

Derived Parts - part 1

In This Exercise

This exercise provides concise, step-by-step, illustrated guidelines to help you become comfortable with creating, using, and modifying derived parts, and to better recognize when it might be to your advantage to use a derived part. We will use a derived part to create a mirrored, scaled copy of a simple example model.



Derived Parts Defined

A derived part is a feature that associatively and selectively copies various entities from a different part to the derived part. A derived assembly is a feature that associatively and selectively copies the bodies of parts or assemblies within an assembly to the derived part, and then joins or subtracts those parts or assemblies. The derived part is a featureless solid body that you can modify in various ways.

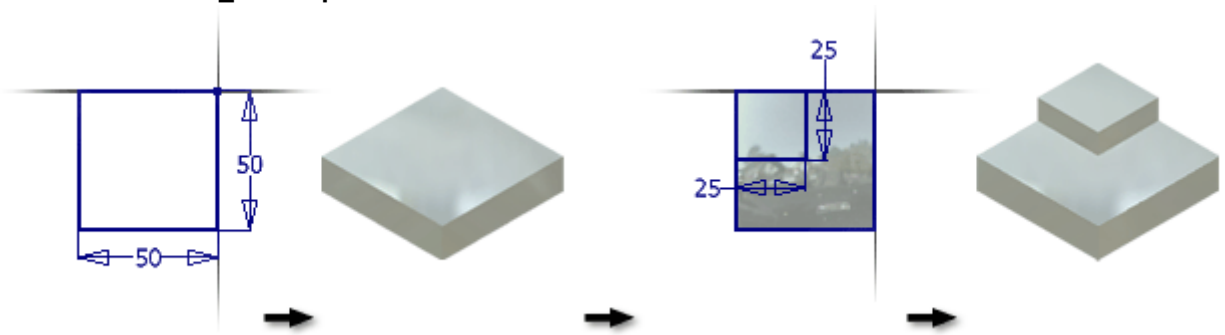
There are many ways to apply derived parts to your designs. You can use derived parts to create a scaled derivation of a part, create mirrored derivations of parts, convert a solid to a surface, or to export specific design data from one part to another in order to reuse data in an associative way. You can use a derived assembly to perform Boolean operations of union and subtraction between parts or between assemblies.



Create a Derived Part

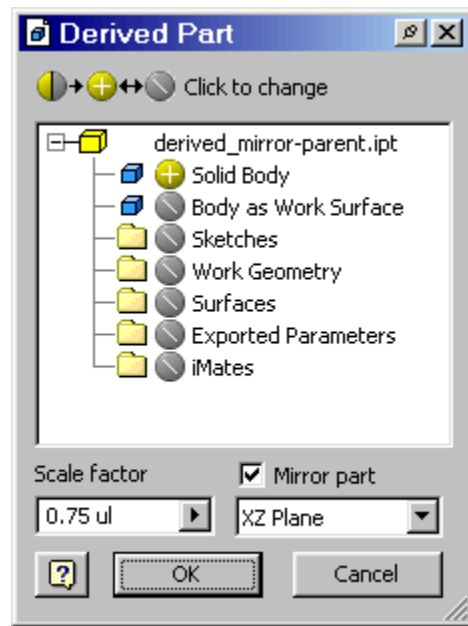
Tip: Consider creating a project to easily access the parts associated with this exercise.

1. Start Autodesk Inventor.
2. Create a part using the sketch profiles, dimensions, and extrusions shown in the following illustration. Ensure that the upper right point of the first sketch profile is located at sketch coordinates 0,0. The depth

of the base extrusion is 12 mm. The depth of the second extrusion is 8 mm. Save the part and use the name **derived_mirror-parent**.



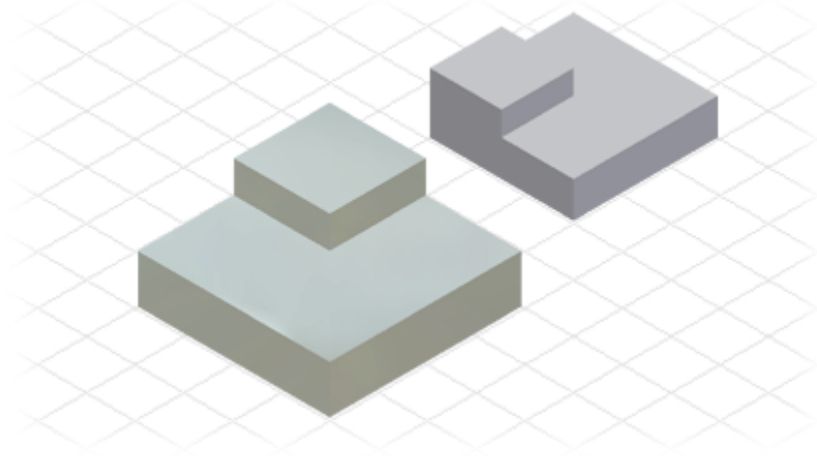
3. Start another new part.
4. Click the Return button to exit the blank sketch.
5. Click the Derived Components button on the Part Features panel bar.
6. Browse to and select **derived_mirror-parent.ipt**.
7. In the Derived Part dialog box, ensure that the Include icon  appears next to Solid Body. Ensure that the Exclude icon  appears next to the remaining derived elements (click the icon to switch to the next icon). Set the scale factor to 0.75. Select the Mirror part check box, and select XZ Plane from the drop-down list. Click OK.



8. Save the part and use the name **derived_mirror-child**.

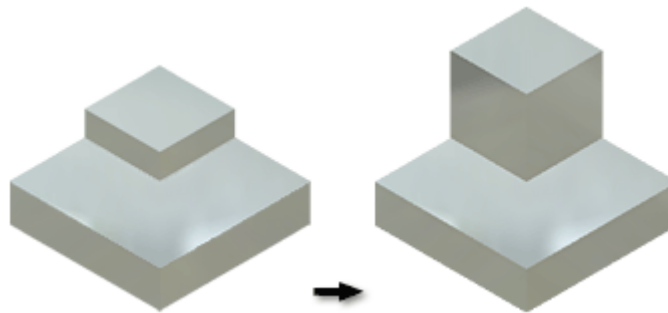
Let's create an assembly to compare the two parts side-by-side.

9. Create a new assembly and add one instance each of **derived_mirror-parent.ipt** and **derived_mirror-child.ipt**.



Notice that *derived_mirror-child.ipt* is indeed scaled to 75% and mirrored about the XZ plane.

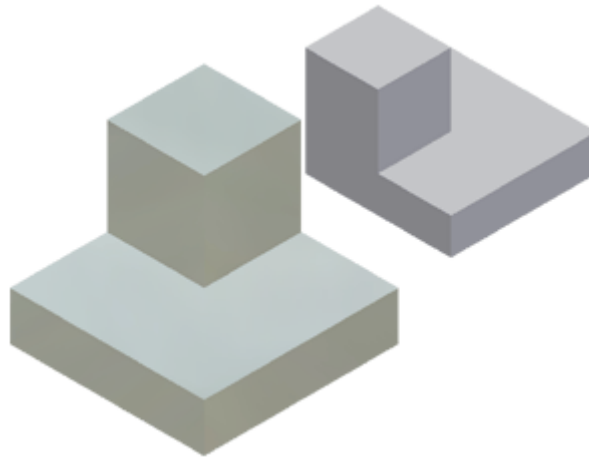
10. Return focus to **derived_mirror-parent.ipt**. Change the extrusion depth of the smaller profile to 25 mm.



11. Return focus to *derived_mirror-child.ipt*.

Notice the red lightning bolt icon in the browser next to *derived_mirror-parent.ipt*. This indicates the parent component has changed and that, if you want to apply the changes to *derived_mirror-child.ipt*, you must click the Update button on the main toolbar. Notice also that it is not necessary to save *derived_mirror-parent.ipt* to alert *derived_mirror-child.ipt* of the change.

12. Click the Update button.

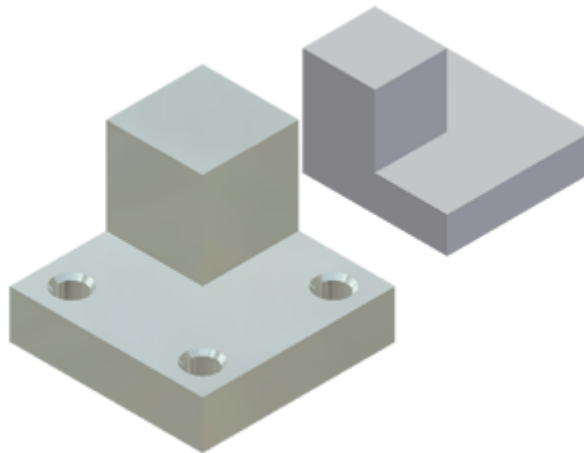


This associativity flows in one direction only. Any change to the parent affects the derived part but the derived part can be modified without affecting the parent or any other parts derived from that parent.

There may be times when you need to modify the parent part without affecting a particular derived part. To do so, you can break the link between the parent and derived part.

13. Return focus to **derived_mirror-child.ipt**.

14. In the browser, right-click **derived_mirror-parent.ipt**, and then select Break Link With Base Part.



Notice that any further changes to **derived_mirror-parent.ipt** are not reflected in **derived_mirror-child1.ipt**. Keep in mind that once the link has been broken it cannot be restored.

Take a look at Derived Parts - parts 2 and 3 for more uses for derived parts.