

MAXXESHOP3D

Developing Assessment & Planning Before the Print Starts

What this resource explains

This developing resource explains pre-print planning in more detail, including the purpose of the part, bed fit, stable orientation, likely support needs, rough print time awareness and simple quality trade-offs. Students begin to connect planning choices with visible print results instead of treating slicing as an automatic step.



How to assess a model more deliberately, plan the print setup and connect pre-print decisions with likely print quality outcomes.

Skill Pathway

Expert

Advanced

Intermediate

Developing

Beginner

Developing Level • Assessment & Planning

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Resource overview

At developing level, students should start moving beyond a quick visual check and toward a simple planning routine. The model should be reviewed with purpose, orientation, support needs and likely print difficulty in mind. This strengthens the link between planning decisions and the final printed result.

Assessment matters because most slicer choices are really responses to the shape and purpose of the part. The better the student understands the model before slicing, the less likely they are to use random settings or hope the default choices will solve everything.

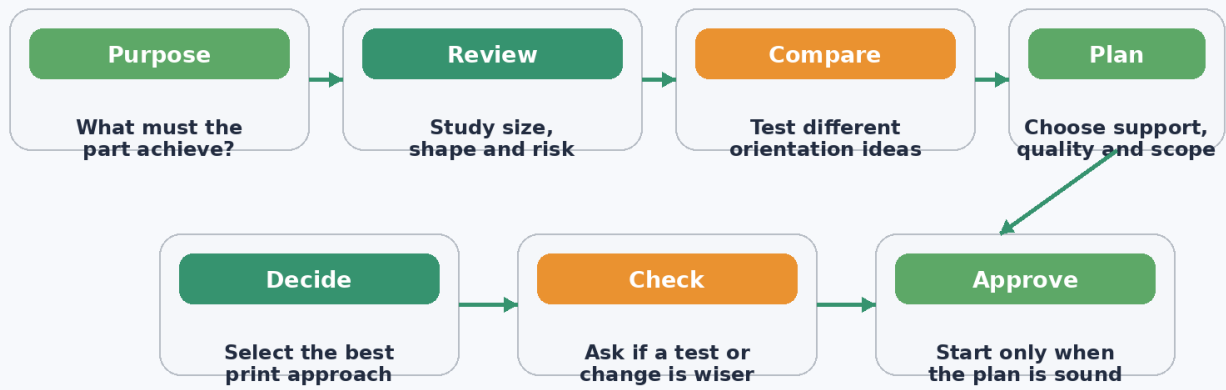
Indicative level	Developing
Suggested use	Students already running simple prints who need stronger judgement before slicing
Best suited to	Classrooms building repeatable print-planning habits
Learning focus	Purpose, support awareness, stability and simple quality planning
Related resource areas	Student Activities • What is 3D Printing • Loading Filament & First Extrusion Checks

Why good planning reduces guesswork in the slicer

Many new users open a model in the slicer and immediately start changing settings without first assessing the shape of the object. This often leads to confusion, because settings make more sense when the student already understands the part: where it is weak, where it may need support, and whether surface quality or strength matters most.

Planning therefore acts as the thinking stage before the settings stage. It helps students predict what the print will need instead of reacting randomly once the software is already open.

Diagram 1 • Assessment and planning sequence for better prints



Key idea: planning choices should come from the model's needs, not from random slicer changes.

This diagram supports the developing 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
Review the function of the part	Decide whether the print is mostly decorative, educational, display-based or functional.	Function influences how important strength, detail, finish and accuracy will be.
Compare orientation options	Look at more than one way the model could sit on the bed.	Different orientations change stability, support needs and visible surface quality.
Anticipate support demand	Estimate whether the model will need little, some or a lot of support.	This helps students plan for print success and cleanup effort before printing.
Consider print time and material use	Notice whether a large or tall model may take a long time or use a lot of filament.	Time and material planning help students choose realistic jobs and avoid waste.
Match settings to the plan	Use the assessment to guide simple quality and support decisions.	Planning gives reasons for settings, which improves consistency and learning.

Step 1: Assess the model with its purpose in mind

Developing students should begin every print plan by asking what kind of result is needed. A decorative item may prioritise appearance, while a classroom demonstration piece may prioritise speed and clarity. A functional part may need better strength, cleaner fitting surfaces or more careful orientation. These differences should be identified before slicing begins.

Thinking about purpose improves later decisions because it gives the print a clear goal. If the student knows the part will be handled often, they may think more carefully about how the layers will be arranged. If the part is mostly visual, they may think more carefully about which faces will be most visible once printed.

This step is taken because planning becomes easier when the desired outcome is known. Instead of choosing settings blindly, the student starts choosing them in relation to the job.

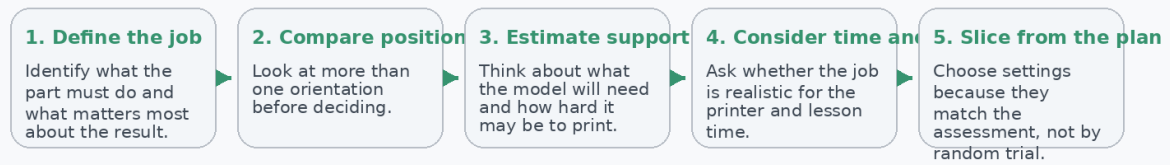
Step 2: Compare more than one orientation before deciding

At this level, students should not accept the first automatic orientation without thought. A model can often be printed in several different positions, and each position changes the print in important ways. One orientation may offer a larger contact area with the bed, while another may reduce support or improve the appearance of key surfaces.

Comparing orientations helps students understand that there is rarely one single 'correct' way to place a part. Instead, they learn to weigh stability, support, visible finish and likely strength. Even a simple rotate-and-compare habit can dramatically improve outcomes over time.

This step is taken because orientation is one of the strongest decisions in all of 3D printing. A better user learns to compare options before committing.

Diagram 2 • Developing assessment workflow



Language to use at developing level

Functional part • Surface finish • Support demand • Print difficulty • Trade-off • Planning routine

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

Step 3: Plan for support, cleanup and likely print difficulty

A developing planner should look at the model and estimate not only whether support may be needed, but what that support might mean afterward. Heavy support can increase print time, use more material and leave marks or cleanup work on the part. This does not mean support is bad; it means support should be used with awareness rather than surprise.

Students should also start describing prints in terms of difficulty. A broad low object with simple geometry may be low risk. A tall narrow part with multiple overhangs may be higher risk. This kind of language helps students prepare their expectations before the machine starts.

This step is taken because planning is stronger when it considers the whole job, not just the moment the print begins. Support demand and print difficulty affect time, cleanup and final quality.

Step 4: Let the assessment guide the slicing choices

By the end of the assessment stage, a student should have a reasoned idea of how the model should be sliced. They may decide the print needs a stable flat side down, some support, moderate detail and realistic time expectations. That is far better than choosing settings by guesswork or by copying whatever was used on the last unrelated print.

This step matters because the slicer should answer the plan, not replace the plan. Once students see that their settings choices come from the model's needs, they become more consistent and more able to explain their decisions.

The step is taken because learning improves when students can say why they chose a print approach. Thoughtful planning turns slicing into a meaningful process instead of a random one.

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>Functional part</p> <p>A print that must perform a job rather than simply look good.</p>	<p>Surface finish</p> <p>How smooth, neat or visually clean the printed outside appears.</p>	<p>Support demand</p> <p>How much extra support material a model is likely to require.</p>
<p>Print difficulty</p> <p>A judgement about how challenging the job may be to print successfully.</p>	<p>Trade-off</p> <p>A choice where improving one aspect may make another aspect less ideal.</p>	<p>Planning routine</p> <p>A repeatable way of checking a model before slicing and printing.</p>

Why this level matters

Developing users improve more quickly because their slicing choices start to come from model assessment rather than from copying settings blindly.

This leads to stronger, more predictable prints and helps students explain their thinking when a teacher or teammate asks why a choice was made.

Teacher extension prompt

Have students compare two orientations of the same part and explain which one they would choose. Ask them to justify the choice using stability, support and visible finish rather than personal preference alone.