FREECAD

2026

BLOG

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Learning Tutorials

A Note to Our Readers

2026

This blog has been created using a combination of artificial intelligence tools and human review to help deliver clear, structured, and up-to-date learning content.

All technical topics, examples, and workflows are curated to support learning and skill development. While every effort is made to ensure accuracy and clarity, readers are encouraged to validate concepts through hands-on practice and documentation. Our goal is to make learning more accessible, efficient, and practical for everyone.

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WHY SELECTION GATE IMPROVES SELECTION IN FREECAD

• LEARN • • APPLY • • GROW •

Introduction

In the world of 3D modeling and CAD design, software efficiency and accuracy are crucial. FreeCAD, an open-source parametric CAD tool, is widely appreciated for its flexibility and robust features. One feature that significantly enhances its usability—especially during complex part creation—is the selection gate. The selection gate in FreeCAD improves the selection process, ensuring more precise, efficient, and error-free modeling sessions. This comprehensive guide will delve into how the selection gate enhances selection in FreeCAD, offering step-by-step instructions, practical examples, and best practices to leverage this feature effectively.

What is the Selection Gate in FreeCAD?

The selection gate is a feature introduced to improve how users interact with objects within FreeCAD. At its core, it's a filtering tool that allows users to narrow down selectable entities based on specific criteria — such as shape type, object properties, or hierarchical level. By controlling what elements can be selected, the selection gate minimizes accidental selections and simplifies complex modeling tasks.

This feature is particularly vital when dealing with assemblies or intricate models containing multiple overlapping objects. Selecting the right component becomes quicker and more accurate. As such, the selection gate contributes to workflow efficiency, reduces errors, and improves the intuitive nature of the software.

How the Selection Gate Improves Selection in FreeCAD

The selection gate offers multiple benefits that streamline the modeling process—particularly in demanding projects where precision matters. Here's a detailed look at how this feature enhances selection in FreeCAD:

- **Reduces Ambiguity:** When multiple objects overlap or are close together, selecting the intended component can be challenging. The selection gate filters options, allowing users to specify exactly which element they want to manipulate.

- **Increases Efficiency:** Filtering options speed up the selection process, saving time during complex assemblies or detailed models.
- **Enhances Accuracy:** By limiting selectable entities, the selection gate reduces the risk of modifying the wrong part.
- **Simplifies Workflow in Assemblies:** When working on multi-component assemblies, controlling selection with gates prevents accidental selections of unrelated parts.

All these advantages translate to more productive modeling, fewer mistakes, and a smoother user experience in FreeCAD.

Step-by-step Guide to Using the Selection Gate in FreeCAD

Using the selection gate effectively requires understanding its setup and application. Here's how to do it:

1. Accessing the Selection Features

- Open your FreeCAD project.
- Switch to the **Part Design** or **Part** workbench as appropriate.
- Select the object or component in the model that requires refined selection.

2. Enabling and Configuring the Selection Gate

- Right-click on the object or a specific part of your model.
- Choose **Select** → **Selection Filter** from the context menu.
- The filter options will appear, allowing you to specify the type of entities you want to select (vertices, edges, faces, objects, shapes, etc.).

3. Applying Filters for Precise Selection

- Use the checkboxes to select the entity types relevant to your task.

- You can also select specific object properties, such as selecting only hidden objects, external shapes, or specific layers.

4. Using the Selection Gate During Modeling

- Once configured, click on objects within the 3D view or the model tree.
- The selection gate will restrict your selections according to your filters.
- If you want to change the filter, repeat steps 2–3 to modify the selection criteria.

5. Practical Example: Selecting Faces for Fillet or Chamfer

- To apply a fillet or chamfer to a specific face:
- Enable the face selection filter.
- Ensure only faces are selectable.
- Click precisely on the desired face, avoiding accidental selection of adjacent features.

6. Best Practices for Using the Selection Gate

- **Always set filters before starting specific operations**—this minimizes accidental selections.
- **Reset filters** after completing a task to re-enable all selection options.
- Use multiple filters in sequence when working with complex models.
- Save common filters for repetitive tasks.

Practical Examples of Selection Gate in Action

Consider a scenario involving a mechanical assembly with dozens of overlapping parts:

- Without the selection gate, selecting a single bolt or nut could be time-consuming and prone to errors.

- With the selection gate:
- Set the filter to only select objects of type "Mesh" or "Part."
- Restrict selection to specific layers or groups.
- Now, clicking on the assembly targets only the intended component, dramatically improving efficiency.

In another example, when editing a complex shell model, filtering vertices or edges reduces the chance of selecting the wrong geometric element. This precision supports tasks like creating features or applying modifications with confidence.

Common Mistakes and How to Avoid Them

Even with the selection gate, users may encounter some pitfalls. Here are typical mistakes and tips to avoid them:

- **Over-filtering:** Narrowing filters too much can make component selection impossible. Always verify your filter settings.
- **Forgetting to reset filters:** After completing an operation, reset filters to avoid unintentionally restricting future selections.
- **Ignoring hierarchical selection:** Sometimes, selecting at the object level is necessary before drilling down into sub-elements.
- **Assuming filters are static:** Remember to update filter settings as your project evolves and new selection needs arise.

Pro Tips and Best Practices for Leveraging the Selection Gate

- **Create custom filters** for frequently used selection scenarios.
- Use **keyboard shortcuts** to toggle filters quickly.

- Combine selection gate filters with **view filters** to hide irrelevant objects, further simplifying selection.
- Practice different filtering combinations to understand how they affect workflow.
- Keep your model organized into logical groups and layers for easier filtering.

Comparison: Selection Gate vs. Traditional Selection Methods

Aspect	Traditional Selection	Selection Gate in FreeCAD
Precision	Limited; prone to accidental selections	High; filters target specific entities
Efficiency	Can be slow in complex models	Faster; reduces unnecessary clicks

Error Rate	Higher, especially with overlapping objects	Lower; minimizes selection mistakes
Ease of Use	Basic, may require multiple attempts	Streamlined with preconfigured filters

This comparison highlights that the selection gate significantly enhances the modeling experience by providing precise and efficient selection control.

Conclusion

The selection gate is a powerful feature within FreeCAD that significantly improves the selection process, especially in complex models or assemblies. By allowing users to filter and target specific geometric entities or object properties, it reduces errors and speeds up workflow. Mastering its use involves understanding how to configure filters, applying them during key modeling steps, and avoiding common pitfalls. Whether you're designing detailed mechanical parts or intricate architectural models, the selection gate will become an invaluable tool, elevating your FreeCAD projects to the next level.

FAQ

1. How do I enable the selection gate in FreeCAD?

Ans : You activate the selection gate by right-clicking on your object or in the model tree, then choosing "Select" → "Selection Filter" and selecting the desired filters.

2. Can I save custom selection filters in FreeCAD?

Ans : Yes, you can create and save custom filters using macro scripts or by configuring and reusing specific filter settings for frequent tasks.

3. Is the selection gate available in all FreeCAD workbenches?

Ans : The selection gate features are primarily available in workbenches like Part Design and Part; some customization may be needed elsewhere.

4. How does the selection gate improve modeling accuracy?

Ans : By filtering selectable entities to only those relevant, it prevents accidental modification of unintended parts, ensuring precise edits.

5. Can the selection gate be used with external file imports?

Ans : Yes, it helps in managing selections within imported models, especially when dealing with complex or overlapping geometries.

6. What are some best practices when using the selection gate?

Ans : Always set relevant filters before a task, reset filters afterward, and organize your model into layers or groups for efficient filtering.

7. How does the selection gate compare to selection tools in other CAD programs?

Ans : It offers more granular filtering and precision than many CAD tools, making FreeCAD especially effective for detailed and complex models.

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2026

CADIN360 Learning Tutorials is an educational platform focused on practical CAD, CAM, and CAE learning.

The platform provides clear, industry-oriented tutorials, design workflows, and real-world insights using tools such as FREECAD.

CADIN360 is created to help learners, students, and professionals build strong fundamentals and practical design skills in modern CAD workflows.

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Practice What You've Learned

2026

You've just completed this blog and learned important concepts in FREECAD.

To help you practice and apply what you've learned, the next pages include a sample from our Freecad book .This sample contains practice exercises and real-world practice tasks designed to strengthen your skills.

What you'll find next:

- ✓ Practice exercises from the book
- ✓ A brief overview of the complete book
- ✓ Options to explore or request the full sample

Your hands-on Freecad practice starts next.

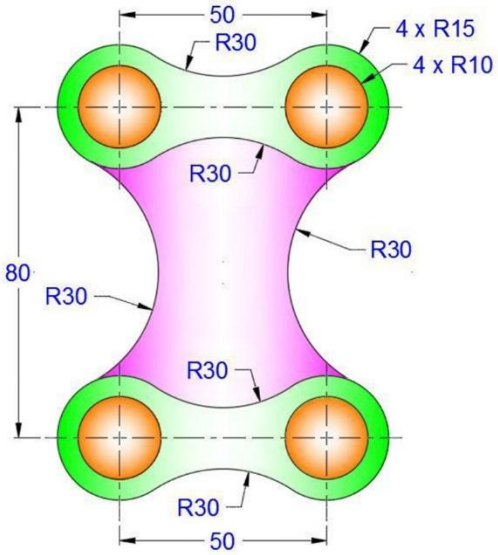
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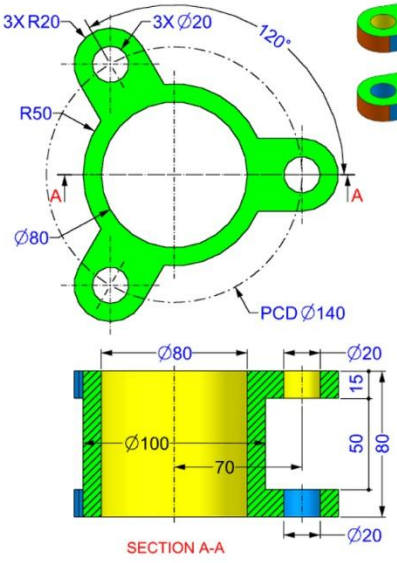
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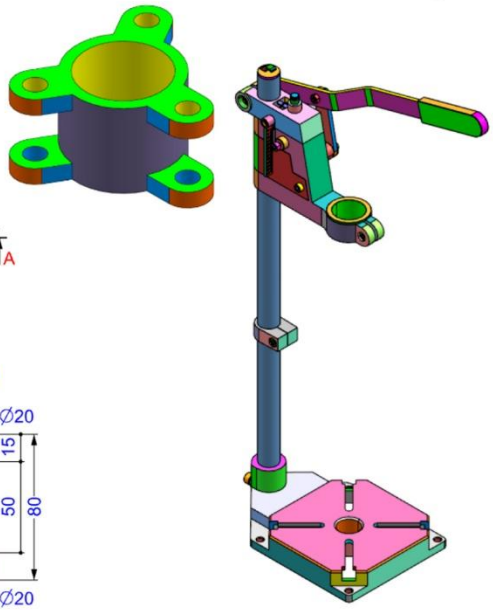
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This book contains over 500 carefully crafted practice drawings, including:

- 200 2D Sketching Exercises
- 200 3D Modeling Exercises
- Comprehensive Assembly Models with 150+ Individual Part Drawings

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Best regards,

Sachidanand Jha
Founder & CEO, CADIN360

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FREECAD ALL IN ONE WORKBOOK

- This book contains over 500 CAD practice exercises, organized as:

  1. 200 2D Sketching Exercises
  2. 200 3D Modeling Exercises
  3. Assembly Projects with 150+ Part Drawings

- This book is a practice workbook. It does not include step-by-step tutorials for creating 2D drawing, 3D models and Assembly.

- SI units (millimeters) are used for all dimensions.

- Third Angle Projection is used throughout this book.

- This book is for **FREECAD** and also suitable for Other Feature-Based Modeling Software such as SolidWorks, Catia, Fusion 360, NX, Solid Edge, AutoCAD, PTC Creo etc.

- Designed for students, engineers, drafters, and designers looking for extensive CAD practice using **FREECAD**.

- The exercises cover a wide range of real-world modeling challenges—from simple sketches to complex assemblies—offering clear, concise, and structured drawing practice.

- Exercises are organized to gradually develop beginner to advanced-level design skills.

- Each exercise is self-contained, and can be completed independently.

- Assembly drawings follow industry standards to help improve visualization and multi-part modeling skills.

- All dimensions are in mm. Assume missing dimensions logically.

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HOW TO USE THIS BOOK

This book contains over 500 CAD practice exercises, designed for self-paced learning using **FREECAD** or any feature-based modeling software.

- 2D Sketching Exercises: Start here if you're a beginner or learning how to use the sketch environment.

- 3D Modeling Exercises: Follow after mastering sketching. Practice creating solid models using the provided dimensions.

- Assembly Drawings: Use after completing part models to understand multi-part assemblies, relationships, and constraints.

Tips for Best Use:

- Complete the exercises in order, or jump to any skill level you prefer.
- All dimensions are in millimeters.
- Where dimensions are missing, apply logic or practice estimation.
- This book is ideal for both students and professionals preparing for industry design work.

Note:

This book is available in multiple formats – **Black & White**, **Standard Color**, and **Premium Color** editions.

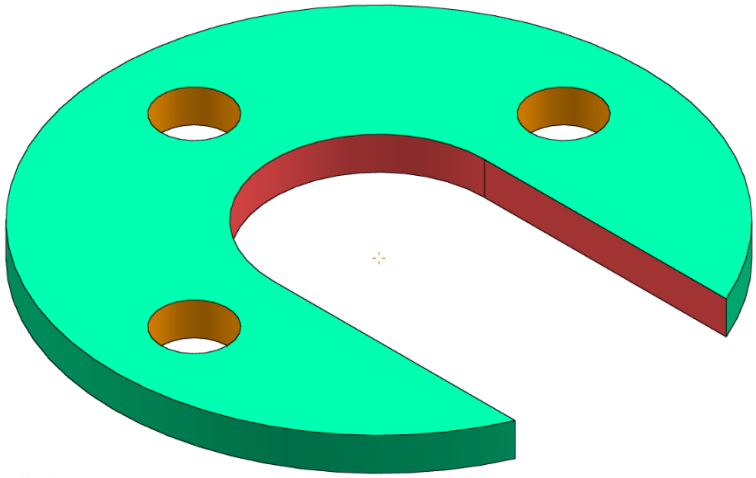
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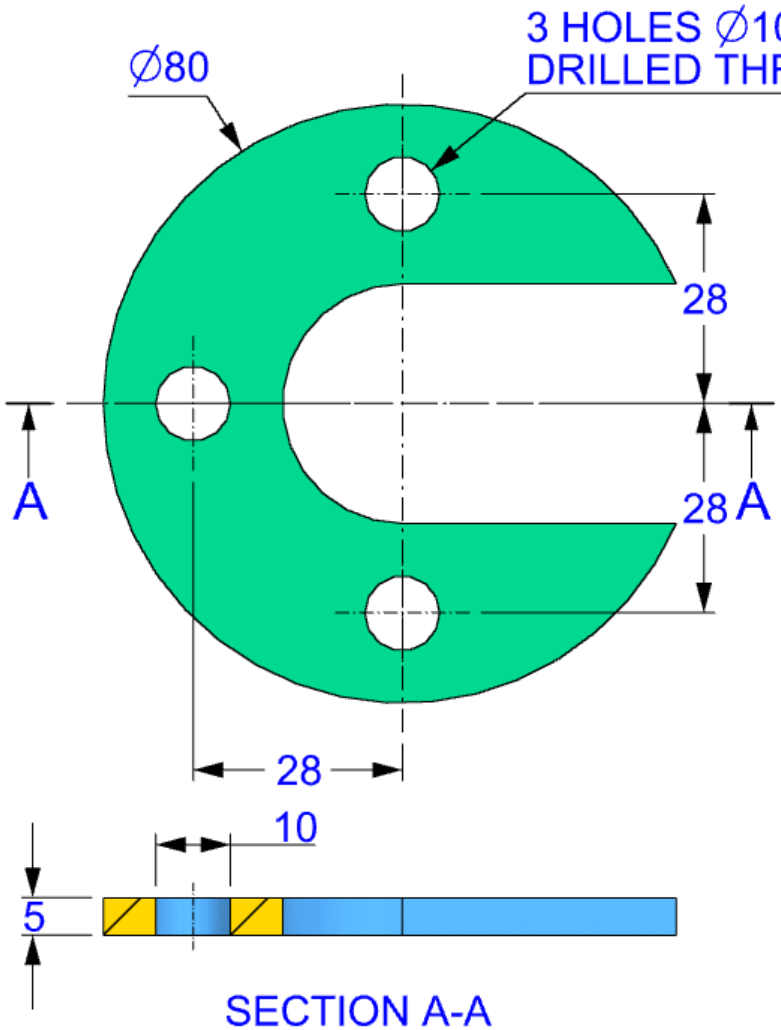
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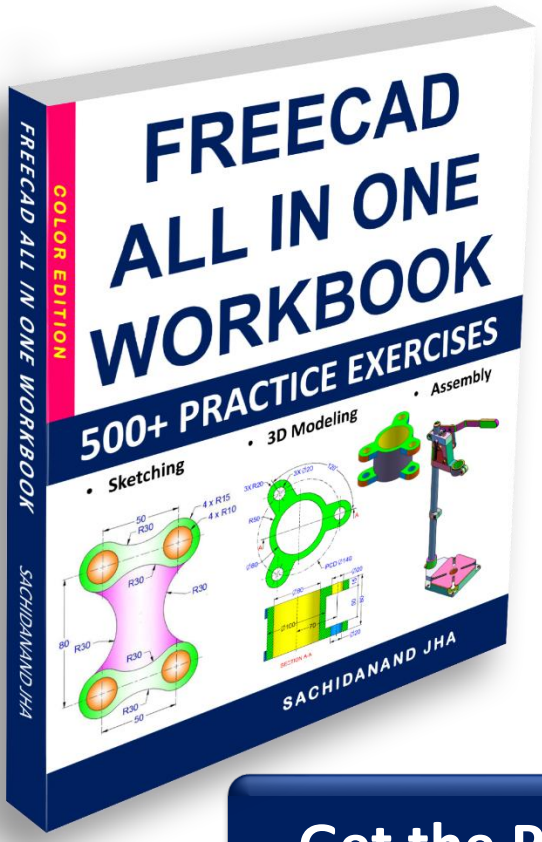
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- ✓ Full Assembly STEP Files (.stp format) – Compatible with all major CAD software
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Master FreeCAD with Real-World Practice Exercises

This book contains over 500 FreeCAD practice exercises including sketching, 3D modeling, and assembly drawings. Designed for students, engineers, and professionals to build practical CAD modeling skills.

FreeCAD ALL IN ONE WORKBOOK

This book contains:-

- 200 2D Sketching Exercises
- 200 3D Modeling Exercises
- Multi-part Assembly Exercises & Detailed Drawings
- All drawings in 3rd Angle projection
- All dimensions are in mm(metric system)