

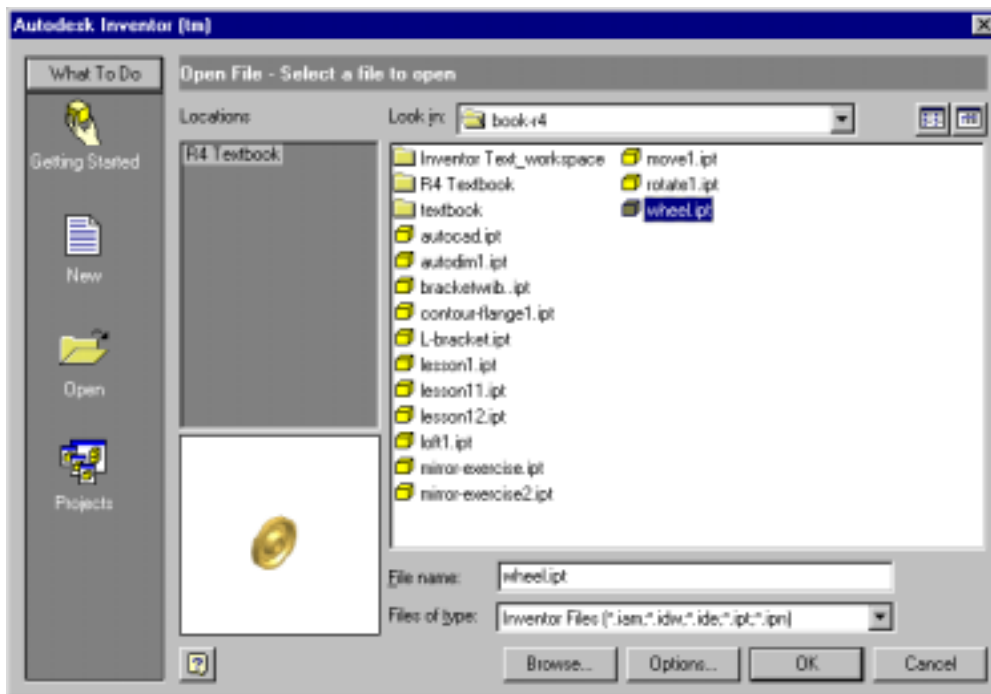
Lesson 13

Patterns

Learning Objectives

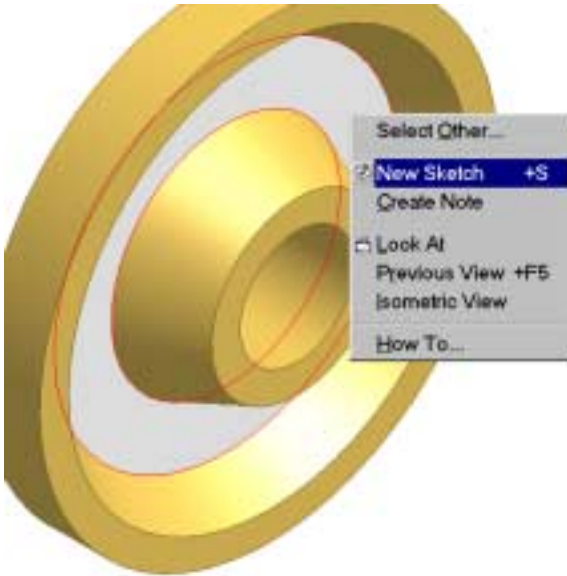
At the conclusion of this lesson, the user will be familiar with:

- ◆ Creating Circular Patterns
- ◆ Creating Rectangular Patterns
- ◆ Modifying Patterns
- ◆ Managing Occurrences

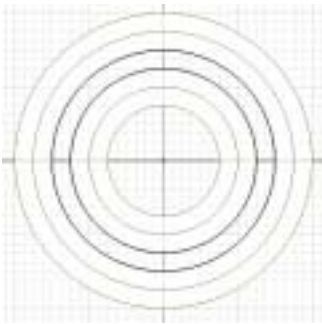


Select File->Open and locate the 'wheel.ipt' file.

In this lesson we will modify the 'wheel.ipt' and create a circular pattern of bolt holes.

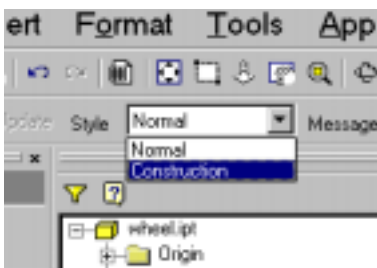


Highlight the inner plane shown. Right-click and select 'New Sketch'.

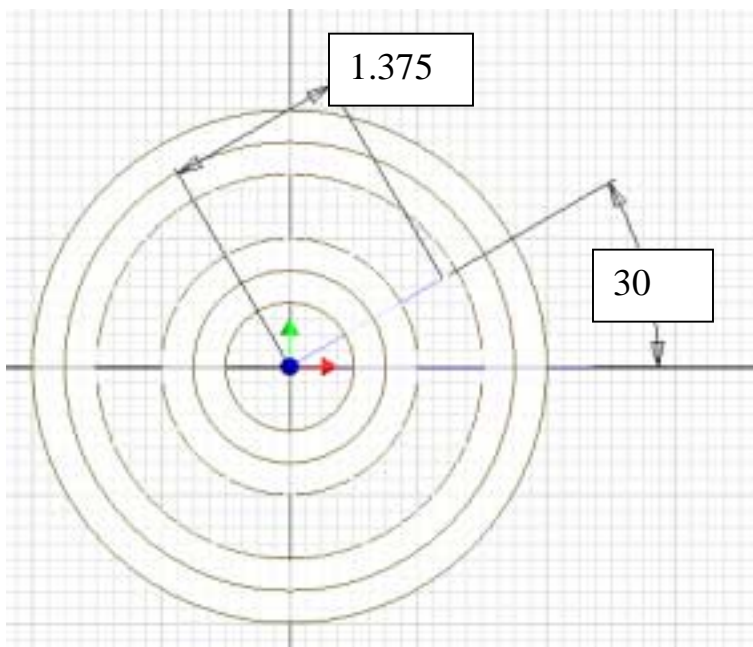


Use the Look At tool to switch to a Plan View.

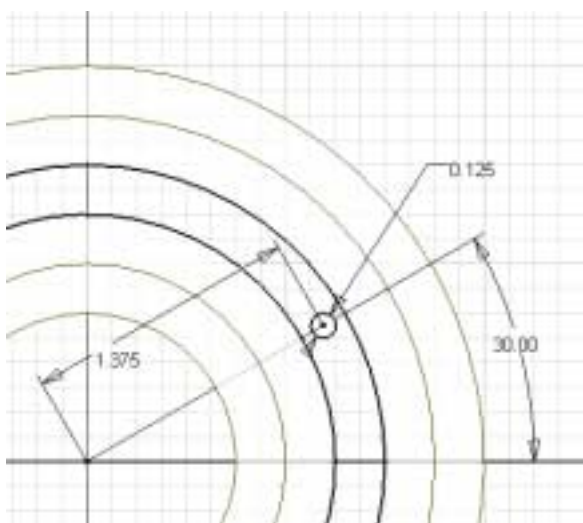
In a part like this, it can be difficult to figure out which plane we want to sketch on. Inventor assists us by darkening the lines of the object to reveal our target plane.



Select 'Construction' under Style and draw a horizontal and angled line as shown.

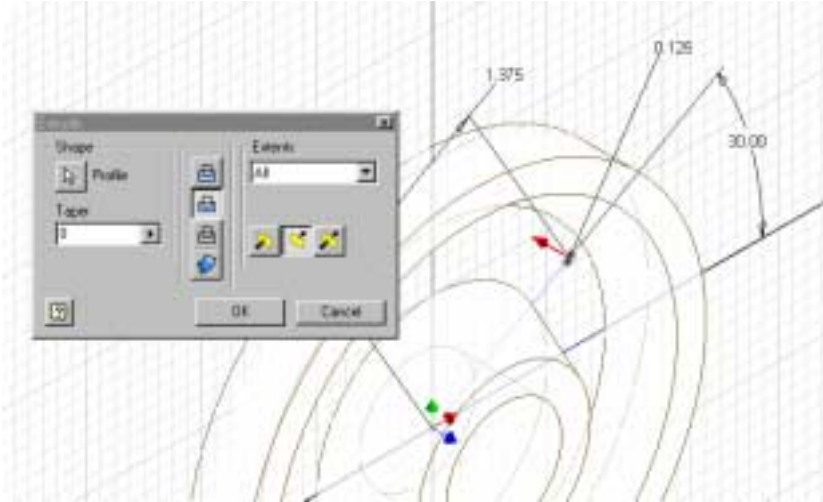


Switch to 'Normal' Style and add a 0.125 diameter circle at the endpoint of the angled line.



Note that the angled line and the horizontal line are both part of the sketch. These are used to locate the circle.

Right-click to select 'Done' and repeat to select 'Isometric View'.



Select the 'Extrude' icon.

Verify that the circle is the profile selected. If it is not, use the Profile Select tool to select the correct profile.

Use the left mouse button to pick the 'Cut' option of the Extrude dialog box.

Set 'Extents' to All.

Once everything is set up properly, press 'OK'.



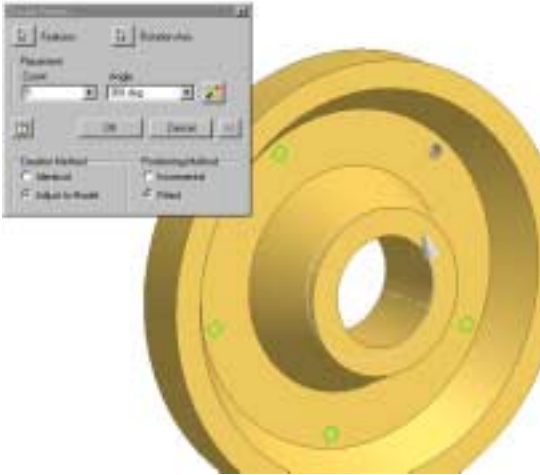
Our wheel with the hole correctly made.

Now we are ready to array the hole.



Circular Pattern

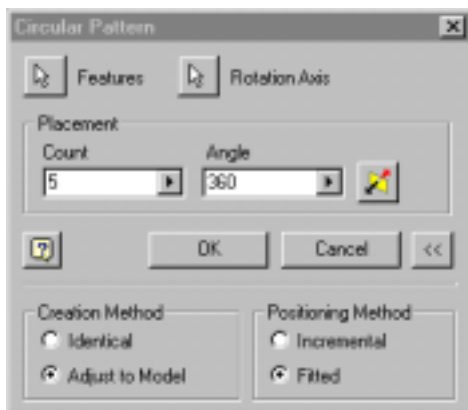
Select the Circular Pattern tool located in the Features toolbar.



With the Features button depressed, select the hole we just made. The hole may be selected in the browser or in the graphics window. It will highlight to indicate it was selected properly.

We must now select a rotation axis. Depress the Rotation Axis button and select the center cylinder. It will highlight when selected.

Modify the dialog box to show a count of 5 and an angle of 360 as shown. Note that we can change the direction of the array by pressing on the direction icon.



Pressing the double arrow button enlarges the dialog box to reveal some additional options. Enable 'Fitted' and 'Adjust to Model'.

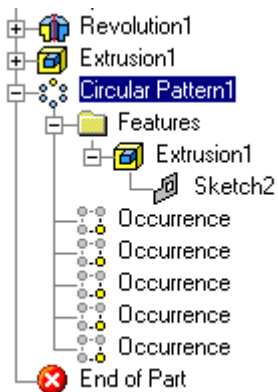
Then, press 'OK'.



TIP: To create a pattern by specifying an angle between entities, specify an angle in the angle edit box and enable the Incremental Positioning Method.



Use the Orbit tool to rotate our model so we can see the effects of the array.



Note that the circular pattern is listed in the browser.

Modifying a circular pattern



Highlight the circular pattern in the browser, right click and select 'Edit Circular Pattern.'



Change the count from 5 to 6. Press 'OK'
Note that the pattern automatically updates.



TIP: Inventor R3 allows you to suppress an occurrence individually. You can suppress all occurrences by suppressing the circular pattern.

Inventor R4 and below does not allow the user to transform individual occurrences into independent features.

Save Copy As 'Array1.ipt'.

Review Questions

1. Each individual member of a pattern is referred to as a(n):
 - A. Member
 - B. Occurrence
 - C. Item
 - D. Child
2. To make a pattern invisible:
 - A. Locate it in the browser, right click and select 'Suppress'.
 - B. Locate it in the browser, right click and select 'Delete'.
 - C. Locate it in the graphics window, right click and select 'Suppress'.
 - D. Locate it in the graphics window, right click and select 'Delete'.
3. When creating a circular pattern, the user must identify all of the items listed below EXCEPT:
 - A. The feature to be patterned
 - B. The angle between the features to be patterned
 - C. An axis of rotation
 - D. The total number of items in the pattern
4. To modify a pattern:
 - A. Highlight the pattern in the browser or graphics window, right click and select 'Modify'
 - B. Highlight the pattern in the browser or graphics window, right click and select 'Edit Feature'
 - C. From the menu, select Modify->Pattern
 - D. From the Features toolbar, select 'Pattern Edit'.
5. True or False

To specify a pattern using the angle between entities rather than a total angle, enable Incremental Positioning and specify an incremental angle.

6. True or False

Inventor R4 will not allow the user to make a member of a pattern into an independent feature.

7. True or False

If you suppress a circular pattern, all members of that pattern will also be suppressed.

ANSWERS: 1) B; 2) A; 3) B; 4) B; 5) T; 6) T; 7) T