CHAPTER 3

THE DEVELOPMENT ENVIRONMENT

The Oracle Forms development environment is a simple one to navigate. The three main tools within in it are designed to make development intuitive and easy. The Exercises and Labs in this Chapter will walk you through the basic ins and outs of the Object Navigator, Property Palette, and Layout Editor. Along the way you will also learn more about how to configure the mandatory Forms objects that you learned about in Chapter 1, "Concepts and Objects."

Some of the Exercises in this Chapter may seem elementary if you already have experience with a graphical development tool. You should still complete the Chapter since it will teach you many features and functions that are specific to the Form Builder and that may not be in the other tools to which you are accustomed.

Chapters 1, 2, and 3 are meant to prepare you for the more complicated and interesting lessons that lay ahead.

65

L A B   3 . 1

THE OBJECT NAVIGATOR

### LAB OBJECTIVES

After this Lab, you will be able to:

- Open and Identify Objects
- Create and Delete Objects
- Drag & Drop and Cut & Paste Objects
- Run and Save Forms
- View Database Objects

In the preceding Chapters, you learned about the fundamentals of Forms behavior and Forms objects, as well as how to create simple forms with the help of wizards. In doing so, you were exposed to the Object Navigator. In this Lab, you will take what you have learned about objects and apply it to working with those objects in the Object Navigator.

The Object Navigator gives you a hierarchical view of all the objects in a form. It organizes these objects by *node* and lets you *expand* or *collapse* nodes to view objects.

Within the Object Navigator, you can create, delete, move, and manipulate objects in other ways. You can name an object in the Object Navigator, but you cannot define it any further. To adjust the specific characteristics of an object, you must use the Property Palette or Layout Editor, which are discussed later in the Chapter.

Figure 3.1 shows a screenshot of a single form open in the Object Navigator.
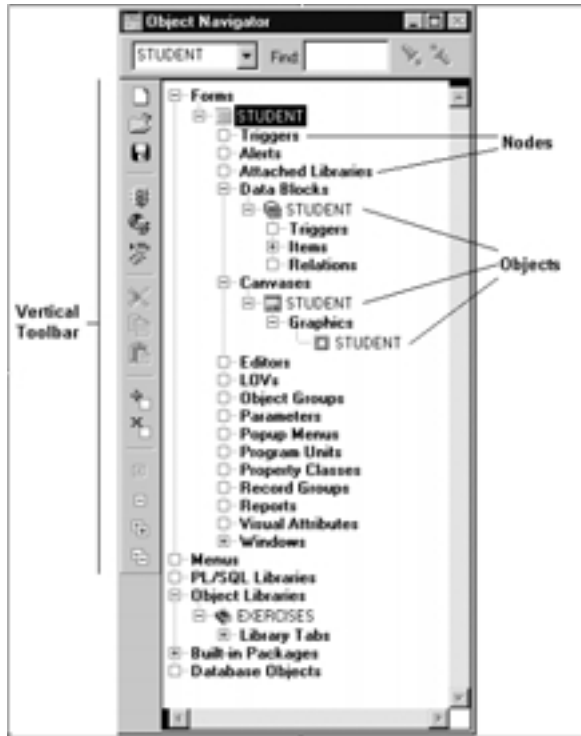
Figure 3.1 ■ The Object Navigator with nodes expanded to show `Data Blocks` and `Canvases`.

Along the left-hand side is the vertical toolbar, and in the center is the hierarchy itself. Note that the `Data Blocks` and `Canvases` nodes are expanded to reveal their objects. Also note that below both the `Data Blocks` and `Canvases` nodes there are sub-nodes that are collapsed.

In this Lab's Exercises, you will be exposed to copying and moving objects from node to node and even from form to form within the Object Navigator. This powerful feature paves the way for object reusability, which you will learn about in later Chapters.

You may have noticed that `Forms` is not alone as the highest node in the hierarchy. At the bottom there are five other nodes: `Menus`, `PL/SQL Libraries`, `Object Libraries`, `Built-ins`, and `Database Objects`, which are also at the top level of the hierarchy. In this Lab's Exercises, you will experiment with the `Database Objects` node only, but the rest will come in later Chapters.

As you would expect, the Database Objects node lets you view and in some cases edit database objects.

The Object Navigator is an extremely friendly tool and does not need much explanation. You will be able to complete the Exercises by simply exploring it on your own.

Many of the Exercises ask you to click a specific button on the toolbar. The buttons have icons that indicate their function. However, if the meaning of an icon is not clear, note that all of the buttons have Tool Tips to further explain their purposes.

LAB 3.1 EXERCISES

3.1.1 OPEN AND IDENTIFY OBJECTS

Open the Form Builder, but close all Forms modules.

Use a button on the Object Navigator's toolbar to open EX03_01.fmb.

a) Which button did you use to open EX03_01.fmb?

_____

_____

b) Does this form have any alerts? How about LOVs? How could you tell without even touching the mouse or keyboard?

_____

_____

Use the expand and collapse buttons on the Object Navigator's **vertical tool-bar** to answer Questions c–g

c) How many blocks does this form have?

_____

_____

d) Are there any block-level triggers? Name them.

e) Do both blocks have items?

f) Are there any item-level triggers? Name them.

In the top left-hand corner of the Object Navigator window there is a Find feature. Use this to find the object QUERY_MASTER_DETAILS.

g) What kind of object is it?

3.1.2   CREATE AND DELETE OBJECTS

Open form EX03_01.fmb in the Form Builder.

Use the buttons on the Object Navigator's toolbar to complete the tasks in this Exercise. If you have not already done so, familiarize yourself with all of the buttons in the toolbar by reading their Tool Tips.

Create an alert and change its name to NEW_ALERT.

a) What did you have to do to change the alert's name?

b) How can you create a block **manually?** Change its name to CONTROL.

_____

_____

Create two items in the CONTROL block. Name one SAVE and the other EXIT. Select Tools | Property Palette from the Main Menu to open the Property Palette. Change the Item Type property of the SAVE and EXIT items to Push Button.

c) Why can't you see these buttons in the Layout Editor?

_____

_____

Delete NEW_ALERT.

d) Which button did you use to delete it?

_____

_____

3.1.3 DRAG & DROP AND CUT & PASTE OBJECTS

Open form EX03_01.fmb in the Form Builder as in the previous two Exercises.

Drag the button CONTROL.SAVE to the INSTRUCTOR block. Position it after the INSTRUCTOR.ZIP item.

a) How did the Object Navigator indicate that you were positioning CONTROL.SAVE after INSTRUCTOR.ZIP?

_____

_____

Using the buttons on the Object Navigator's vertical toolbar, copy the button CONTROL.EXIT to the SECTION block. Position it after the SECTION.CA-PACITY item.

go to contents

b) Which buttons did you use and how were you able to position the button item properly this time?

_____

_____

Leave EX03_01.fmb open, and then open form EX03_03.fmb. You will be working with both of them.

Drag the following objects from EX03_01.fmb to EX03_03.fmb:
   Form Trigger - WHEN-NEW-FORM-INSTANCE.
   Alert - DEMO_OBJECTS.
   Program Unit - DEMO_ALERT.

If you have trouble locating any of these objects, use the Object Navigator's Find feature.

c) What happened as you tried to drag these objects from one form to the other?

_____

_____

d) What do you think the relationship will be between the objects in EX03_01.fmb and EX03_03.fmb if you choose Subclass?

_____

_____

e) What if you choose Copy?

_____

_____

Choose Copy for each object. If you already chose Subclass, simply delete all of the objects you dragged into EX03_03.fmb. Drag them over again, but this time choose Copy. Keep form EX03_03.fmb open for the next Exercise.

go to contents

3.1.4 RUN AND SAVE FORMS

The purpose of this Exercise is to run a form from the Form Builder. You will also check that the objects from EX03_01.fmb in the previous Exercise were dragged over successfully.

Using the buttons in the Object Navigator's vertical toolbar, run the form EX03_03.fmb in Client/Server mode. Note the horrible layout. You will be fixing it in Exercise 3.3.1.

> **a)** Which button did you choose to run EX03_03.fmb ?

> **b)** What message did you receive when you ran this form?

Use the buttons on the Object Navigator's vertical toolbar to save the changes to the form. Make sure you save it to the \guest\forms\exercises directory.

3.1.5 VIEW DATABASE OBJECTS

Open the Form Builder. It is not necessary to have any forms open, but it will not hurt if you do. Make sure you are connected to the database. If you are unsure, reconnect from the Main Menu by selecting File | Connect.

Open and view the STUDENT schema under the Database Objects node.

> **a)** What types of objects are visible to you? (Give the object types like Synonyms, Rollback Segments, and so forth.)

> **b)** Can you rename the STUDENT table to ST_STUDENTS?

c) Can you add columns to the STUDENT table?

_____

_____

d) Does the STUDENT table have any triggers?

_____

_____

e) Are you able to create and edit database triggers?

_____

_____

LAB 3.1 EXERCISE ANSWERS

3.1.1 ANSWERS

a) Which button did you use to open EX03_01.fmb?

Answer: You should use the Open *button and navigate the filesystem to find* EX03_01.fmb. *The* Open *button has a small file folder as its icon.*

You could also have opened the form by going to the Main Menu and selecting File | Open. As in most Windows-based applications, both methods have the same outcome.

b) Does this form have any alerts? How about LOVs? How could you tell without even touching the mouse or keyboard?

Answer: Yes, this form does have some alerts, but it does not have any LOVs. You can tell because there is a small plus sign (+) to the left of the Alerts *node, but only an empty box next to the* LOVs *node.*

This is nearly identical to the interface for the Windows 95/98/NT Explorer or File Manager and should be very familiar to you.

c) How many blocks does this form have?

Answer: This form has two blocks.

If you had trouble with this, take the following steps:

1) Select the Data Blocks node.

2) Click the Expand button on the Object Navigator's toolbar. The Expand button has a single black plus sign as its icon.

Of course, you could have done this by simply clicking the small plus sign to the left of the Data Blocks node. Or, you could have even double-clicked the text of the node. However, it is good to become familiar with all of the GUI features of the Object Navigator and Form Builder.

d) Are there any block-level triggers? Name them.

Answer: Yes, there are three block-level triggers: POST-QUERY, ON-POPULATE-DETAILS, *and* ON-CHECK-DELETE-MASTER.

If you had trouble with this, take the following steps:

1) Select the Data Blocks node.
2) Click the Expand All button on the Object Navigator's toolbar. The Expand All button has two black plus signs as its icon.

In this case, it is best to use the Object Navigator's toolbar buttons instead of going straight for the node or the objects themselves. The Expand All button expands all of the blocks and all of the items as well, giving you a complete view. In this case, it lets you answer the question in two steps instead of three, four, or maybe more.

e) Do both blocks have items?

Answer: Yes, they both have items. If you used the Expand All *button as described in 3.2.2.d, you would not have had to take any steps to find this out.*

f) Are there any item-level triggers? Name them.

Answer: No, there are no item-level triggers. If you used the Expand All *button as described in 3.2.2.d, you would not have had to take any steps to find this out.*

You may have been skeptical about the value of Expand All in Exercise 3.2.2.d. One click, two clicks, what's the difference? Here, the value of Expand All should be quite clear. There will often be times when you will want to see all of the trigger objects for all of your items. To click through each item individually would be tedious and annoying.

While Expand All is convenient, it can also make the Object Navigator a bit messy. Luckily there are two other buttons, Collapse and Collapse All, on the Object Navigator that reduce what has been expanded to make the Navigator more readable.

g) What kind of object is it?

Answer: QUERY_MASTER_DETAILS *is a Program Unit.*

If you had trouble with this, take the following steps:

1) Position the cursor in the `Find` text field, which is in the top right-hand corner of the Object Navigator.
2) Start typing `QUER` … You don't have to type the whole thing. In fact, it should have been found after you typed the first character. The Form Builder will automatically begin searching as soon you begin typing.

The Find feature is helpful as your forms get more involved, and it is especially helpful for finding triggers.

3.1.2 ANSWERS

Create an alert and change its name to NEW_ALERT.

a) What did you have to do to change the alert's name?

Answer: To change the name of an object in the Object Navigator, you have to first select it, then click it again to put it into an editable mode.

This is a rather simple concept, but it does deserve some discussion for it can lead to some frustration if you are a beginner. There are three states for objects in the Navigator: deselected, selected, and name-editable. Again, this follows the same behavior as the Windows 95/98/NT Explorer.

In this Exercise, you are focusing on the Object Navigator. Later on, you will learn how you could have changed the object name in the Property Palette instead. Both achieve the same result; the one you choose depends on where you are in the Form Builder at the time, or which method you prefer.

If you had trouble with this, take the following steps:

1) Select the `Alerts` node in the Object Navigator.
2) Click the `Create` button on the Object Navigator's toolbar. The `Create` button has a large green plus sign (+) as its icon.
3) Select the alert that was just created. It should be called `ALERT14` (although the number may be different for you).
4) Click it again so that a blue box appears around the text `ALERT14`.
5) Change the name to NEW_ALERT.

Figure 3.2 ■ **New Data Block window.**

When you create objects, Forms gives them a default name (object name + #), as in ALERT14. This is true for all objects.

b)   How can you create a block **manually?** Change its name to CONTROL.

Answer: See discussion below.

If you had trouble with this, take the following steps:

1)   Select the Data Blocks node in the Object Navigator.
2)   Click the Create button.

A small window titled New Data Block opens, like the window pictured in Figure 3.2

3)   Select Build a new data block manually and click the OK button.
4)   Select the block that has just been created and name it CONTROL.

In Step 1, you selected the Data Blocks node and then clicked Create. Doing so in Forms positions your new block first in the list. If you had selected the INSTRUCTOR block, it would have put CONTROL second on the list.

When a form is running, the user will be able to navigate through the form by tabbing from item to item. Forms sets the default navigation order based on how the items are positioned in the Object Navigator. So, the first item in the first block listed in the Object Navigator will be navigated to first, then the next, and so on.

■ *FOR EXAMPLE:*

Figure 3.3 shows the Data Blocks node of the Object Navigator for a given form. Figure 3.4 shows the Layout Editor for the same form. Note the positions of the items in both the Object Navigator and Layout Editor. They are in a different order, aren't they?

Figure 3.3 ■ A block with items.

The order in the Object Navigator will take precedence over how the items are laid out on the screen. This means that when the form is run, the cursor will be positioned in STATE first because STATE is listed first in the Object Navigator. When the user tabs from text item to text item, navigation will be STATE - CITY - ZIP.

So, returning to EX03_01.fmb, because your CONTROL block is positioned first in the Navigator, whatever items you place in it will be the first that Forms navigates to. In the next Exercise, you will create a button. Depending on the requirements for the application, you may not want this button to be the first item that Forms navigates to. You will probably want Forms to navigate to the first enterable item in the INSTRUCTOR block. You can control the navigation order very easily by dragging items and blocks up and down in the Object Navigator to get them into the desired order. You will practice this in Exercise 3.1.3.

In the beginning, relying on default navigation is the easiest way to control navigation in your form. However, you are not limited to using default navigation order, and as your experience grows, you can override the defaults and control navigation by setting properties or writing triggers.
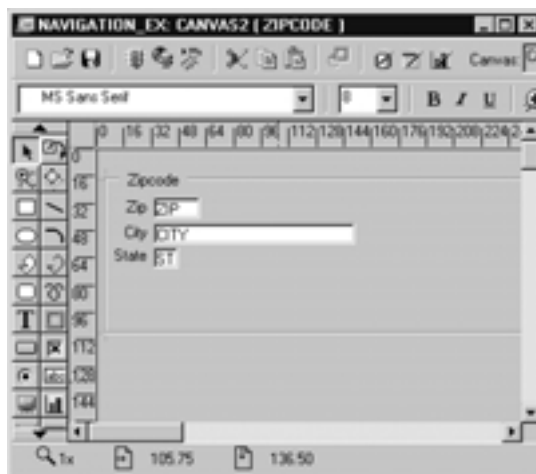
Figure 3.4 ■ The Layout Editor.

go to contents

Create two button items in the CONTROL block. Name one SAVE and the other EXIT.

c) Why can't you see these buttons in the Layout Editor?

Answer: You can't see these buttons because you have not assigned them to a canvas yet.

If you had trouble creating the buttons, take the following steps:

1) Select the Items node under the CONTROL block.
2) Click the Create button twice.
3) Rename the items SAVE and EXIT.
4) Go to the Property Palette for each item and change the Item Type property to Push Button.

Whenever you create items in the Object Navigator, they will not be visible until you go to Property Palette and set the item's Canvas property. You will also have to set the item's X Position and Y Position properties to position them properly on the canvas.

If you'd like to position these buttons on the canvas, take the following steps:

1) Select both buttons with CTRL + click.
2) In the Property Palette, change their Canvas property to INSTRUCTOR_SECTION.
3) Open the Layout Editor and you will see that they are now positioned in the upper left-hand corner of the canvas.
4) Drag them to positions below the SECTION frame.

You must have noticed also that you cannot specify an item's type in the Object Navigator. By default, the Object Navigator creates new items as text items, then it is up to you to change the properties accordingly.

Delete NEW_ALERT.

d) Which button did you use to delete it?

Answer: The Delete *button, which has a red X as its icon.*

You could also have pressed the DELETE key on your keyboard.

3.1.3 ANSWERS

a) How did the Object Navigator indicate that you were positioning
CONTROL.SAVE after INSTRUCTOR.ZIP?

Answer: A horizontal black line appeared to indicate where the button item would be positioned.

If you had trouble with this, take the following steps:

1) Expand the INSTRUCTOR block and all of the items contained
    within it.
2) Click and hold the CONTROL.SAVE button.
3) Drag it down into the INSTRUCTOR block until the horizontal
    black line is below INSTRUCTOR.ZIP.

Note that dragging an object *within* a form actually moves that object
from one place to another. Again, it is important to be aware of position-
ing in the Object Navigator. By placing the SAVE button after INSTRUC-
TOR.ZIP, you are indicating that you want the form to navigate from
INSTRUCTOR.ZIP to INSTRUCTOR.SAVE (as it now belongs to the IN-
STRUCTOR block), then to INSTRUCTOR.TELEPHONE.

b) Which buttons did you use and how were you able to position the button item
properly this time?

Answer: You should have used the Copy *button, which has two pieces of paper as its
icon, and the* Paste *button, which has a clipboard as its icon. You should have se-
lected* SECTION.CAPACITY *before pasting to put the item in the proper position.*

1) Select CONTROL.EXIT and click the Copy button.
2) Expand the SECTION block and the items below it.
3) Select SECTION.CAPACITY and click the Paste button.

Whenever you are pasting or creating objects in the Object Navigator,
they will always be positioned directly below the object that is currently
selected.

c) What happened as you tried to drag these objects from one form to the other?

*Answer: As you tried to drop the object, a small alert should have appeared asking you
whether you wanted to copy or subclass the object.*

d) What do you think the relationship will be between the objects in `EX03_01.fmb` and `EX03_03.fmb` if you choose `Subclass`?

Answer: There will be a link between the objects. The newly created or "dragged" object will become a child of the source object.

Subclassing is a concept that will be discussed in later Chapters, but you probably have an impression of what it means and how it can be useful. When you drag objects from one form to another, you are actually creating new objects based on old ones, or if you choose to subclass, child objects (subclassed objects) based on parent objects (source objects). The subclassed object is linked to the source in such a way that if changes are ever made to the source, the subclassed object will inherit these changes. This can be extremely helpful when you want to create an object or a group of objects that you will reuse over and over and over again.

e) What if you choose `Copy`?

Answer: You will be making a copy of the object in the new form. However, no relationship will exist between this new object and the one it was "dragged" from.

3.1.4 ANSWERS

a) Which button did you choose to run `EX03_03.fmb`?

Answer: You should have used the Run *button, which has the traffic light as its icon (the traffic light without the globe behind it).*

If you had trouble running the form, take the following steps:
1) Put the focus of the Form Builder anywhere within the form `EX03_03.fmb`.
2) Click the Run button. As you already know, the Run button has a traffic light as its icon.

To "put the focus" of the Form Builder on a certain form in the Object Navigator, you select any object within that forms module. This tells the Form Builder which form you want to work with when you click Run, Close, Compile, Save, and so forth. If you have multiple forms open at one time, which is often the case, getting the proper focus is essential.

b) What message did you receive when you ran this form?

Answer: An alert saying, "`A letter of approval from the director must accompany all teaching reassignments`*" should have appeared when you ran the form. If it did not, then you made a mistake when completing the tasks before in Exercises 3.1.3.c–e*

go to contents

3.1.5 ANSWERS

a) What types of objects are visible to you? (Give the object types like Synonyms, Rollback Segments, and so forth.)

Answer: Stored Program Units, PL/SQL Libraries, Tables, Views, and Types are visible.

If you had any trouble locating STUDENT's objects, take the following steps:

1) Expand the Database Objects node in the Object Navigator.
2) Expand the STUDENT schema.

b) Can you rename the STUDENT table to ST_STUDENTS?

Answer: No you cannot.

See the discussion under Question c for more details.

c) Can you add columns to the STUDENT table?

Answer: You cannot add columns to a table through the Object Navigator.

Tables, views, and columns are "read only," so you cannot change them. However, the Database Objects node is a handy way to examine the contents of database tables and views. It shows you table, view, and column names, as well as column data types and lengths. This can save you from having to go to SQL*Plus or another tool to view table descriptions.

d) Does the STUDENT table have any triggers?

Answer: No.

e) Are you able to create and edit database triggers?

Answer: Yes you are.

You can create and edit any stored PL/SQL object through the Form Builder. To test this out, simply select the Triggers node for the STUDENT table and click the Object Navigator's Create button. The database trigger editor will open and you will be able to set the trigger type as well as write the trigger code. You can also write PL/SQL stored procedures, packages, and functions through the Form Builder.

But, be careful! While it is convenient to be able to crank out quick functions and procedures straight from the Form Builder, it is also a bit dangerous in that you can drop PL/SQL objects from the database as well.

LAB 3.1 SELF-REVIEW QUESTIONS

In order to test your progress, you should be able to answer the following questions:

1) How does the Object Navigator organize Forms elements?
   a) _____ In a grid
   b) _____ By object ID
   c) _____ In a hierarchy
   d) _____ Arbitrarily

2) It is possible to use the Object Navigator to do which of the following?
   a) _____ Compile a form
   b) _____ Save a form
   c) _____ Delete a form
   d) _____ All of the above

3) In the Object Navigator, which of the following can you change with regard to an item?
   a) _____ The block it belongs to
   b) _____ Its name
   c) _____ Its order in the hierarchy
   d) _____ All of the above

4) Whenever you are pasting or creating objects in the Object Navigator, they will always be positioned directly below the object that is currently selected.
   a) _____ True
   b) _____ False

5) You can add columns to a table through the Object Navigator by selecting the column to the right of the column you wish to add and clicking the `Create Column` button.
   a) _____ True
   b) _____ False

6) Which of the following best describes subclassing?
    a) _____ When one object is linked to another object in such a way that if changes are made to either object, both objects are updated with these changes
    b) _____ When you make a copy of an object in one form and place it into another form
    c) _____ When a source object is linked to a subclassed object in such a way that if changes are ever made to the source, the subclassed object can inherit these changes
    d) _____ Creating new objects based on old ones

7) While you can drag objects from one form to another, you cannot drag an object from node to node within a form.
    a) _____ True
    b) _____ False

Quiz answers appear in Appendix A, Section 3.1.

go to contents

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THE PROPERTY PALETTE

LAB OBJECTIVES

After this Lab, you will be able to:

- View Properties
- Change Properties

In the Object Navigator, you create objects; in the Property Palette, you define objects. The Property Palette displays a list of characteristics (properties) for whichever object is currently selected in a form. The look, feel, and behavior of an object can be defined by its properties.
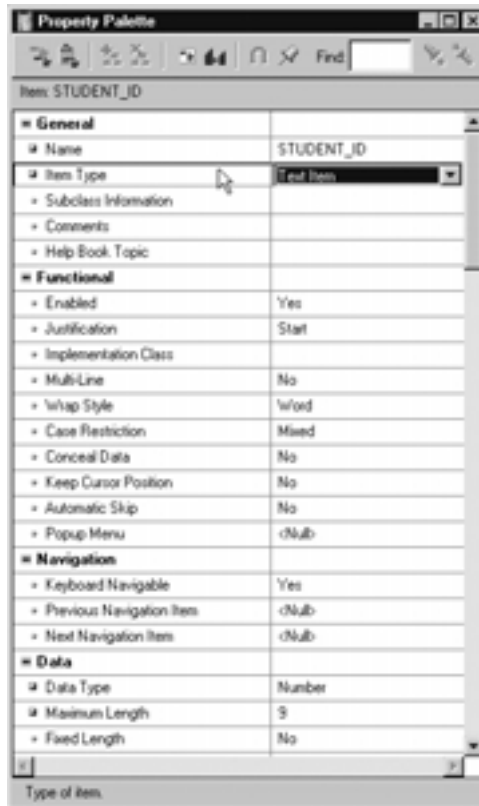
VIEW PROPERTIES

Figure 3.5 shows a screenshot of the Property Palette displaying the properties for a text item.

First be aware that what is shown here is not the entire Property Palette. The window is scrollable, and for an item, the list of properties is over four times as long as the list you see in the figure. Having this many configurable properties gives you a tremendous amount of control over the object.

The Property Palette is coordinated with both the Object Navigator and Layout Editor. So, if you select an object in either of these tools, its properties appear in the Property Palette.

Within the Property Palette, properties are grouped in categories like General, Physical, Database, and so on. These categories are expandable and collapsible like the nodes in the Object Navigator. Having this expand-and-collapse ability makes it much easier to view properties.

Figure 3.5 ■ The Property Palette.

CHANGING PROPERTIES

Forms objects are defined by their properties. So, if you change an object's properties, you are changing its definition.

If the changes you make affect an object's physical appearance, those changes will be immediately apparent in the Layout Editor. By the same token, any changes you make graphically in the Layout Editor will be immediately apparent in the Property Palette.

You can change properties for one object at a time, or you can do mass changes by selecting multiple objects.

■ *FOR EXAMPLE:*

Let's say you wanted 10 items in your form to be displayed in the font Times New Roman. To make mass property changes to these items, you would take the following steps:

go to contents

**LAB
3.2**

1) Select the 10 items in the Object Navigator or Layout Editor.
2) Change the `Font Name` property to `Times New Roman` in the Property Palette.

LAB 3.2 EXERCISES

3.2.1 VIEW PROPERTIES

Open form `EX03_02.fmb` in the Form Builder.

> **a)** Explore the Form Builder and list three different ways of opening the Property Palette for the `STUDENT.PHONE` item.

> **b)** View the properties for the `STUDENT` block. Now switch to view the properties of the `STUDENT` canvas. What are the first three nodes in the Property Palette for the block? for the canvas?

View the `Bevel` property for the `STUDENT.PHONE` item. Press the F1 key (for MS Windows users) to view help for the `Bevel` property.

> **c)** What is the purpose of the item's `Bevel` property? Besides the F1 key, can you see another way to get a hint about what the property is for?

3.2.2 CHANGE PROPERTIES

Use form `EX03_02.fmb` as in the previous Exercise.

For the item `STUDENT.ZIP`, change the following properties:

*   `Font Name` to `Arial`.
*   `Font Weight` to `Demibold`.

go to contents

- `Insert Allowed` to `No`.
- `Update Allowed` to `No`.

a) What happened to the small icons to the left of the property names? Why is this helpful?

_____

_____

Go back to the properties for `STUDENT.ZIP` and select the `Insert Allowed` property. Click the `Inherit` button on the Property Palette's toolbar.

b) What happened?

_____

_____

Stay with the properties of `STUDENT.ZIP`. Click the `Freeze` button so that its icon becomes a pinhead rather than a full pin. Select `STUDENT.PHONE` in the Object Navigator. Right-click to open another Property Palette window. Drag this window to the left.

c) What can you see under the Property Palette window you just dragged away?

_____

_____

Use CTRL + click to select `STUDENT.ADDRESS`, `STUDENT.EMPLOYER`, and `STUDENT.REGISTRATION_DATE`. View the `Y Position` property for each object.

d) What are the values of these properties? Can you change them?

_____

_____

e) View the `Name` property for all of these items. Can you change that property?

_____

_____

In Question a of this Exercise, you changed the `Font Name` and `Font Weight` properties for `STUDENT.ZIPCODE`. Copy the font-related properties from one of these items and paste them to the remaining items in the `STUDENT` block.

f) Can you complete this task for all of the items at once? How?

LAB 3.2 EXERCISE ANSWERS

3.2.1 ANSWERS

a) Explore the Form Builder and list three different ways of opening the Property Palette for the `STUDENT.PHONE` item.

Answer: There are actually five ways to access the palette from the Form Builder:

1) From the Main Menu, select `Tools | Property Palette`.
2) In the Object Navigator, select the object whose properties you'd like to see and right-click.
3) In the Object Navigator, double-click on the icon to the left of the object whose properties you'd like to see (this does not work for canvases).
4) In the Layout Editor, select the object whose properties you'd like to see and right-click.
5) Press F4.

Because the Property Palette is a tool you will access frequently, it is helpful to familiarize yourself with all of the methods listed here.

b) View the properties for the `STUDENT` block. Now switch to view the properties of the `STUDENT` canvas. What are the first three nodes in the Property Palette for the block? for the canvas?

Answer: For the block, the first three nodes are `General`, `Navigation`, *and* `Records`. *For the canvas, they are* `General`, `Functional`, *and* `Physical`.

This illustrates two important points: first, that there is coordination between the Object Navigator and Property Palette; second, that the properties for each type of object can vary greatly.

c) What is the purpose of the item's `Bevel` property? Besides the F1 key, can you see another way to get a hint about what the property is for?

Answer: For an item, setting the `Bevel` property changes the appearance of the item's border. Besides pressing F1, you can find this out by looking at the Property Palette's hint line.

The help system has a lot of information to offer about a property. Obviously, you can get a description of the property. In addition, the help system lists restrictions for using the property and the Forms *built-in* you would have to use to change this property programmatically. A *built-in* is a pre-written sub-program that you can use for standard application functions. To change an item programmatically, you write a trigger that calls a built-in.

■ *FOR EXAMPLE:*

Let's say you want to create a button that changes the foreground color (font color) of the STUDENT_ID item. You would write a WHEN-BUTTON-PRESSED trigger that would include the following command:

```
SET_ITEM_PROPERTY('STUDENT.STUDENT_ID', foreground_color, 'red');
```

The built-in is SET_ITEM_PROPERTY. There are hundreds of built-ins available in Forms, and as you get deeper into this workbook, you will learn more of them.

3.2.2 ANSWERS

a) What happened to the small icons to the left of the property names? Why is this helpful?

Answer: They have changed from small dots to small green squares. This is helpful because it shows which properties have been changed and which still have their original value.

In later Chapters when you experiment with visual attributes, property classes, and subclassing, you will see even more changes to the icons in the Property Palette.

b) What happened?

Answer: The property has been returned to its default value.

go to contents

In this case, the property was returned to its default value. Think of this as an undo-like feature for properties.

c) What can you see under the Property Palette window you just dragged away?

Answer: You can see the frozen Property Palette, which is listing the properties for STUDENT.PHONE.

Usually, you will only be viewing one object at a time. But in some cases, you will want to view the properties of two or three objects side-by-side to make comparisons.

The Freeze/Unfreeze button on the Property Palette's toolbar gives you this capability. This button has a pin as its icon. It can be especially helpful when you wish to compare X and Y positions of multiple objects. You can continue to pin and open additional instances of the Property Palette as many times as you'd like.

d) What are the values of these properties? Can you change them?

Answer: The values are ****. Yes, you can change them.

Figure 3.6 shows the font properties for the four items that have been selected.

Note that Font Name and Font Weight have question marks next to the property name and asterisks where the property's value should be. Here, Forms is indicating that the objects you have selected have different values for this property. On the other hand, note that each of the objects selected has the same value for the Font Size, Font Style, and Font Spacing properties.

e) View the Name property for all of these items. Can you change that property?

Answer: No you cannot.

Figure 3.6 ■ The Property Palette when more than one object has been selected.

Not all properties are available for mass changes. The purpose of mass changes is to give more than one object the same value for a certain property. Therefore, Forms will not allow you to do mass changes on the `Name` property of items because all items within a block must have a unique name.

Also, Forms will not allow you to do mass changes to the `Subclass In-formation` property.

f) Can you complete this task for all of the items at once? How?

Answer: Yes you can. Copy the properties for `STUDENT.ZIPCODE`*, then select all of the items in the* `STUDENT` *block. Click any property in the Property Palette to put the focus there, then click the* `Paste Property` *button.*

As you can see, there are many ways to change the properties for multiple items at once.

LAB 3.2 SELF-REVIEW QUESTIONS

In order to test your progress, you should be able to answer the following questions:

1) The Property Palette has which of the following?
   a) _____ A list of configurable properties
   b) _____ Height and width information
   c) _____ a & b

2) What feature can you use to view two instances of the Property Palette simultaneously?
   a) _____ The Paste Property Window feature
   b) _____ The Navigator
   c) _____ The `Freeze/Unfreeze` button
   d) _____ The Inherit feature

3) Which of the following are possible in the Property Palette?
   a) _____ Mass edits of properties
   b) _____ Running multiple forms
   c) _____ Copying properties
   d) _____ a & c

4) How are changes to properties indicated in the Property Palette?
   a) _____ The changed property's value is highlighted
   b) _____ The changed property's value is grayed out
   c) _____ There is no indication
   d) _____ The changed property has a green box as its icon

5) Which of the following have properties that can be viewed in the Property Palette?
   a) _____ Triggers
   b) _____ Items
   c) _____ Record Groups
   d) _____ All of the above

6) What does the inherit feature do?
   a) _____ Returns a property to its default value
   b) _____ Copies properties from other objects
   c) _____ Creates a new version of the property
   d) _____ None of the above

7) How will properties appear in the Property Palette if two objects are selected in the Object Navigator?
   a) _____ If the property value is the same for both of the objects, ***** will be displayed
   b) _____ If the property value is different for both of the objects, ***** will be displayed
   c) _____ The Property Palette will be blank
   d) _____ Both values will appear separated by commas

Quiz answer appear in Appendix A, Section 3.2.

L A B   3 . 3

THE LAYOUT EDITOR

LAB OBJECTIVES

After this Lab, you will be able to:

- Create and Format Objects
- Arrange and Size Objects

The Layout Editor complements the Object Navigator and Property Palette in that it allows you to give faces to the objects you create and configure. Here you will visually position, arrange, size, and color your objects.

In the Object Navigator, you can create any object, be it logical or physical. In the Layout Editor, you can only create *physical* objects that can appear on a canvas, such as items, other canvases, and graphics. Graphics include frames and any other non-item objects like rectangles, circles, lines, and static text.

The Layout Editor has three toolbars that provide utility, formatting, and create functions. Figure 3.7 shows the Layout Editor and its toolbars.

Figure 3.7 ■ The Layout Editor and its three toolbars.

The Forms help system does not use these names for the toolbars. They are used in this text for the sake of the explanations and Exercises.

A brief introduction to the toolbars will provide a good starting point for understanding the Layout Editor.

UTILITY TOOLBAR

From the Utility toolbar, you can open, save, and run forms, as well as cut and paste and so on. As these functions are shared with the Object Navigator, there is no reason to explain them in detail.

The Utility toolbar also lets you coordinate which block or canvas you are working with, as well as gain access to the wizards.

FORMATTING TOOLBAR

The first half of the Formatting toolbar is for formatting text and is similar in look and function to the equivalent toolbar you see in word proces-

sors. It also provides tools for positioning and arranging text. The more tidy a form is, the easier it will be on the user's eyes. The Exercises will walk you through the Formatting toolbar so that you can quickly and easily position objects in an orderly manner.

VERTICAL TOOLBAR OR TOOL PALETTE

The Tool Palette lets you

- Select, rotate, and reshape objects.
- Create graphic objects.
- Create items.
- Color objects.

You will explore each of these functions in this Lab's Exercises.

The most powerful feature of the Tool Palette is that it provides an alternative to creating items in the Object Navigator.

LAB 3.3 EXERCISES

3.3.1 CREATE AND FORMAT OBJECTS

Open EX03_03.fmb in the Form Builder. Open the Layout Editor and Property Palette.

The objective of this set of Exercises is to learn the functions of the Layout Editor by cleaning up EX03_03.fmb.

Use the Layout Editor to create a button item and position it anywhere within the Student frame. Change its name to EXIT and change its label to Exit.

a) Which toolbar did you use to create the EXIT button?

_____

_____

b) Which block was EXIT assigned to?

_____

_____

go to contents

In the Object Navigator, create a block manually and name it CONTROL. Drag EXIT from the STUDENT block into the CONTROL block. Your objective is to create two more buttons for the CONTROL block. Before doing so, answer the following questions.

> **c)** Which feature on the Utility toolbar can you use to ensure that these new buttons are assigned to the CONTROL block?

Select the Button tool on the Tool Palette by clicking it once. The button will appear inset as if it has been "pressed." Now, double-click it until an icon appears.

> **d)** What icon has appeared on the Button tool?

Drag the mouse pointer into the canvas area on the Layout Editor and click once in one spot, then click again in another spot.

> **e)** What has "pinning" the Button tool allowed you to do?

> **f)** How do you think you can get out of the Pinning mode?

Rename and label these new buttons Save and Print. Arrange them neatly below the STUDENT frame.

Using the Layout Editor's horizontal toolbar, change the font of the STU-DENT_ID item to Ms Sans Serif, 8 pt.

g) Can you repeat the font change you just made by selecting all of the remaining items and prompts on the canvas?

_____

_____

There are three buttons at the bottom of the Tool Palette that deal with color.

h) What are the Tool Tips for each of these buttons, and which property do you think each corresponds to?

_____

_____

i) Can you change the background color for all of the text items to white? Be sure to do this simultaneously for all items. Do not include the button items.

_____

_____

j) How about the foreground color? How would you change the foreground color for all of the items so that they are blue?

_____

_____

k) Have the prompt background colors changed, too? Can you change their background colors to gray without affecting the text items?

_____

_____

3.3.2 ARRANGE AND SIZE OBJECTS

Select all of the text items on the canvas. Do not include the buttons. Use the Layout Editor's Formatting toolbar to arrange all of the text items on the canvas so that they are flush-left (meaning their left-hand edges are all in a line). _Hint: You may have trouble aligning if you select both the item and its prompt._

a) Which button on the Formatting toolbar did you choose?

There are some Layout Editor functions that are not available on the toolbars. From the Main Menu, select `Arrange | Size Objects` to open the `Size Objects` dialog.

b) Which options would you select to give the objects a height of 14 points?

Again, have only the text items selected and from the Main Menu, select `Arrange | Align` objects.

c) Which options should you choose to stack the objects vertically?

Select the `STUDENT` frame and change its `Update Layout` property to `Automatically`. Move three or four of the items so that they are misaligned by dragging them out of their current positions. Select the `STUDENT` frame in the Layout Editor. Click the `Update Layout` button on the Utility toolbar.

d) What has the `Update Layout` button done?

e) Does this button update the layout of a canvas or frame?

go to contents

f) What must the frame's `Update Layout` **property be set to for it to work?**

LAB 3.3 EXERCISE ANSWERS

3.3.1 ANSWERS

a) Which toolbar did you use to create the `EXIT` button?

Answer: The Tool Palette and the button, too.

If you had trouble with this, take the following steps:

1. On the Layout Editor's Tool Palette, click the `Button` tool so that it appears to be inset. As you would imagine, the `Button` tool has a button as its icon!
2. Move the mouse pointer into the layout area and it will change into a crosshair.
3. When you have chosen a position, click once and the button will be created.
4. Upon clicking, the crosshair indicates where the button's upper left-hand corner will be positioned. This is true for the creation of other items as well.

For graphical objects such as items, stacked canvases, and frames, it is common to use the Layout Editor for creation. This way, you get to create, position, and size the object all at once.

In this question, you single-clicked to create the button, which gave it the default size. Had you clicked and held the mouse button, you would have been able to drag out the size of the button as you were creating it. Create another button in `EX03_03.fmb` and try to size it upon creation.

The upper left-hand corner of an object is what indicates its position. What this means is that if the `X Position` and `Y Position` properties are set to `10, 10`, the object's upper left-hand corner is at the coordinates 10, 10. This is true for items, frames, canvases, windows, and all other graphical objects.

Go into the Layout Editor and slowly drag the mouse pointer in circles. Look at the Layout Editor's hint line and you will see two numbers changing rapidly. These indicate the current X, Y position, in points, of the mouse pointer relative to the current canvas. The rules you see on the edge of the Layout Editor are also given in points, one of the standard units of measure for graphical objects.

b) Which block was EXIT assigned to?

Answer: It was assigned to the STUDENT *block.*

c) Which feature on the Utility toolbar can you use to ensure that these new buttons are assigned to the CONTROL block?

Answer: On the Utility toolbar, use the drop-down list labeled Block*.*

When you begin to work with multi-block forms, it will be common for you to have objects from more than one block on the same canvas. When creating additional objects for these blocks in the Layout Editor, it will be important that you adjust the Block drop-down list accordingly. But, if you do forget to adjust it and you end up creating an item in the wrong block, you can use the Object Navigator to drag the item to the correct block.

d) What icon has appeared on the Button tool?

Answer: A small pin icon.

e) What has "pinning" the Button tool allowed you to do?

Answer: Pinning allows you to create more than one button at once.

Pinning works for all the objects that you can create from the Tool Palette, including graphical objects and canvases. It was extremely helpful in this case, when you needed to create multiple buttons, and it will come in handy in future Exercises when you will need to quickly create more than one display item.

f) How do you think you can get out of the Pinning mode?

Answer: Click the Select *tool in the upper right-hand corner of the Tool Palette, or any other tool in the Tool Palette.*

g) Can you repeat the font change you just made by selecting all of the remaining items and prompts on the canvas?

Answer: Yes you can.

Selecting deserves a bit of attention. The Windows select functions work here, so you could CTRL + click items individually to select them.

However, in this case, because you are selecting many items, it is best to "rubber-band" them. To do so, you would follow these steps:

1. Position the mouse pointer above and to the left of all the items.
2. Click and drag so that you are creating a rectangular band.
3. Stretch this band around all of the items and release to select them. The entire object must be within the band for it to be included in the selection.

You can now start formatting and setting properties for all of the items and objects that you have selected. You can also move them as a group. If you were to single-click and drag one of the selected objects, all of the other objects would move with it.

To perform an operation on everything on a canvas, go to the Main Menu and select Edit | Select All.

h) What are the Tool Tips for each of these buttons, and which property do you think each corresponds to?

Answer: Listed from top to bottom: Fill Color *corresponds to* Background Color, Line Color *corresponds to* Edge Foreground *color, and* Text Color *refers to* Foreground Color.

Ignore Line Color since it only applies to frame edges and other graphical objects. Fill Color and Text Color are the tools you will use most frequently since they are what will alter the color of the text in a text or display item and the color of, obviously, its background.

i) Can you change the background color for all of the text items to white? Be sure to do this simultaneously for all items. Do not include the button items.

Answer: Yes you can.

If you had trouble with this, try these simple steps:

1) Select all of the items, *but not* their prompts. The best way to do this is to rubber-band everything then deselect the prompts.
2) Click the Fill button and choose white to change the background color. The Fill button has a paint can as its icon.

go to contents

j) How about the foreground color? How would you change the foreground color for all of the items so that they are blue?

Answer: Multi-select all of the items, click the Text Color *button, and select blue.*

k) Have the prompt background colors changed, too? Can you change their background colors to gray without affecting the text items?

Answer: Yes, some of them have probably changed to blue. CTRL + click all of the discolored prompts and use the Fill *button to change their background color to gray.*

3.3.2 ANSWERS

a) Which button on the Formatting toolbar did you choose?

Answer: The button with Align Left *as its Tool Tip.*

As you experienced in some of the questions in Exercise 3.2.3, it is often necessary to deselect the prompts when performing group operations like coloring or arranging. In this case, you do not want the prompts to be included in the aligning function. You only want to align the text items and the prompts will follow.

b) Which options would you select to give the objects a height of 14 points?

Answer: Under Width, *select* No Change. *Under* Height, *select* Custom, *and then type* 14 *into the text item. Under* Units, *select* Points.

The Size Objects window lets you enter custom measurements as you did in Question b, and it also lets you size objects based on other objects.

c) Which options should you choose to stack the objects vertically?

Answer: Under Align, *select* Each Other. *Under* Horizontally, *select* None. *Under* Vertically, *select* Stack.

d) What has the Update Layout button done?

Answer: The Update Layout *button has automatically arranged the items on the canvas.*

e) Does this button update the layout of a canvas or frame?

Answer: Update Layout *only works for items within a frame.*

Other items on the canvas that are outside the frame will not be adjusted when you click the Update Layout button.

f) What must the frame's `Update Layout` property be set to for it to work?

Answer: The `Update Layout` *property must be set to either* `Automatically` *or* `Manually`.

Once you have completed the Exercises in this Lab, the items in your canvas should be arranged and formatted as they are in Figure 3.8.

Figure 3.8 ■ `EX03_03.fmb` after its layout has been cleaned up.

LAB 3.3 SELF-REVIEW QUESTIONS

In order to test your progress, you should be able to answer the following questions:

1) Which of the following can you *not* view in the Layout Editor?
  a) _____ Radio button
  b) _____ Check box
  c) _____ Block
  d) _____ Frame

2) The Layout Editor is coordinated with which of the following?
  a) _____ The Property Palette
  b) _____ The Main Menu
  c) _____ The Forms Runtime
  d) _____ The hint line on a running form

go to contents

3) All objects in the Layout Editor are which of the following?

    a) ____ Items

    b) ____ Physical

    c) ____ Logical

    d) ____ a & b

4) Which of the following *can* you do in the Layout Editor?

    a) ____ Create and delete objects

    b) ____ Run a form

    c) ____ Change the background color of a frame

    d) ____ a & b

    e) ____ All of the above

5) How do the X Position and Y Position properties indicate the position of an object on a canvas?

    a) ____ They indicate the position of the center of the object

    b) ____ They indicate the position of the upper left-hand corner of the object

    c) ____ They are not used to indicate position on the canvas

    d) ____ None of the above

6) Which of the following can you do when creating objects in the Layout Editor?

    a) ____ You can size them

    b) ____ You can position them

    c) ____ You can assign them to blocks

    d) ____ All of the above

Quiz answers appear in Appendix A, Section 3.3.

**LAB
3.3**

C H A P T E R   3

TEST YOUR THINKING

Use the wizards to quickly create a form based on the INSTRUCTOR table. In-clude all of the columns as items in the block. Enforce data integrity should be **unchecked**. Do not display the audit columns on the canvas. Use the Layout Editor and Property Palette to adjust the items so that they appear as they do in Figure 3.9.

What Layout Editor feature can you use to make the prompts flush left?

What Layout Editor feature can you use to group the items and their prompts together?

What property can you use to have text appear in the window's title bar?

Draw a solid white rectangle on the canvas. What Layout Editor tools can you use to position it in front of or behind other objects on the canvas? Can you position the rectangle on top of an item or a prompt? What types of canvas objects can be positioned in front of or behind the rectangle?

Figure 3.9 ■ A block based on the INSTRUCTOR table with items arranged.

go to contents