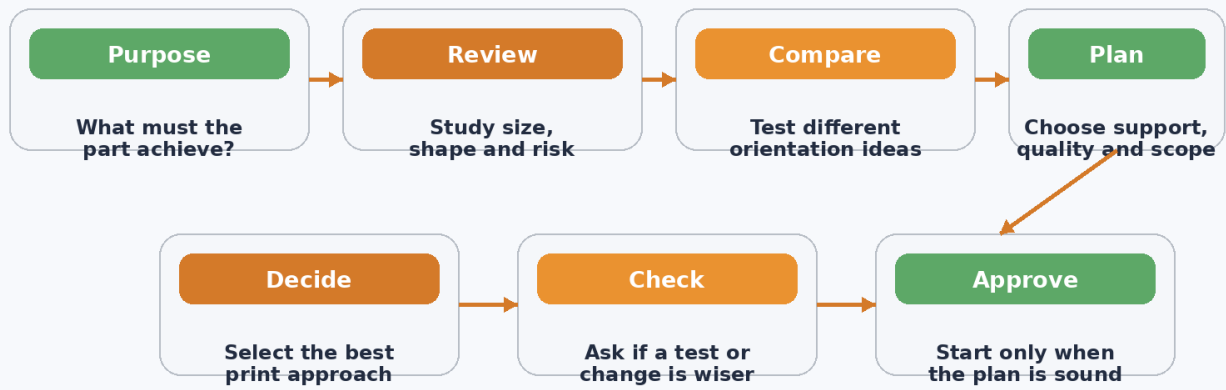
Assessment becomes a quality-control step because it prevents weak reasoning from reaching the printer. A strong planner identifies the model's demands, matches them to print priorities and records the logic behind the chosen approach.

Indicative level	Expert
Suggested use	Senior students, lab leads, print coordinators and advanced design classes
Best suited to	Users building repeatable print decisions across multiple projects
Learning focus	Criteria-based planning, justification and shared decision quality
Related resource areas	Troubleshooting • Documentation • Student Activities • Expert setup

Why expert planning needs explicit decision criteria

An expert user should be able to say what the print is being optimised for before the slicing choices are made. Is the priority strength, accuracy, appearance, speed, ease of cleanup, low support, classroom reliability, or something else? When those criteria are vague, the slicing choices become vague as well.

Explicit criteria turn print planning into a structured decision rather than an instinctive one. They also make it easier for others to review, challenge or improve the plan.

Diagram 1 • Assessment and planning sequence for better prints

Key idea: strong planning uses criteria, structured review and a justified final decision.

This diagram supports the expert 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
Set decision criteria before slicing	Define which outcomes matter most for the job and rank them if necessary.	Clear criteria prevent random decisions and make trade-offs easier to defend.
Review model risk systematically	Inspect the geometry for stability risk, support burden, weak regions and finish-sensitive surfaces.	Systematic review reduces the chance of missing a critical feature.
Justify orientation in writing or discussion	Explain why the chosen position is best against the criteria.	Justification improves repeatability and shared understanding between users.
Plan for production reality	Consider machine time, material use, likelihood of success and whether a test print is wiser than full scale.	Realistic planning protects time, resources and machine availability.
Document the decision for review	Record the selected plan and any unresolved risks.	Documented decisions support reflection, comparison and workflow quality.

Step 1: Define the criteria that will drive the print decision

Expert planning begins by deciding what the print is being optimised for. That may sound simple, but it is one of the strongest control points in the whole process. A part intended for demonstration may prioritise appearance and speed, while a functional component may prioritise strength and dimensional reliability. A classroom production run may prioritise consistency and ease of cleanup across many copies.

Without explicit criteria, users often make decisions that sound reasonable but are not tied to the real purpose of the job. They may rotate a model to reduce support even though strength was actually more important, or choose a visually attractive orientation even though the print is likely to detach. Criteria give the planning process direction.

This step is taken because strong print decisions should be led by goals, not by habit. Once criteria are clear, every later choice becomes easier to evaluate.

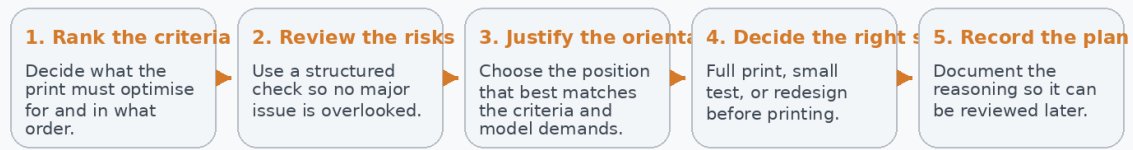
Step 2: Review the model against a structured risk framework

At expert level, the model should be reviewed through a repeatable risk framework. The operator considers bed contact, height and slenderness, support burden, critical surfaces, likely weak directions, internal features and expected cleanup difficulty. This avoids the common problem of focusing on one obvious risk while missing another that matters just as much.

A structured review also improves communication. Instead of saying a model 'looks tricky', the user can say why: the base contact is small, the support burden is high, the visible front face would be marked by support, or the loaded arm would sit across weak layer lines. This kind of reasoning is far more useful than vague judgement.

This step is taken because repeatable risk review produces better decisions and clearer handovers. It helps expert users compare different jobs using the same language and method.

Diagram 2 • Expert assessment workflow



Language to use at expert level

Decision criteria • Risk framework • Candidate orientation • Production realism • Test print • Justification record

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

Step 3: Choose and justify the orientation through the ranked criteria

By this stage, the user should compare candidate orientations against the criteria and risks already identified. The final choice should not simply be the lowest-support option or the most visually pleasing option. It should be the option that best satisfies the ranked priorities of the real job. Sometimes that will mean accepting extra support to protect strength. In other cases it may mean accepting a less optimal surface in order to gain bed stability and reliability.

Expert users should be comfortable defending this choice in clear terms. They might state that Orientation B was chosen because it gives broader bed contact, places layer lines more favourably for the loaded feature and keeps support off the critical fitting face, even though it increases total print time. That kind of statement shows disciplined planning.

This step is taken because justification transforms planning from an opinion into a quality decision. It creates a record that can later be reviewed against the outcome.

Step 4: Decide whether the full print should start, be tested smaller or be redesigned

An expert planner does not assume that every model should go straight to a full production print. Some parts deserve a smaller test piece, a reduced-height prototype, or even a redesign before the main print begins. This is especially true when the model is tall, support-heavy, time-intensive or dependent on a precise fit.

This decision is part of planning because it protects both resources and learning. A user who jumps immediately to the final print may spend hours discovering a problem that could have been found with a short test. In shared environments, this also affects printer availability for everyone else.

This step is taken because expert planning includes judgment about scope and timing, not just orientation. Starting the right print at the right stage is part of quality control.

Key planning reminders

- 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.

Suggested classroom discussion

- 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

<p>Decision criteria</p> <p>The ranked outcomes used to judge whether a print plan is good.</p>	<p>Risk framework</p> <p>A structured method for reviewing a model before printing.</p>	<p>Candidate orientation</p> <p>One of several possible ways the model could be positioned for printing.</p>
<p>Production realism</p> <p>Awareness of whether the planned print makes sense for time, material and machine use.</p>	<p>Test print</p> <p>A smaller or partial print used to check assumptions before full production.</p>	<p>Justification record</p> <p>A written or verbal explanation of why the chosen print plan was selected.</p>

Why this level matters

Expert users improve decision quality because they do not start prints on vague instinct. They work from clear criteria, structured risk review and documented reasoning.

This becomes especially powerful when multiple users share printers, because planning quality can be taught, compared and improved across the whole group.

Teacher extension prompt

Ask learners to build a short planning rubric for a functional part. Then have them explain how that rubric changes the orientation they choose and whether they would print full scale or test first.