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1. Relationships

In this lesson, you will learn...

1. About referential integrity.
2. How to establish relationships between tables.

1.1 Review

In the introductory course, we defined a *relational database* as a collection of data sets organized in multiple tables. We went on to say that each table in a relational database has well-defined relationships with one or more other tables in the database.

We showed how to normalize data in preparation for establishing these relationships. Open [Relationships/Demos/Demo - My Music Collection.accdb](#) to begin.

For example, suppose we start with the following unnormalized data:

Title	Artist	Format	Format Description
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
I Got a Name	Jim Croce	8-tr	8-track tape
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
The White Album	Beatles	CD	Compact disc
I Remember Yesterday	Donna Summer	Cass	Cassette tape
Rachmaninov Piano Concerto 1 & 3	Cleveland Orchestra	CD	Compact disc
Just a Dream	Carrie Underwood	MP3	MP3 file
Music of the Night	Alfie Boe	MP3	MP3 file
King of Swing!	Count Basie and His Orchestra	CD	Compact disc
Pirates of Penzance	D'oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Skyfall	Adele	MP3	MP3 file

To achieve First Normal Form, we eliminate repeating groups of data by creating separate tables for each related group of data and assigning a primary key field to

Relationships

each table. In our example, we have no repeating groups, so we simply need to assign a primary key, Recording_ID, to the Recordings table.

Recording_ID	Title	Artist	Format	Format Description
1	Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
2	I Got a Name	Jim Croce	8-tr	8-track tape
3	Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
4	A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
5	The White Album	Beatles	CD	Compact disc
6	I Remember Yesterday	Donna Summer	Cass	Cassette tape
7	Rachmaninov Piano Concerto 1 & 3	Cleveland Orchestra	CD	Compact disc
8	Just a Dream	Carrie Underwood	MP3	MP3 file
9	Music of the Night	Alfie Boe	MP3	MP3 file
10	King of Swing!	Count Basie and His Orchestra	CD	Compact disc
11	Pirates of Penzance	D'oyly Carte Opera Company	33	33 1/3 RPM vinyl record
12	Skyfall	Adele	MP3	MP3 file

To achieve Second Normal Form, we eliminate redundant data by separating it into new tables. Notice that in our example, the artist and format data repeats. We need

to separate these tables from the original Recordings table and assign a primary key to each table.

Artist_ID	Artist
1	Count Basie and His Orchestra
2	Jim Croce
3	Cleveland Orchestra
4	Beatles
5	Donna Summer
6	Carrie Underwood
7	Alfie Boe
8	D'Oyly Carte Opera Company
9	Adele

Format_ID	Format	Description
1	ACE	Acetate disc
2	78	78 RPM vinyl record
3	45	45 RPM vinyl record
4	33	33 1/3 RPM vinyl record
5	Cass	Cassette tape
6	8-tr	8-track tape
7	CD	Compact disc
8	MP3	MP3 file

Now that the redundant data is separated out, we replace the data in the Recordings table with foreign keys (the primary keys from the Artists and Recording Formats tables).

Recording_ID	Title	Artist_ID	Format_ID
1	Right On	1	2
2	I Got a Name	2	6
3	Smetana: Moldau, Overtures	3	4
4	A Hard Day's Night	4	4
5	The White Album	4	7
6	I Remember Yesterday	5	5
7	Rachmaninov Piano Concerto 1 & 3	3	7
8	Just a Dream	6	8
9	Music of the Night	7	8
10	King of Swing!	1	7
11	Pirates of Penzance	8	4
12	Skyfall	9	8

To achieve Third Normal Form, we remove columns in tables that don't depend directly on the table's primary key. In our relatively simple data set, we don't have any such columns, so we can consider our data normalized to Third Normal Form.

In brief, each table in a database should have a single focus. When you notice that secondary items in the table are repeating, it's a signal to break the repeating topic into a table of its own and assign it its own primary key. This primary key becomes the source for a foreign key field in the original table. For the sake of good

Relationships

organization, though optional, the primary key and foreign key should share the same name and must be of similar data type.

After normalization, we discussed the three relationships possible between tables.

- *One-to-many*. Table A has a one-to-many relationship with Table B if a record in Table A can match one or more records in Table B but each record in Table B must match only one record in Table A.
- *Many-to-many*. Table A has a many-to-many relationship with Table B if Table A can have one or more matches in Table B and Table B can have one or more matches in Table A.
- *One-to-one*. Table A has a one-to-one relationship with Table B if Table A can have no more than one matching record in Table B and Table B can have no more than one matching record in Table A.

To ensure data integrity it is not enough to simply acknowledge the types of relationships that exist between tables, it is essential that we define the relationships so that they can be enforced.

1.2 Referential Integrity

Let's consider the recording tables again. Suppose I delete a record from the Artists table.

Artist_ID	Artist
1	Count Basie and His Orchestra
2	Jim Croce
3	Cleveland Orchestra
4	Beatles
5	Donna Summer
6	Carrie Underwood
7	Alfie Boe
8	D'Oyly Carte Opera Company
9	Adele



Artist_ID	Artist
1	Count Basie and His Orchestra
2	Jim Croce
4	Beatles
5	Donna Summer
6	Carrie Underwood
7	Alfie Boe
8	D'Oyly Carte Opera Company
9	Adele

The result is that there are records in the Recordings table that refer to an artist record that no longer exists. We call this sort of record an *orphaned record*.

Recording_ID	Title	Artist_ID	Format_ID
1	Right On	1	2
2	I Got a Name	2	6
3	Smetana: Moldau, Overtures	3	4
4	A Hard Day's Night	4	4
5	The White Album	4	7
6	I Remember Yesterday	5	5
7	Rachmaninov Piano Concerto 1 & 3	3	7
8	Just a Dream	6	8
9	Music of the Night	7	8
10	King of Swing!	1	7
11	Pirates of Penzance	8	4
12	Skyfall	9	8

Suppose instead of deleting a record from the Artists table, I change a record:

Artist_ID	Artist
1	Count Basie and His Orchestra
2	Jim Croce
3	Cleveland Orchestra
4	Beatles
5	Donna Summer
6	Carrie Underwood
7	Alfie Boe
8	D'Oyly Carte Opera Company
9	Adele



Artist_ID	Artist
1	Count Basie and His Orchestra
2	Jim Croce
3	Cleveland Orchestra
4	Monkees
5	Donna Summer
6	Carrie Underwood
7	Alfie Boe
8	D'Oyly Carte Opera Company
9	Adele

The result this time is not orphaned records, but incorrect records.

Relationships

Recording_ID	Title	Artist_ID	Format_ID
1	Right On	1	2
2	I Got a Name	2	6
3	Smetana: Moldau, Overtures	3	4
4	A Hard Day's Night	4	4
5	The White Album	4	7
6	I Remember Yesterday	5	5
7	Rachmaninov Piano Concerto 1 & 3	3	7
8	Just a Dream	6	8
9	Music of the Night	7	8
10	King of Swing!	1	7
11	Pirates of Penzance	8	4
12	Skyfall	9	8

Referential integrity ensures that orphaned records are not created and that references are not changed arbitrarily. We can turn on referential integrity when we create relationships between tables. When referential integrity is turned on, Access refuses to allow actions that would compromise the integrity of the relationship.

There may be valid reasons for allowing changes to or deletions of primary keys. For these cases, Access provides **Cascade Update Related Fields** and **Cascade Delete Related Records** options when you enable referential integrity. **Cascade Update Related Fields** updates all records that reference the affected primary key. **Cascade Delete Related Records** deletes all records that reference the affected primary key.

1.3 Relationships

Access provides a tool for formalizing the relationships among tables. The relationships themselves are intrinsic to the structure of the database tables. The fact that we have added a foreign key column to one table with data that matches (or is compatible with) the data type of the primary key field of another table is sufficient to establish the relationship. Access, however, provides a tool to formalize this relationship and help us keep that relationship in mind as we work with the database.

Data Types and Relationships

When you formalize the relationship by connecting a pair of fields in two tables, you must ensure that the fields have the same data type or compatible data types. For example, if one field stores its data as numbers and the other stores its data as text, you cannot use the fields in a relationship.

Significantly, autonumber fields and number fields may be compatible provided that the field size of the number field is "long integer". For instance, consider the My Music Collection database. Assuming that the primary key of the Artists table, Artist_ID, is an autonumber field, we could associate it to the Artist_ID field in the

Recordings table as a foreign key provided that the Artist_ID in the Recordings table is a long integer number field. The same would be true for the Format_ID fields.

Formalize the Relationship Between Tables

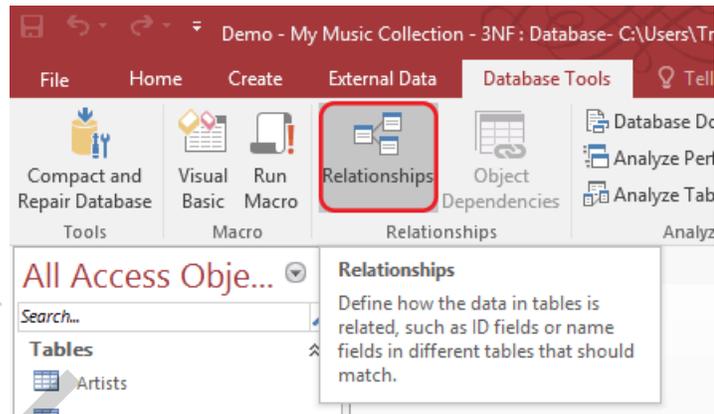
To formalize the relationship between two tables: Open Relationships/Demos/Demo - My Music Collection - 3NF.acedb to begin.

1. Open the database. (For this demonstration, we'll use the Demo - My Music Collection - 3NF database.)

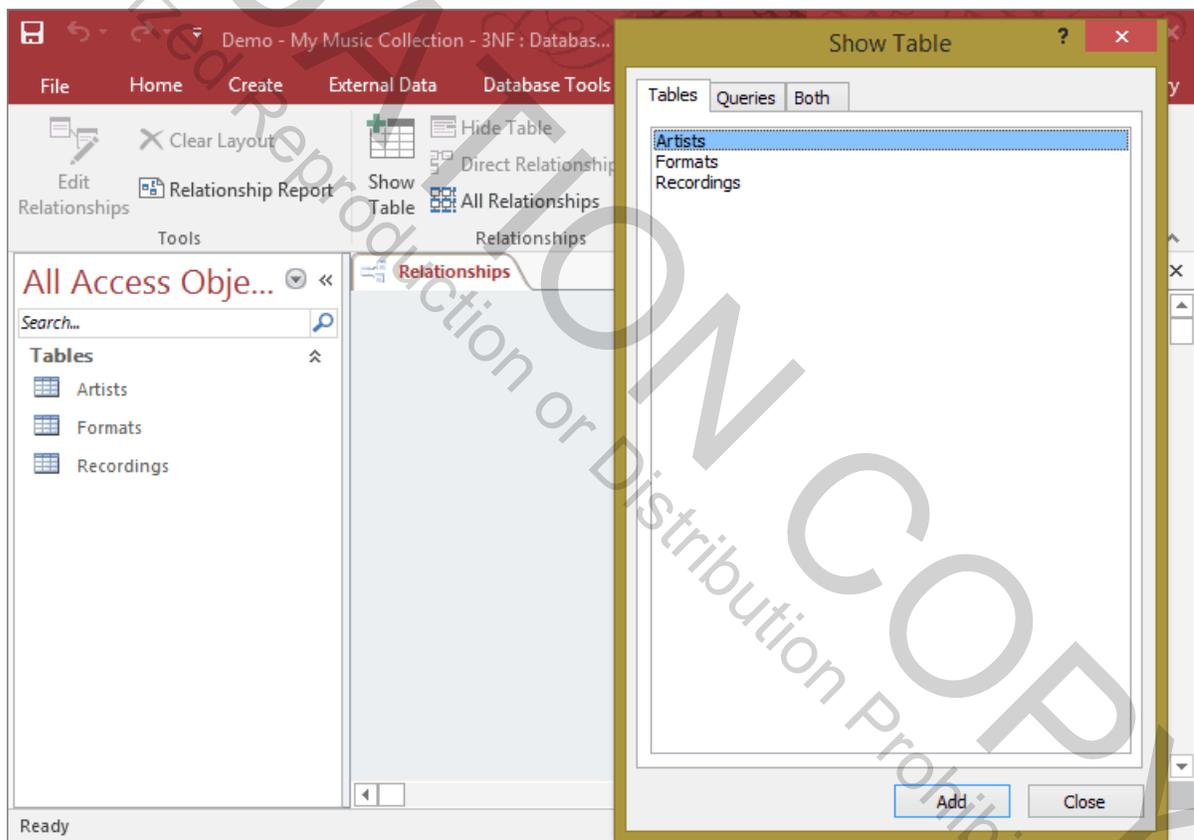
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Relationships

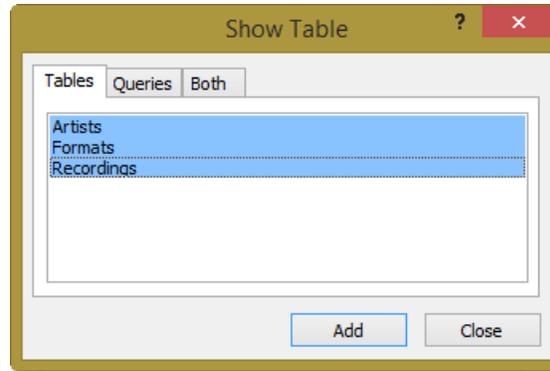
2. On the **Database Tools** tab, click **Relationships**.



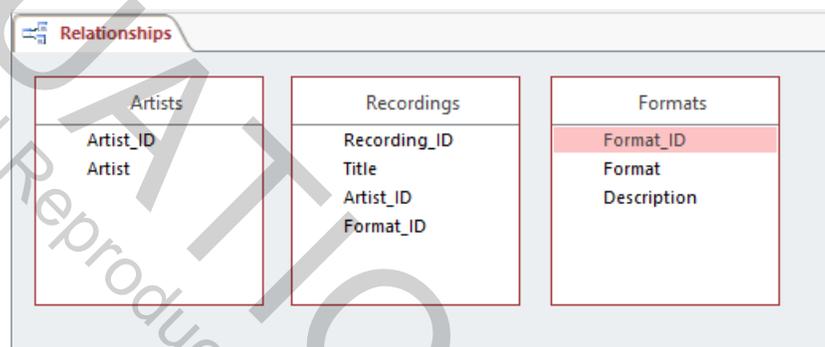
3. The **Show Table** dialog box opens.



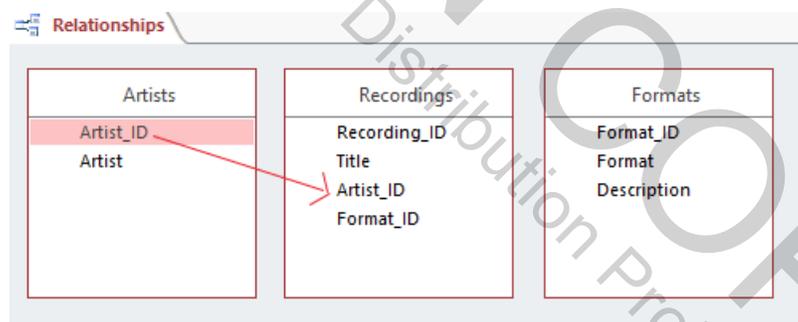
4. On the **Tables** tab, highlight the tables you want to establish relationships between, then click **Add**.



- Click **Close**. Representations of the tables are added to the **Relationships** tab in the workspace.

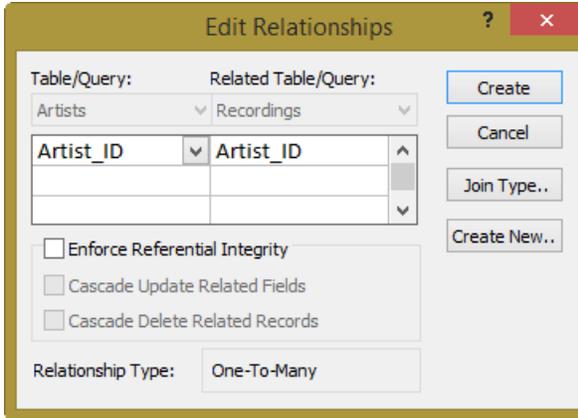


- To establish a one-to-many relationship, highlight the key field from the "one" side of the relationship and drag and drop it onto the corresponding field in the table on the "many" side of the relationship.

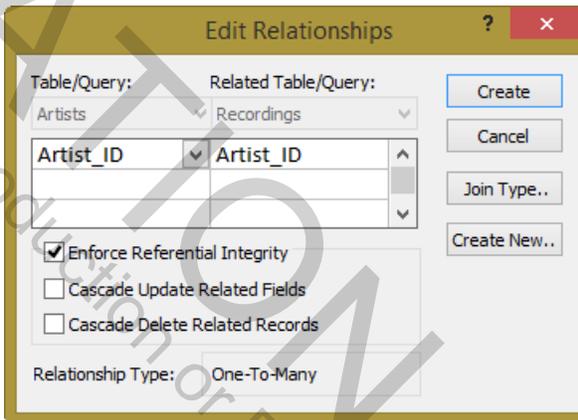


The **Edit Relationships** dialog box opens.

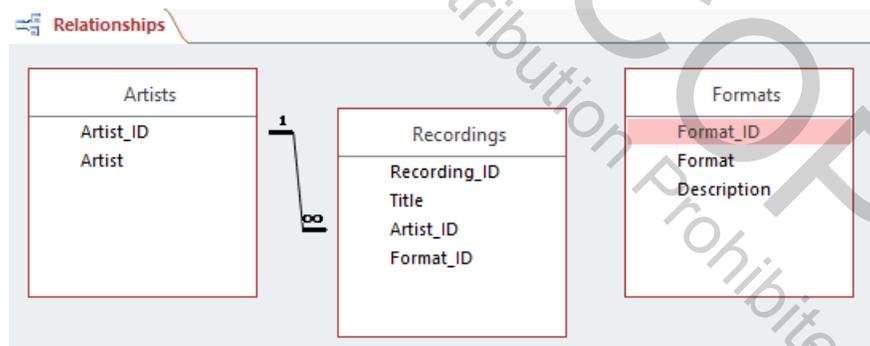
Relationships



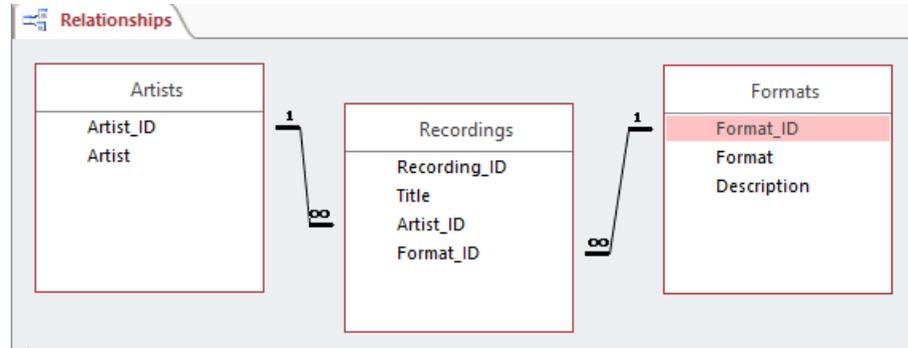
7. Mark the **Enforce Referential Integrity** check box. We'll leave the **Cascade Update Related Fields** and **Cascade Delete Related Records** check boxes cleared.



8. Click **Create**. A connector is added between the tables.



9. Repeat steps 5-7 to relate the `Format_ID` field in the Recording Formats table to the `Format_ID` field in the Recordings table.



10. Click **Save**.

1.4 A Few Words about Naming Conventions

In this course we will not impose a structure on the names of our database objects. This will make it more natural to refer to database objects in context. However, for larger or more complex databases you will want to consider using a naming

Relationships

convention to help you distinguish among objects. Using a naming convention is particularly helpful if other people may maintain your application.

A commonly used convention for Access databases is the Leszynski/Reddick naming convention. Briefly, this convention adds a tag in lower case letters before the object name and omits all spaces.

Object Type	Tag	Example
Table	tbl	tblRecordings
Table Lookup	tlkp	tlkpFormats
Query	qry	qryCDRecordings
Action Query	<ul style="list-style-type: none">• qapp (append)• qxtb (crosstab)• qdel (delete)• qmak (make table)• qry or qsel (select)• qupd (update)	qappRecordings
Form	frm	frmRecordingEntry
Subform	sfrm	sfrmCompilations
Report	rpt	rptMusicList
Subreport	srpt	srptCompilations
Macro	mcr	mcrAddRecordings
Command	cmd	cmdOpenRecordingsForm

A variant of the Leszynski/Reddick convention includes an underscore between the tag name and the object name: tbl_Recordings.

A similar naming convention has the advantage of making it easy to distinguish among object types like the Leszynski/Reddick convention does, but has the added

benefit of being easier to search. By this convention we append a tag in upper case letters to the end of the object name while omitting all spaces.

Object Type	Tag	Example
Table	TBL	RecordingsTBL
Table Lookup	LKUP	FormatsLKUP
Query	QRY	CDRecordingsQRY
Action Query	<ul style="list-style-type: none"> • APPEND_ObjectNameQRY • XTAB_ObjectNameQRY • DELETE_ObjectNameQRY • MAKE_ObjectNameQRY • SELECT_ObjectNameQRY • UPDATE_ObjectNameQRY 	APPEND_RecordingsQRY
Form	FRM	RecordingEntryFRM
Subform	SFRM	CompilationsSFRM
Report	RPT	MusicListRPT
Subreport	SRPT	CompilationsSRPT
Macro	MCR	AddRecordingsMCR
Command	CMD	OpenRecordingsCMD

Whichever convention you choose, it is important to use it consistently across your application.

Exercise 1 Creating Relationships

15 to 45 minutes

In this exercise, you will add an Accounts table to the Bank Register database, add a field for the foreign key to the Transactions table, and formalize the relationship between the Accounts table and the Transactions table. Open Relationships/Exercises/Bank Register.accdb to begin.

The Accounts table will store the following information:

Account_ID	RoutingNumber	AccountNumber	AccountName
1	112500749	006400315678	Checking
2	112500749	006400267891	Savings

All the transactions entered thus far in the database are for the checking account.

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Relationships

Exercise Solution

To add the table to the database:

1. Open the database.
2. On the **Create** tab in the **Tables** group, click **Table Design**. A new table opens in Design view.
3. In the **Field Name** column in the first row, type "Account_ID".
4. In the **Data Type** column, select "AutoNumber".
5. In the **Description** field, type "Record number automatically assigned by Access."
6. In the **Field Properties** area on the **General** tab, in the **Caption** field, type "Account_ID".
7. From the **Indexed** drop-down list, select "Yes (No Duplicates)".
8. In the next row of the field definition area, enter the following information for the Routing Number field:

Field Name: RoutingNumber

Data Type: Short Text

Description: Enter the routing number for the bank.

9. In the **Field Properties** area on the **General** tab, enter values for the following properties:

Field Size: 9

Caption: Routing Number

Required: Yes

Indexed: Yes (Duplicates OK)

10. In the next row of the field definition area, enter the following information for the Account Number field:

Field Name: AccountNumber

Data Type: Short Text

Description: Enter the bank account number.

11. In the **Field Properties** area on the **General** tab, enter values for the following properties:

Field Size: 12

Caption: Account Number

Required: Yes

Indexed: Yes (Duplicates OK)

12. In the next row of the field definition area, enter the following information for the Account Name field:

Field Name: AccountName

Data Type: Short Text

Description: Enter a name for the bank account.

13. In the **Field Properties** area on the **General** tab, enter values for the following properties:

Field Size: 40

Caption: Account Name

14. In the field definition area, highlight the Account_ID row.

15. On the **Table Tools: Design** tab in the **Tools** group, click **Primary Key**.

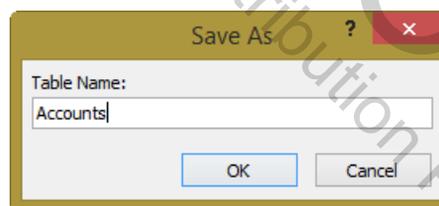
Field Name	Data Type	Description (Optional)
Account_ID	AutoNumber	Record number automatically assigned by Access.
RoutingNumber	Short Text	Enter the routing number for the bank.
AccountNumber	Short Text	Enter the bank account number.
AccountName	Short Text	Enter a name for the bank account.

Property	Value
Field Size	Long Integer
New Values	Increment
Format	
Caption	
Indexed	Yes (No Duplicates)
Text Align	General

A field name can be up to 64 characters long, including spaces. Press F1 for help on field

16. Click **Save**. The **Save As** dialog box opens.

17. In the **Table Name** field, type "Accounts".



18. Click **OK**.

19. Switch to Datasheet view and add the records specified above.

20. When you finish, close the table.

To add a foreign key field to the Transactions table:

Relationships

1. Open the Transactions table in Design view.
2. In the field definition area, highlight the Code row and on the **Table Tools: Design** tab in the **Tools** group, click **Insert Rows**.

Field Name	Data Type	Description (Optional)
TransID	AutoNumber	Record number automatically assigned by Access.
Code	Short Text	Enter a transaction code or check number.
Credit	Yes/No	Mark this checkbox if this is a credit transaction.
TransDate	Date/Time	Enter the transaction date.
Description	Short Text	Enter the payee or a description of the transaction.
Amount	Currency	Enter the amount of the transaction.
Memo	Short Text	Enter a memo about the transaction (optional).
Cleared	Yes/No	Mark this checkbox if the transaction has cleared the

Field Properties

General Lookup

3. In the row you just inserted in the **Field Name** field, type "Account_ID".
4. In the **Data Type** field, select "Number".
5. In the **Description** field, type "Foreign key to Accounts table."
6. In the **Field Properties** area on the **General** tab, enter a value for the following property:

Caption: Account ID

7. Click **Save**.

Field Name	Data Type	Description (Optional)
TransID	AutoNumber	Record number automatically assigned by Access.
Account_ID	Number	Foreign key to Account table.
Code	Short Text	Enter a transaction code or check number.
Credit	Yes/No	Mark this checkbox if this is a credit transaction.
TransDate	Date/Time	Enter the transaction date.
Description	Short Text	Enter the payee or a description of the transaction.
Amount	Currency	Enter the amount of the transaction.
Memo	Short Text	Enter a memo about the transaction (optional).
Cleared	Yes/No	Mark this checkbox if the transaction has cleared the

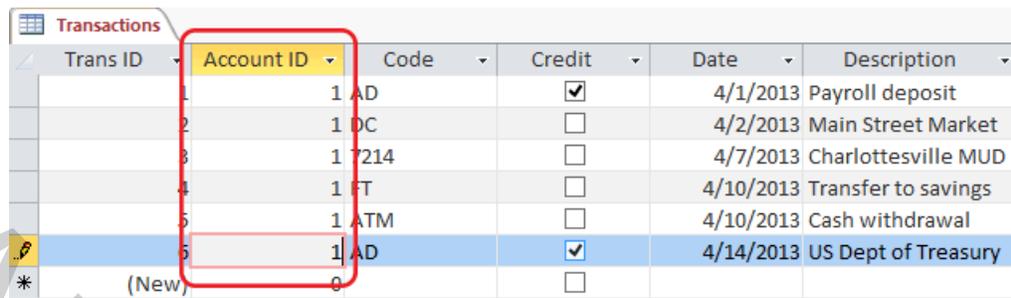
Field Properties

Property	Value
Field Size	Long Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	Account ID
Default Value	0
Validation Rule	
Validation Text	

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

8. Switch to Datasheet view.

9. In the Account_ID column, fill in each row with "1".



The screenshot shows a table titled 'Transactions' with the following columns: Trans ID, Account ID, Code, Credit, Date, and Description. A red box highlights the 'Account ID' column. The data rows are as follows:

Trans ID	Account ID	Code	Credit	Date	Description
1	1	AD	<input checked="" type="checkbox"/>	4/1/2013	Payroll deposit
2	1	DC	<input type="checkbox"/>	4/2/2013	Main Street Market
3	1	7214	<input type="checkbox"/>	4/7/2013	Charlottesville MUD
4	1	FT	<input type="checkbox"/>	4/10/2013	Transfer to savings
5	1	ATM	<input type="checkbox"/>	4/10/2013	Cash withdrawal
6	1	AD	<input checked="" type="checkbox"/>	4/14/2013	US Dept of Treasury
*(New)	0		<input type="checkbox"/>		

10. Switch to Design view.

Relationships

- With the Account_ID row selected in the field definition area, go to the **Field Properties** area on the **General** tab and change the **Required** value to "Yes".

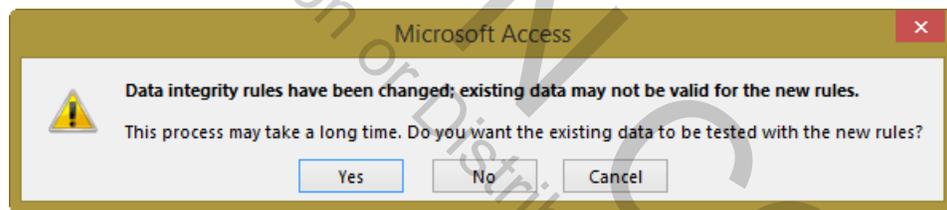
Field Name	Data Type	Description (Optional)
TransID	AutoNumber	Record number automatically assigned by Access
Account_ID	Number	Foreign key to Account table.
Code	Short Text	Enter a transaction code or check number.
Credit	Yes/No	Mark this checkbox if this is a credit transaction.
TransDate	Date/Time	Enter the transaction date.
Description	Short Text	Enter the payee or a description of the transaction.
Amount	Currency	Enter the amount of the transaction.
Memo	Short Text	Enter a memo about the transaction (optional).
Cleared	Yes/No	Mark this checkbox if the transaction has cleared.

Field Properties

Field Name	Data Type
Account_ID	Long Integer
Field Size	Long Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	Account ID
Default Value	0
Validation Rule	
Validation Text	
Required	Yes
Indexed	Yes (Duplicates OK)
Text Align	General

Require data entry in this field?

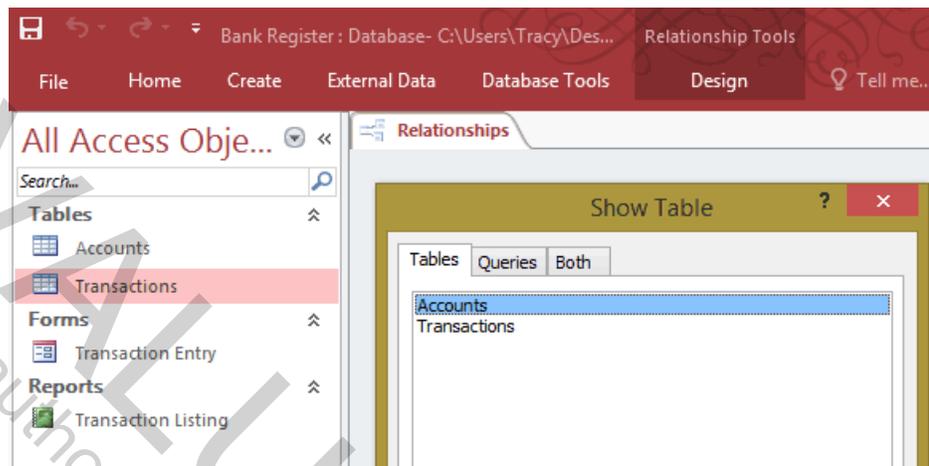
- Click **Save**. You are prompted about data integrity issues.



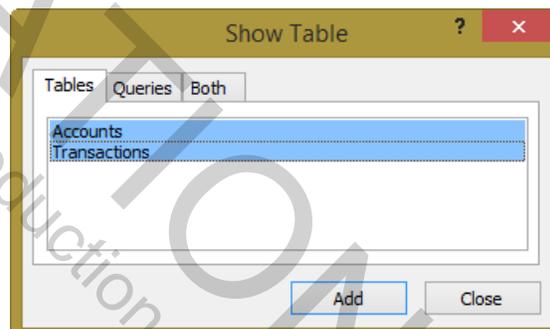
- Click **Yes**.
- Close the Transactions table.

To formalize the relationship between the Accounts table and the Transactions table:

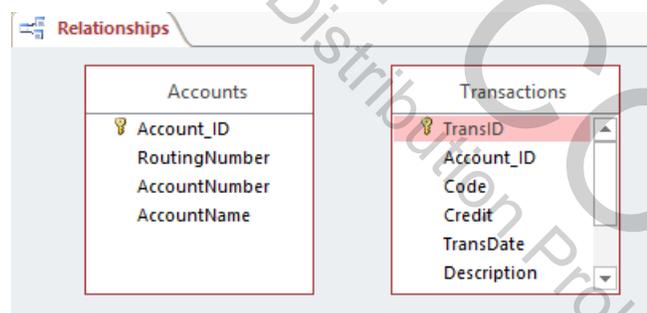
1. On the **Database Tools** tab, click **Relationships**. The **Show Table** dialog box opens.



2. On the **Tables** tab, highlight the Accounts and Transactions tables, then click **Add**.

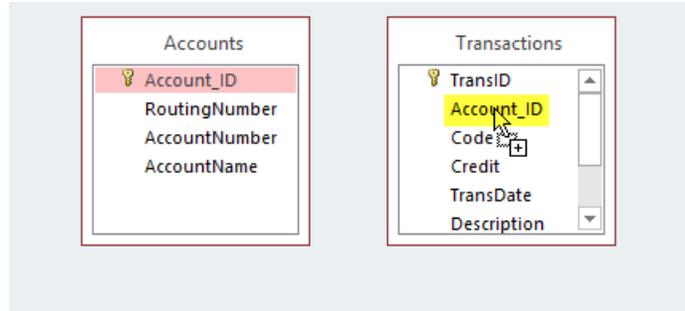


3. Click **Close**. Representations of the tables are added to the **Relationships** tab in the workspace.

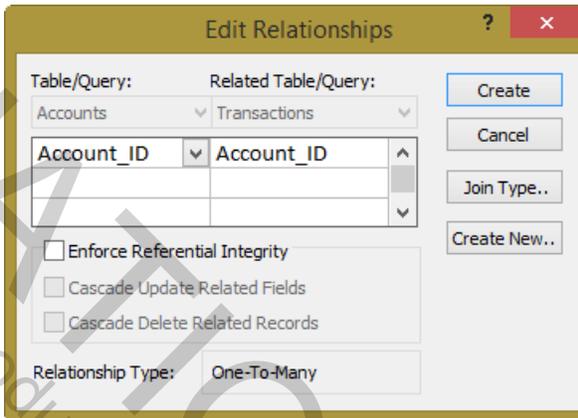


4. Highlight the **Account_ID** field in the Accounts table and drag and drop it onto the **Account_ID** field in the Transactions table.

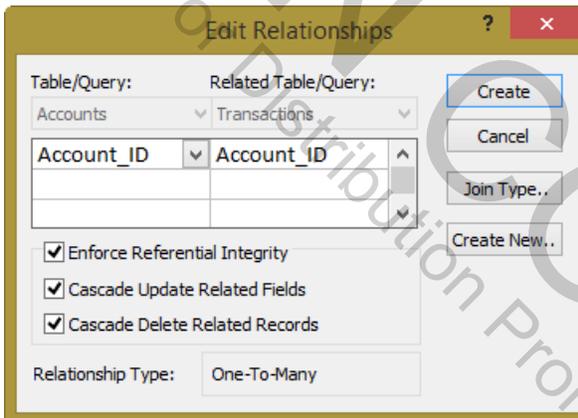
Relationships



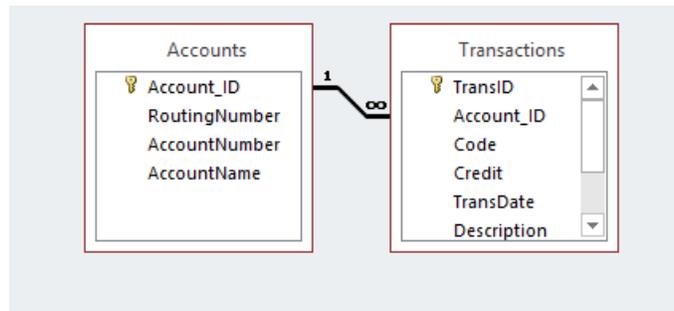
The **Edit Relationships** dialog box opens.



5. Mark the **Enforce Referential Integrity** check box. Also mark the **Cascade Update Related fields** and the **Cascade Delete Related Records** check boxes.



- Click **Create**. A connector is added between the tables.



- Click **Save**.

1.5 Conclusion

In this lesson, you learned:

- About referential integrity.
- How to establish relationships between tables.

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5. Reports

In this lesson, you will learn...

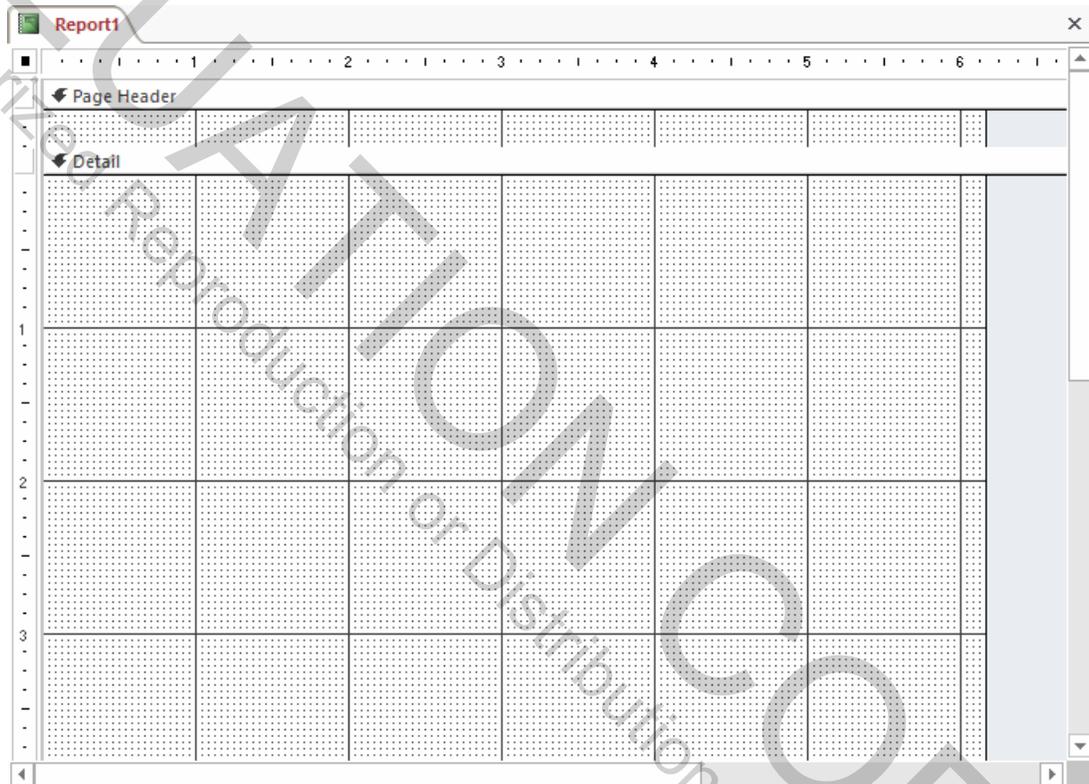
1. To create reports in Design view.
2. About the sections of a report.
3. To add fields to a report.
4. To move, resize, and format the objects on a report.
5. To manipulate the page header/footer, the report header/footer, and group headers/footers on a report.
6. To group and sort records on a report.
7. To work with report, section, and object property sheets.

5.1 Design View

Many of the techniques we learned in the forms lesson will apply as we learn to design reports. In particular, the methods for moving, resizing, and formatting objects are identical.

As with forms, Design view gives you the maximum control over the aesthetics and performance of your reports. Files are located Reports Advanced/Demos/Demo - My Music Collection - Start.accdb.

To start a report in Design view, go to the **Create** tab in the **Reports** group and click **Report Design**. A blank design tab opens on the work surface.

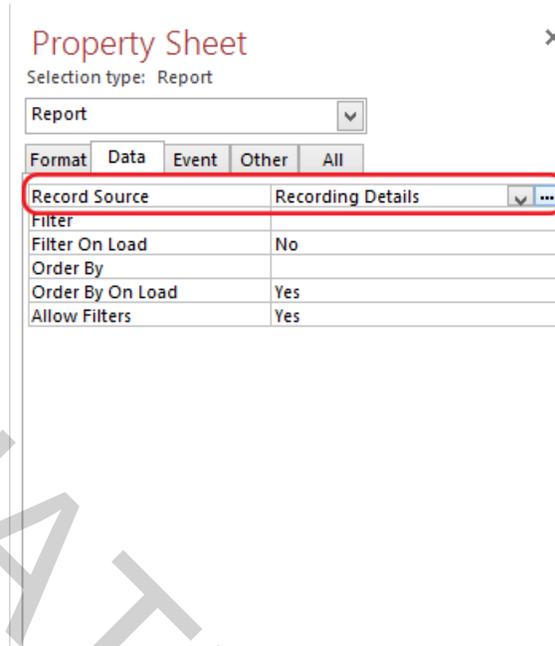


Name and save the form. (We'll name the report "Music List".)

Next, we need to give our report a record source. To do this we'll use the "Record Details" query that we created in the forms lesson.

1. To associate the query with the report, right-click in the design surface and select **Report Properties** from the shortcut menu.

- From the **Record Source** drop-down list, select "Recording Details".



- Close the property sheet.

Note: You may make a copy of a report that you have made, assuming you like the layout and formatting and then change the source as a shortcut way to reuse existing reports. If you have different field names, those will need to be added, modified, or deleted in the report to match the new source.

5.2 Report Sections

Reports have three standard sections: page header, detail, and page footer. In addition, you can add group header/footer and report header/footer sections.

Report Header

If you include the optional report header section, it is visible on the first page of the report only. You can use it for report information that only needs to appear once on the report such as a logo, title, and date. The report header and footer are paired, so when you add one to the form, you add them both.

Page Header

The page header section appears at the top of each page of the report. For a tabular report, the page header is a good place for column headings.

Group Header

If you group the data in your report, Access adds a group header section that is visible before each new grouping on the report. You can use it to print the group name for each grouping on the report. There can be multiple group headers on the report depending on how many grouping levels you include.

Detail

The detail section contains one record for each row in the record set. This is the main section of the report.

Group Footer

If you include group totals on a report, the group footer section appears at the end of each grouping on the report. The group footer typically shows summary information for each group. There can be multiple group footers on a report depending on how many grouping levels you include.

Page Footer

The page footer appears at the bottom of each page of a report. The page footer usually contains page numbers.

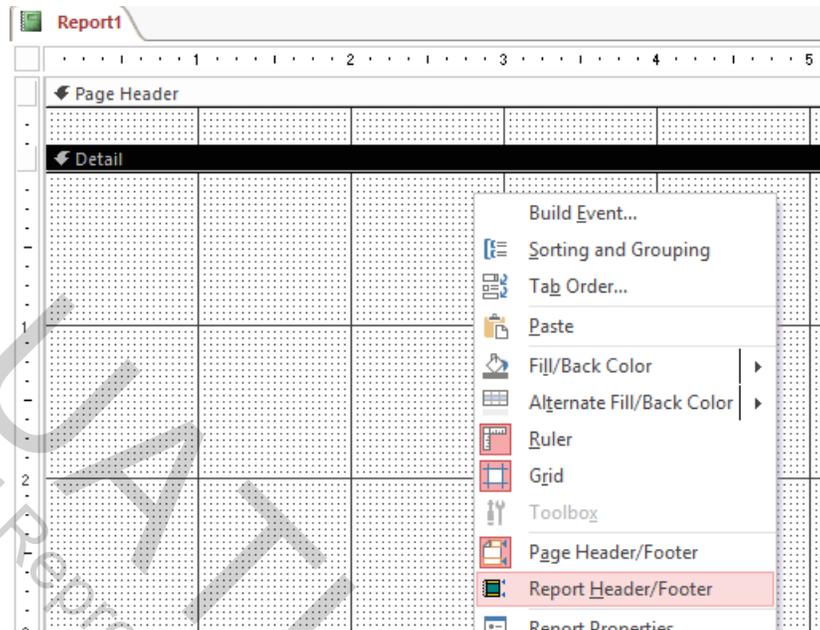
Report Footer

If you include the optional report footer section, it appears once at the end of the report. The report footer contains summary information for the entire report. For example, the report footer might be used to show report grand totals.

Adding a Report Header/Footer

To add report header/footer sections to a report:

1. Display the report in Design view.
2. Right-click on the design surface and select **Report Header/Footer** from the shortcut menu.



The report header and footer are added to the design surface.

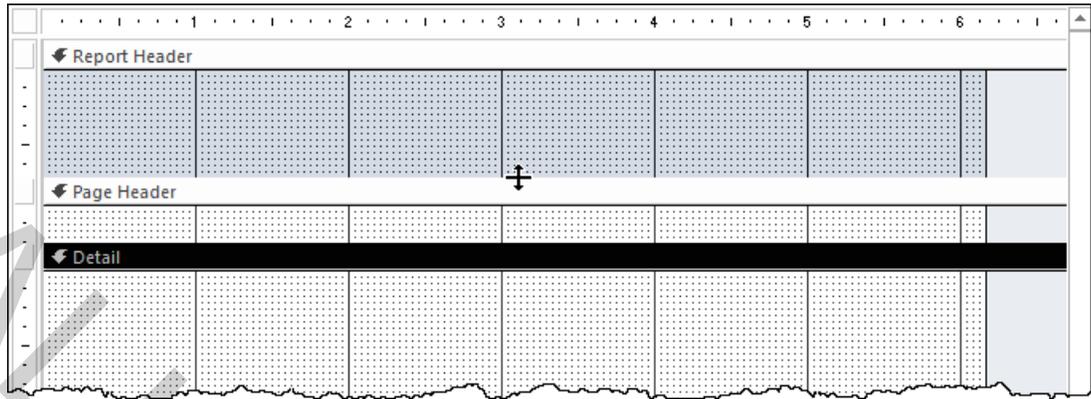


Adding a Logo to the Report Header

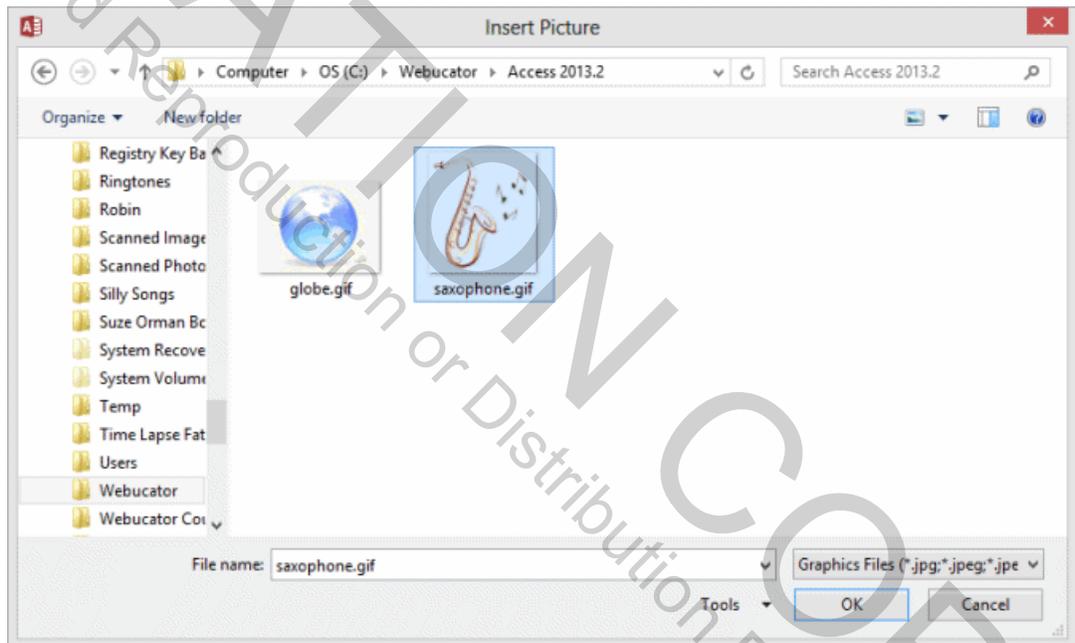
To add a logo to the report header:

Reports

1. Resize the header section as needed to accommodate the logo.

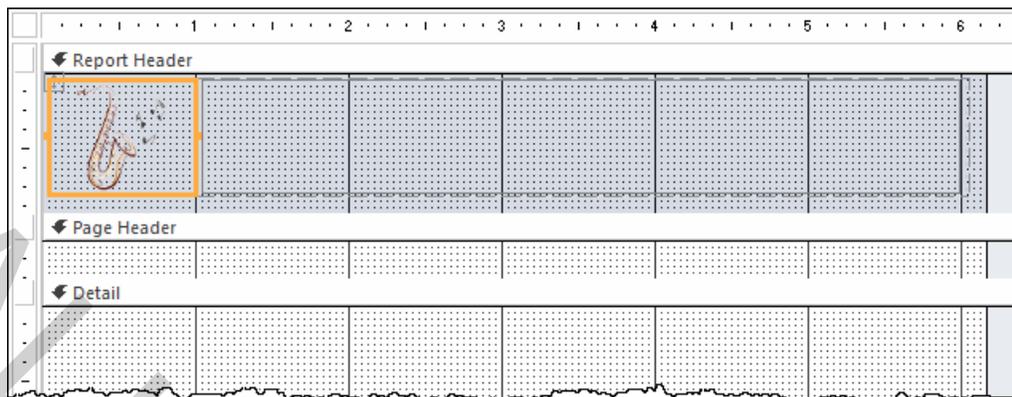


2. On the **Report Design Tools: Design** tab in the **Header/Footer** group, click **Logo**.
3. Navigate to and select the logo file.

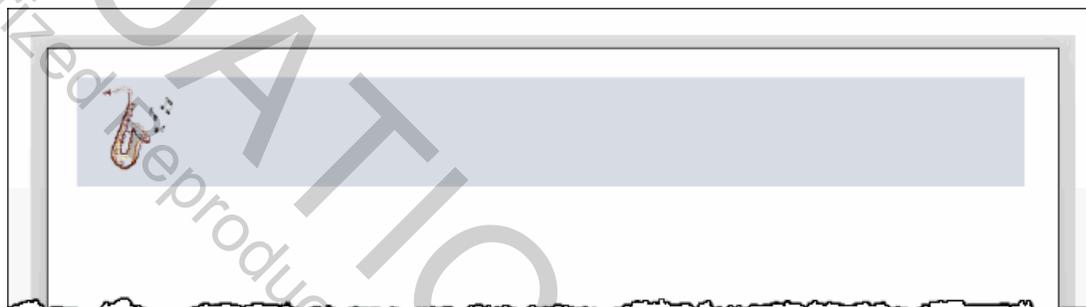


4. Click **OK**. The logo is added to the report header area.

5. Move and resize the logo as needed.



6. Switch to Print Preview to preview the logo.



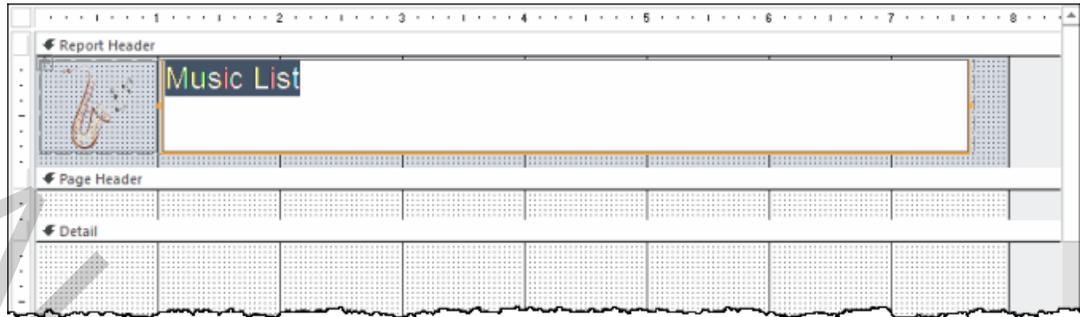
7. When you finish, click **Close Print Preview**.

Adding a Title to the Report Header

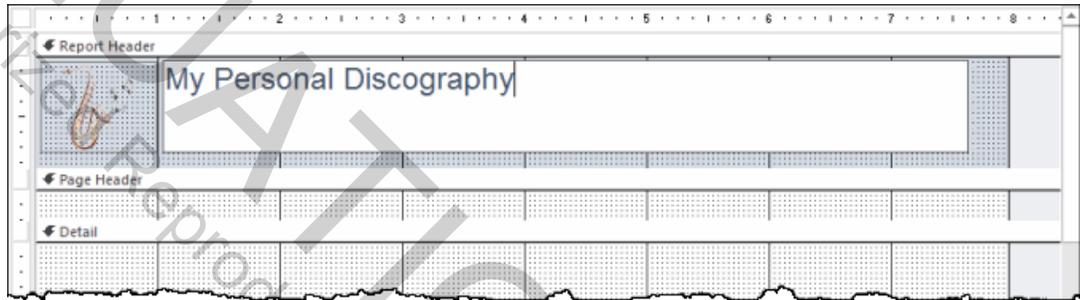
To add a title to the report header:

Reports

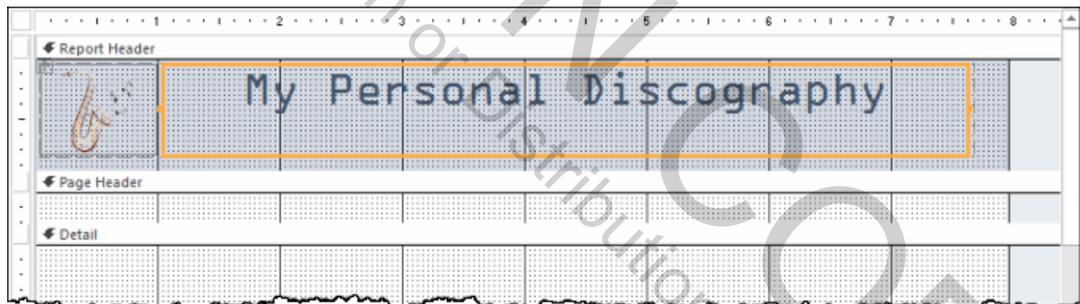
1. In Design view, on the **Report Design Tools: Design** tab in the **Header/Footer** group, click **Title**.



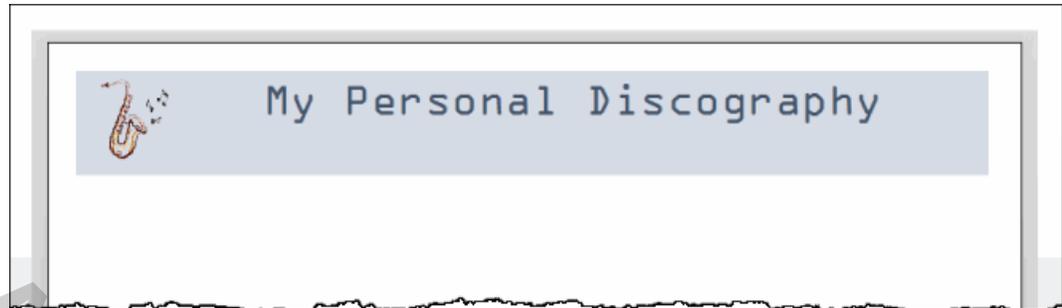
2. Type the title for the report.



3. Go to the **Report Design Tools: Format** tab and make any formatting changes you want.



4. Return to the **Report Design Tools: Design** tab, then switch to Print Preview to preview the report.



5. When you finish previewing the report, click **Close Print Preview**.

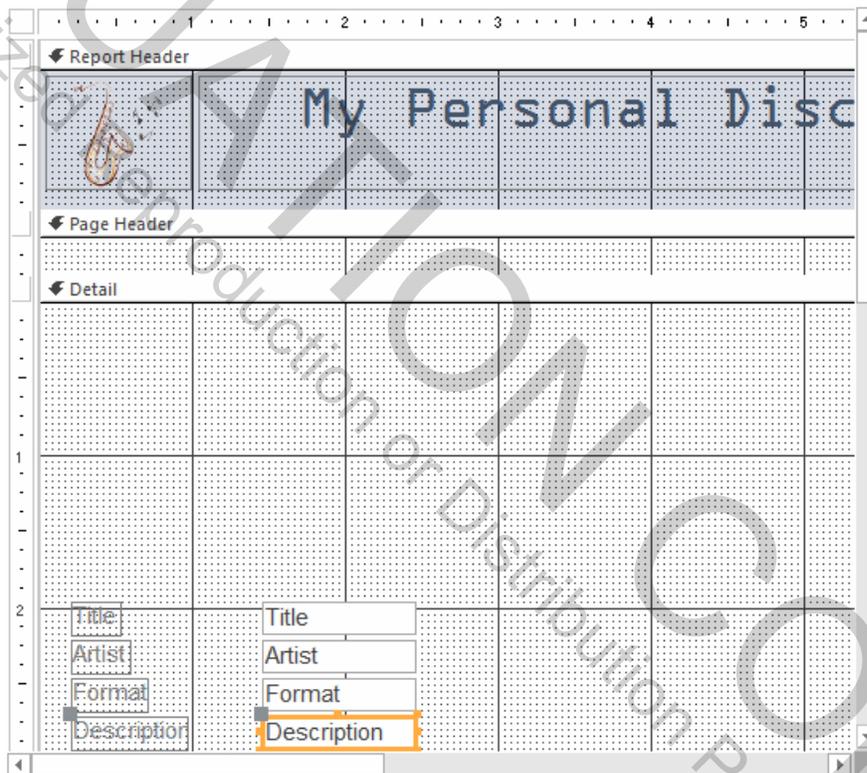
Adding Fields to a Report

Next, we'll add some content to the report by adding fields to the design surface.

To add fields to the report:

Reports

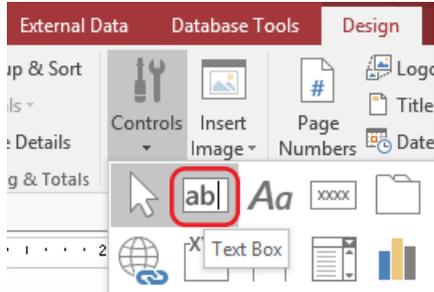
1. On the **Report Design Tools: Design** tab in the **Tools** group, click **Add Existing Fields**.
2. In the **Field List** pane, double-click the field names you need to add them to the design surface.



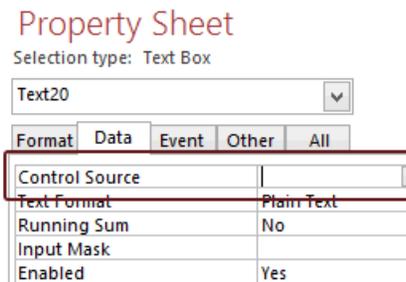
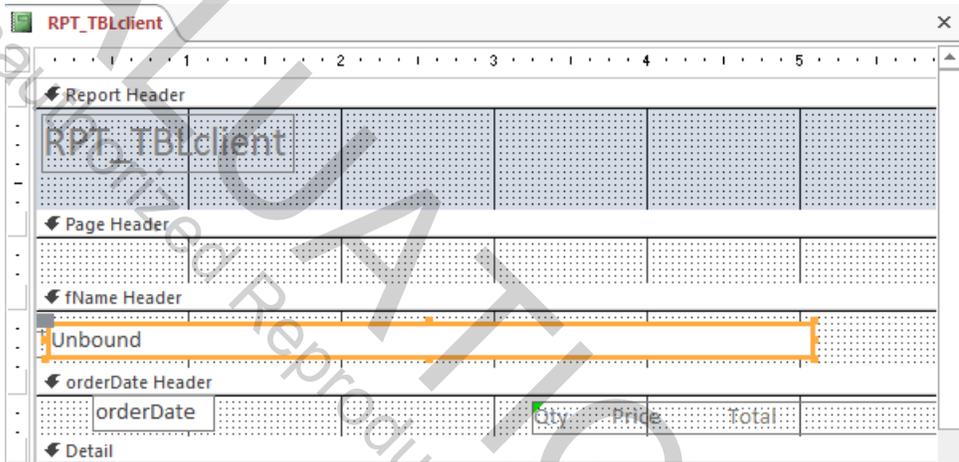
Add Calculated Fields

When the data you need is not directly available in the field list, then you must create a calculated field (formula) to display the data wanted.

1.

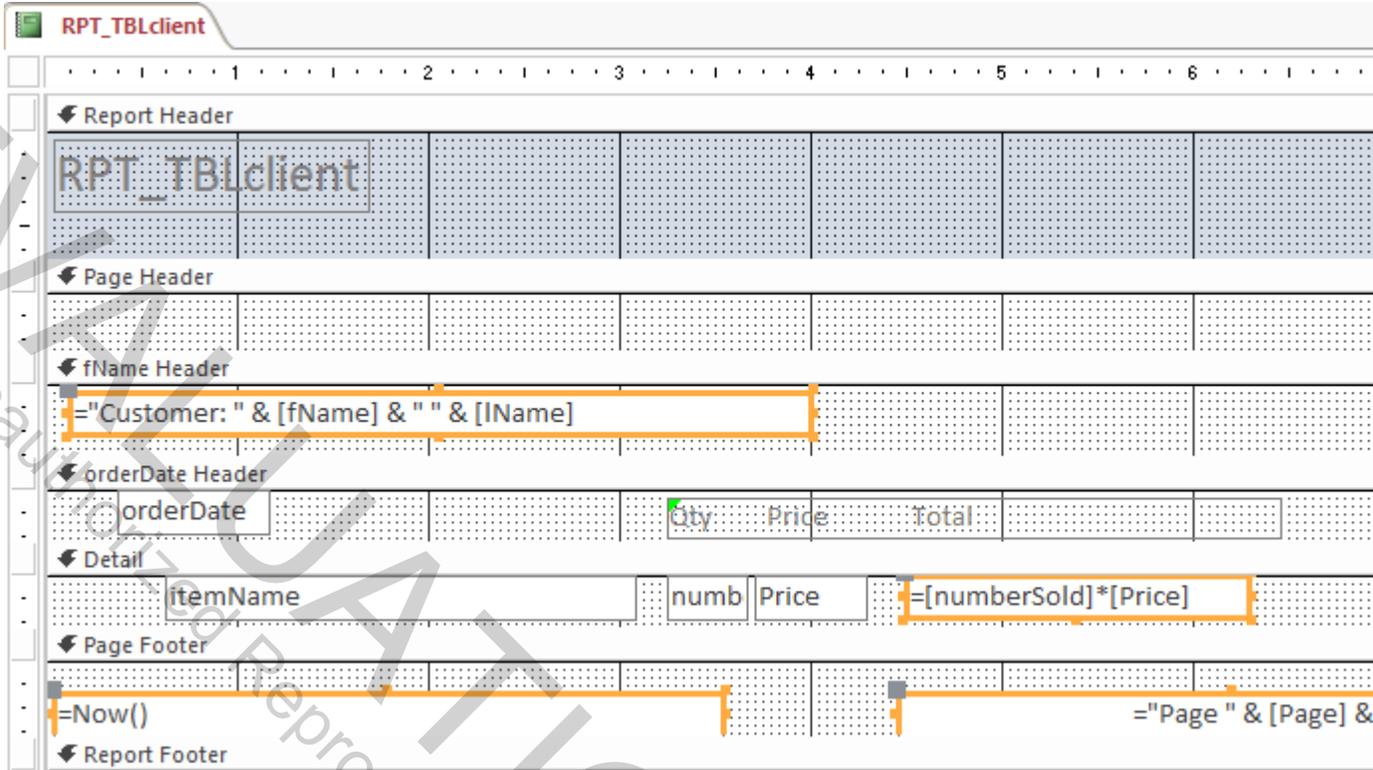


Design > Controls > Text Box



Enter the formula into the **Data Tab > Control Source** area.

3.

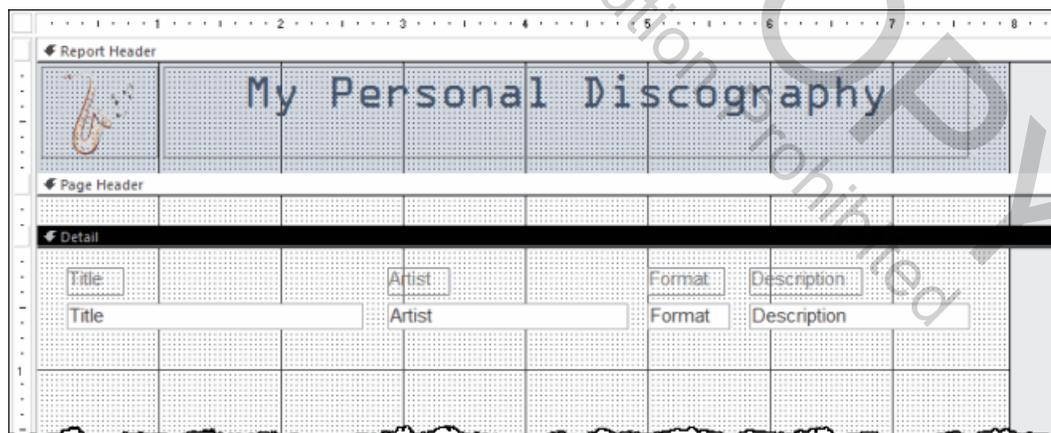


The finished report may look similar.

5.3 Arranging Fields on a Report

As with forms, Access adds the fields in the order you selected them and stacks them. For this report, we want a tabular layout, so we'll adjust the layout accordingly.

The same techniques for moving and resizing fields on a form apply to reports. This time, however, we're going to stack the labels on top of their corresponding fields.



If needed, remember to use the **Report Design Tools: Arrange** tab to apply alignment and spacing to the report objects.

Use the **Report Design Tools: Format** tab to apply formatting to the report objects.

Preview your work as necessary to ensure you are achieving the results you want.



The screenshot shows a report titled "My Personal Discography" with a blue header bar and a red musical note icon. Below the header is a table with the following data:

Title	Artist	Format	Description
Skyfall	Adele	MP3	MP3 file

5.4 Resizing the Detail Section

When you previewed the report, you may have noticed that the report is displaying one record per page. The Detail section needs to be only as tall as the height of one

Reports

record plus any spacing you want to allow between records. For this reason, we need to resize the height of the Detail section.

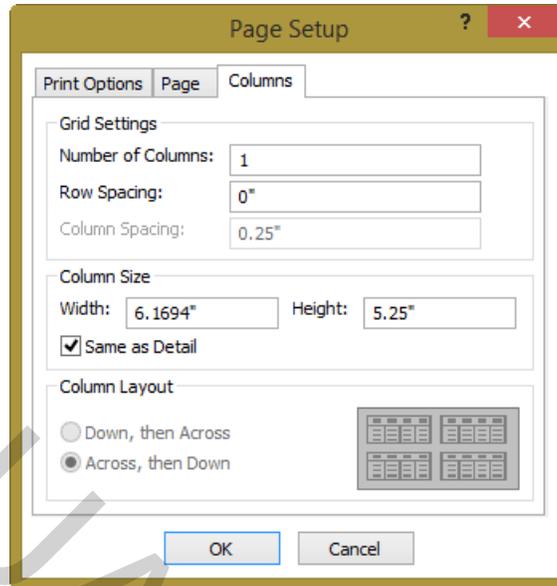
The screenshot shows a report design tool interface. At the top, there is a 'Report Header' section with a logo and the title 'My Personal Discography'. Below this is a 'Page Header' section. The main body is a 'Detail' section containing a table with four columns: 'Title', 'Artist', 'Format', and 'Description'. Below the table is a 'Page Footer' section, and at the very bottom is a 'Report Footer' section. The table is currently empty, showing only the column headers.

When we preview the report now, we see that there are multiple records per page.

The screenshot shows a preview of the report. The title 'My Personal Discography' is at the top. Below it is a table with four columns: 'Title', 'Artist', 'Format', and 'Description'. The table contains five rows of data:

Title	Artist	Format	Description
Skyfall	Adele	MP3	MP3 file
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
I Got a Name	Jim Croce	8-tr	8-track tape
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record

To create multiple columns in a report, you may choose **Page Setup > Page Layout > Columns**. Choose the proper settings, and click **OK**.



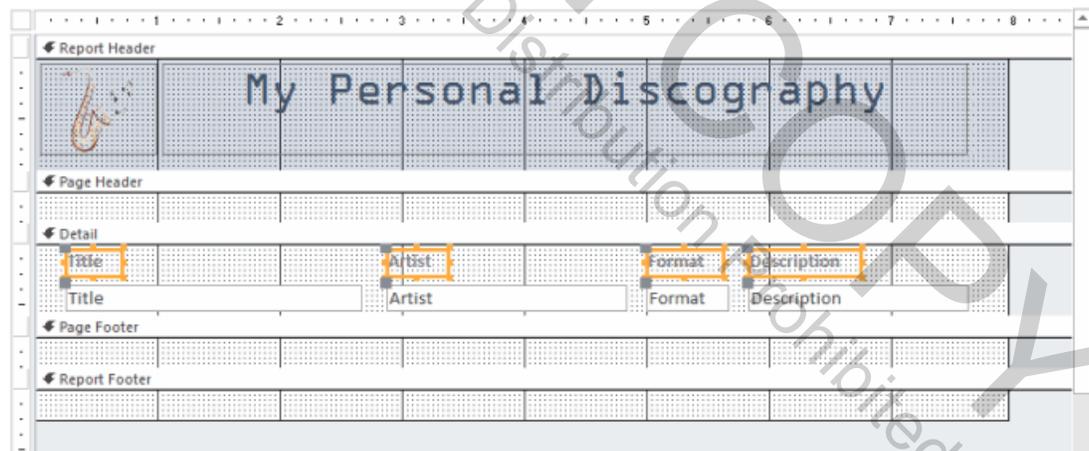
Eliminating Repeating Headings

You may have noticed that the labels in our example repeat for every record. That's because the labels are included in the Detail section of the report.

We can move the labels to the Page Header if we want them to print just once at the top of every page of detail.

To do so:

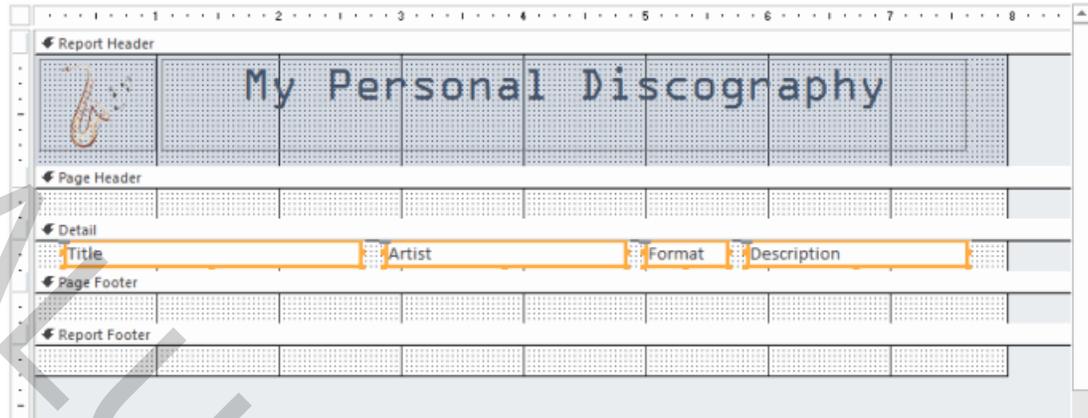
1. In **Design view**, select all the labels.



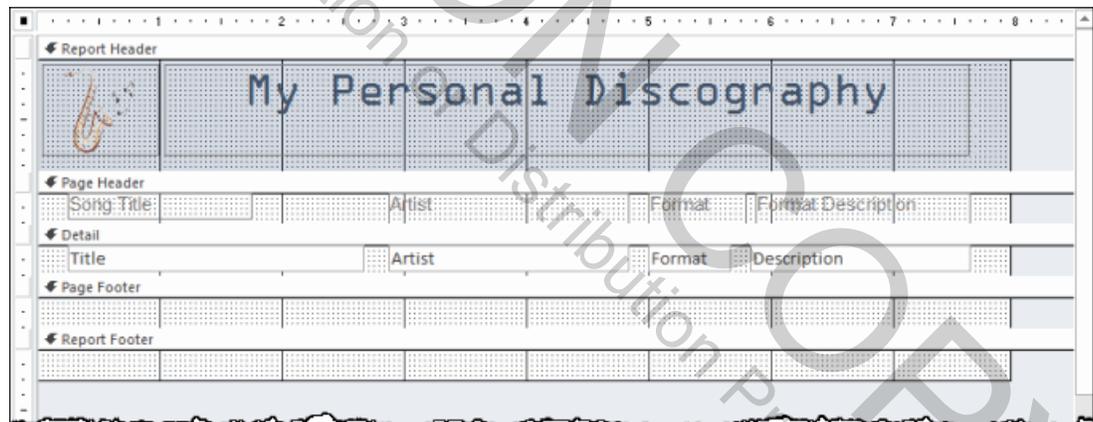
2. Press **Delete**.

Reports

3. Move the fields up and resize the Detail section to account for the extra space caused by deleting the labels.



4. On the **Report Design Tools: Design** tab in the **Controls** group, click **Aa**.
The cursor changes to .
5. In the Page Header, click and drag a rectangle above the first field to create a label.
6. In the label, type the text you want to appear above the corresponding detail column.
7. Repeat steps 4-6 for each of the labels you need to add.



8. After you add the labels you need, tweak the sizing and placement as needed.

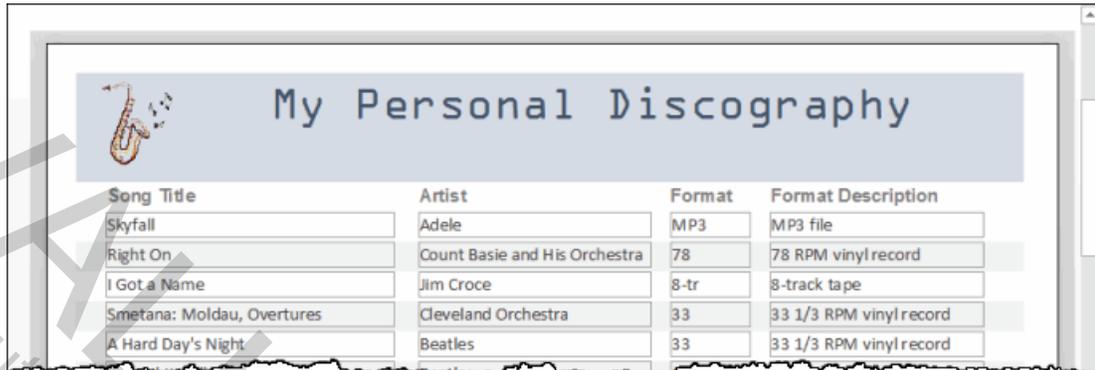
Tip: You can *move* selected objects by small increments by pressing **Ctrl** and the arrow on your keyboard that corresponds to the direction you want to move.

Tip: You can *resize* selected objects by small increments by pressing **Shift** and the arrow on your keyboard that corresponds to the direction in which you want to resize.

Tip: You can use the **Size/Space** options on the **REPORT DESIGN TOOLS: ARRANGE** tab to quickly equalize the size of several objects. For instance, if you want to make all the labels the same height as the shortest label, you would select **Size/Space > To Shortest** from the menu.

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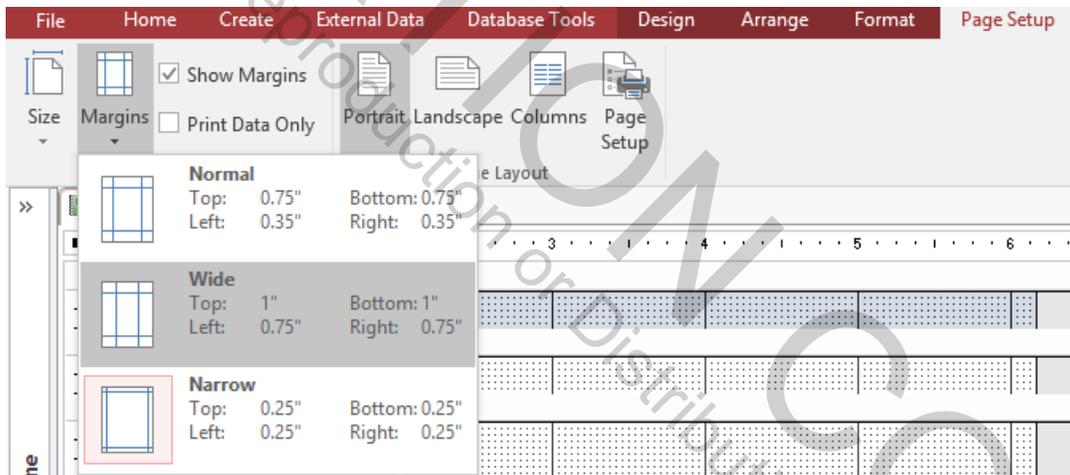
9. Perform any formatting changes you want to make to the labels.
10. When you finish, preview your results.



Song Title	Artist	Format	Format Description
Skyfall	Adele	MP3	MP3 file
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
I Got a Name	Jim Croce	8-tr	8-track tape
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record

Set Margins

Margins will affect the amount of information that will be displayed in the printed page. [Page Setup > Page Size > Margins](#).

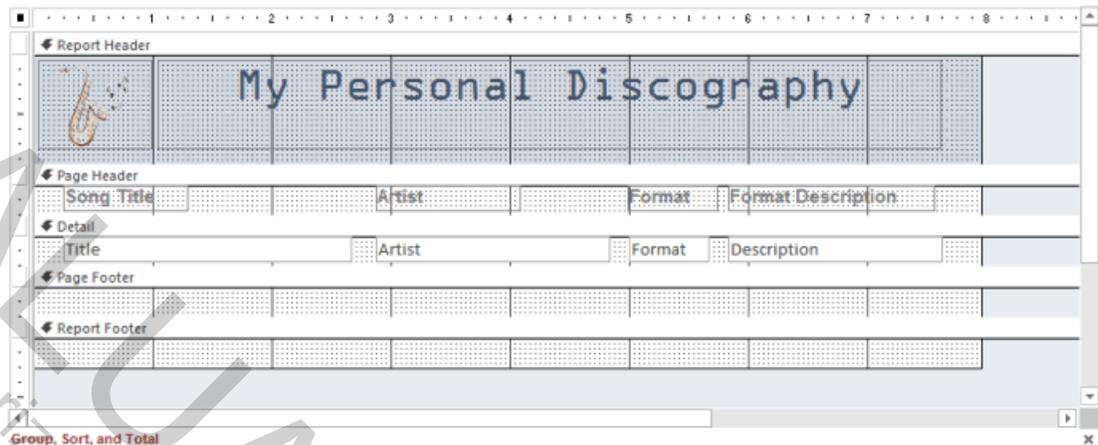


5.5 Grouping and Sorting

You can control how the information on the report is grouped and how data within those groups is sorted.

First, you can sort without grouping. To do so:

1. On the **Report Design Tools: Design** tab in the **Grouping & Totals** group, click **Group & Sort**. The **Group, Sort, and Total** pane appears at the bottom of the window.



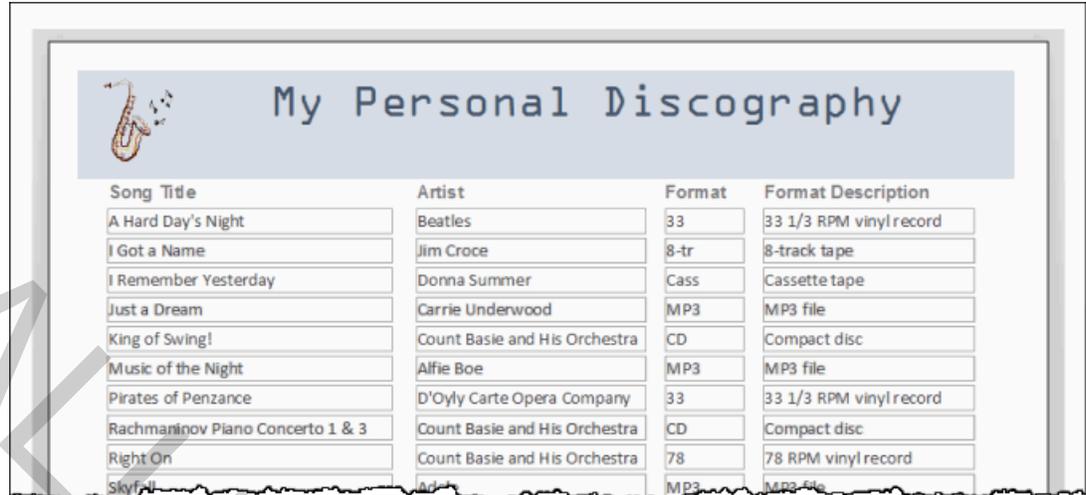
2. Click **Add a sort**. A list of fields you can sort by displays.



3. Select a field to sort by.



4. Preview the report. Notice that the report is sorted alphabetically by the column you selected.



The screenshot shows a report titled "My Personal Discography" with a saxophone icon. The report contains a table with four columns: Song Title, Artist, Format, and Format Description. The data is as follows:

Song Title	Artist	Format	Format Description
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
I Got a Name	Jim Croce	8-tr	8-track tape
I Remember Yesterday	Donna Summer	Cass	Cassette tape
Just a Dream	Carrie Underwood	MP3	MP3 file
King of Swing!	Count Basie and His Orchestra	CD	Compact disc
Music of the Night	Alfie Boe	MP3	MP3 file
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Rachmaninov Piano Concerto 1 & 3	Count Basie and His Orchestra	CD	Compact disc
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
Skyfall	Adel	MP3	MP3 file

To group and sort the report:

1. In Design view, clear the sorting you just applied by clicking **X** at the end of the **Sort by** line in the **Group, Sort, and Total** pane.
2. Click **Add a group**.

- From the drop-down list, select the field to group by.



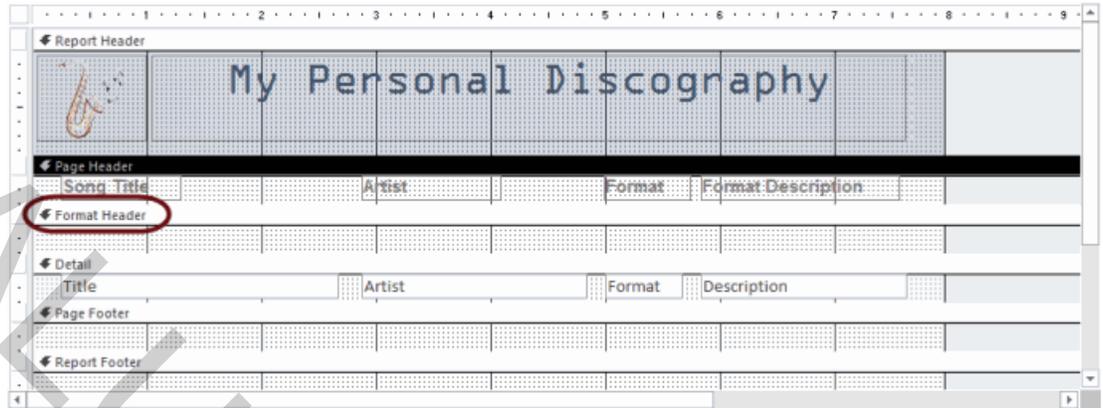
- Preview the report. Notice how the report is grouped.

Song Title	Artist	Format	Format Description
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
I Got a Name	Jim Croce	8-tr	8-track tape
I Remember Yesterday	Donna Summer	Cass	Cassette tape

- Back in Design view, notice that Access has added a group header section (called "Format Header" in our example). This is causing gaps between the groupings in the report. If we don't want to include a group heading, we can

Reports

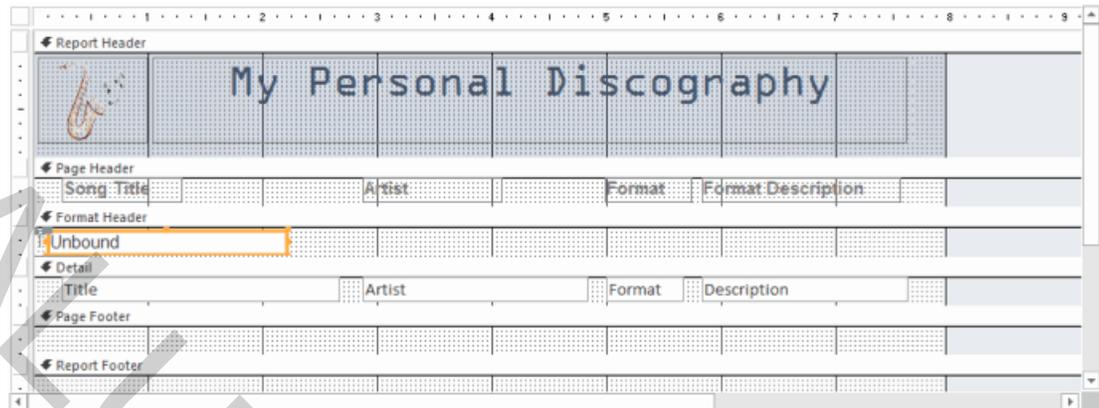
resize the group header so that it doesn't take up any space. However, let's add a label that shows the group name instead.



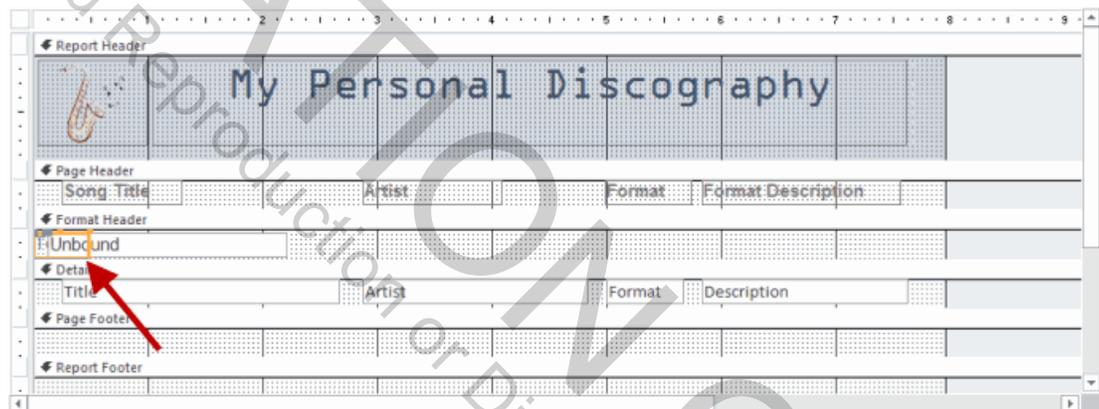
6. On the **Report Design Tools: Design** tab in the **Controls** group, click .

The cursor changes to .

- Click and drag a rectangle in the group header section. This is the text box we will use to add the group names.



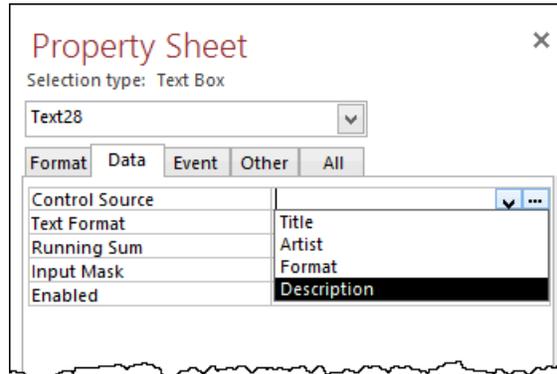
- The text box has a label with it that we will not need. Click on the left side of the text box to select it. (It may be a bit difficult to find.)



- Press **Delete**.
- Notice that the text box is labeled "Unbound". This means there is no data tied to the text box at this time. For our example, we want to bind the text box to the Format Description field.
- Right-click on the text box and select **Properties** from the shortcut menu. The property sheet for the text box opens.

Reports

- On the **Data** tab, from the **Control Source** drop-down list, select the field to bind to the text box.



- Close the property sheet.

14. Preview the report. Notice that each group now starts with a group name.

Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
8-track tape			
I Got a Name	Jim Croce	8-tr	8-track tape
Cassette tape			
Remember Yesterday	Donna Summer	Cass	Cassette tape

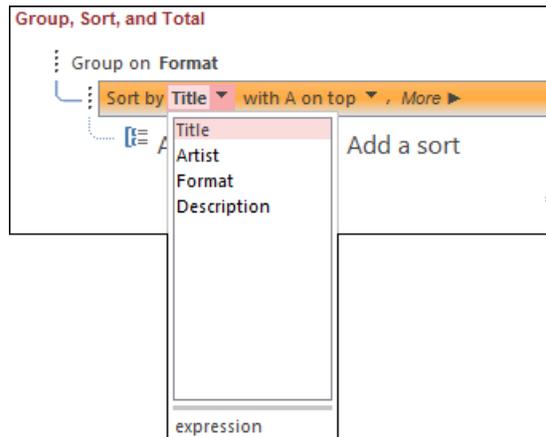
15. Format the text box and resize the group header section to achieve the look you desire.

Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
8-track tape			
I Got a Name	Jim Croce	8-tr	8-track tape
Cassette tape			
Remember Yesterday	Donna Summer	Cass	Cassette tape

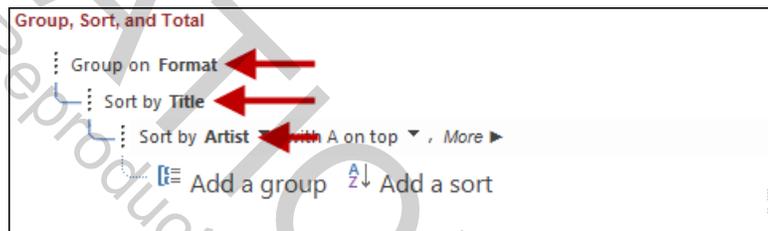
16. Now, to sort the data within each group, go to the **Group, Sort, and Total** pane and click **Add a sort**.

Reports

17. From the drop-down list, select the field to sort by.



18. If you want to sort by a second field, click **Add a sort** again and select another field.



19. Preview your report. Notice the grouping and sorting.

Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
8-track tape			
I Got a Name	Jim Croce	8-tr	8-track tape
Cassette tape			
I Remember Yesterday	Donna Summer	Cass	Cassette tape
Compact disc			
King of Swing!	Count Basie and His Orchestra	CD	Compact disc
Rachmaninov Piano Concerto 1 & 3	Count Basie and His Orchestra	CD	Compact disc

5.6 Setting Properties on a Report

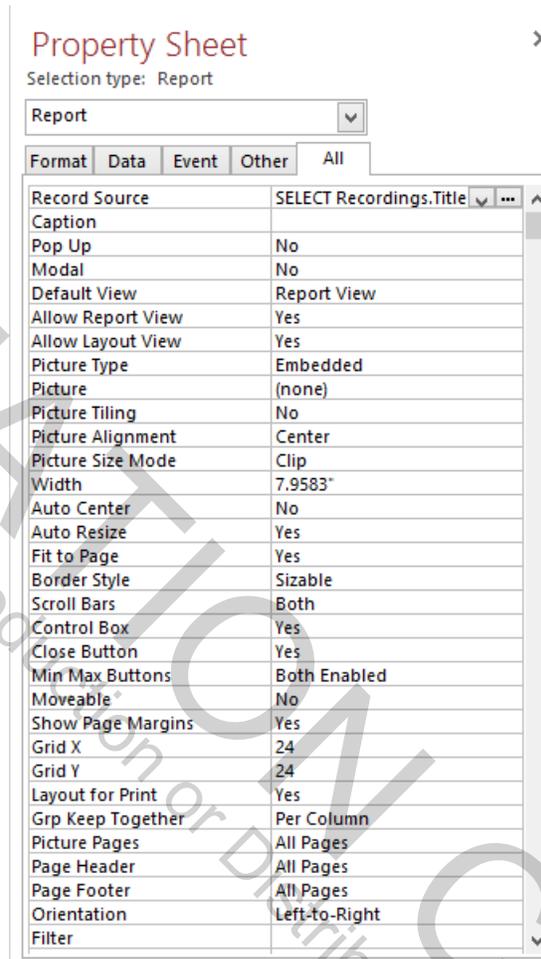
As with forms, we've hardly made a dent in the number of items that can be managed on a report. To see all the available properties, we can refer to the property sheets for the report, the report sections, and the individual objects on the report.

The property sheets for reports are laid out the same as those for forms.

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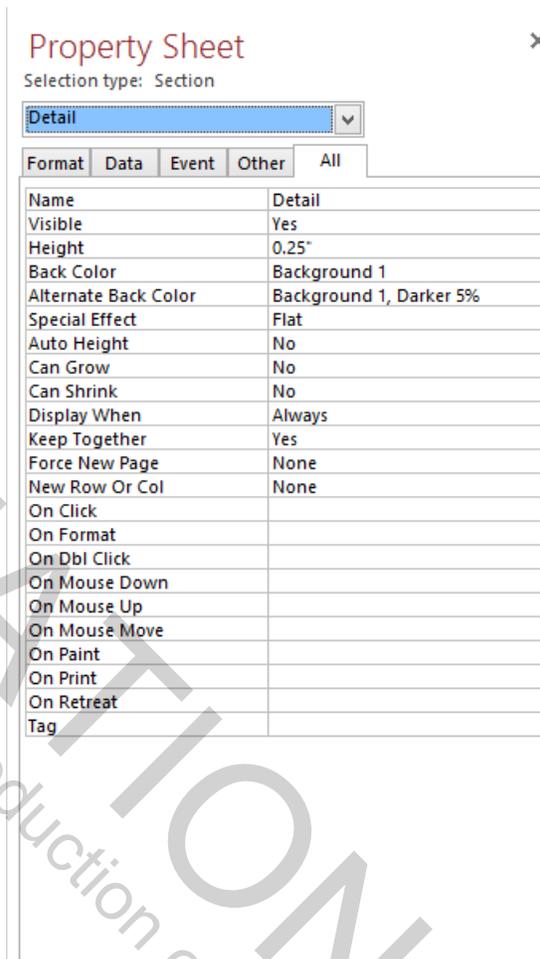
Report Property Sheet

To view the property sheet for the report, right-click anywhere in the report design surface and select **Report Properties** from the shortcut menu.



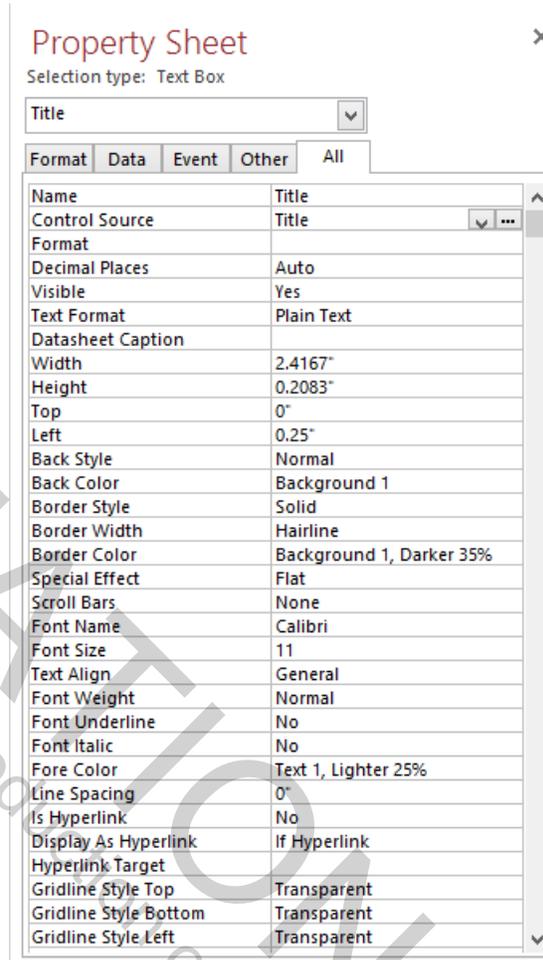
Section Property Sheet

To view the property sheet for a particular section of a report, right-click in that section and select **Properties** from the shortcut menu.



Object Property Sheet

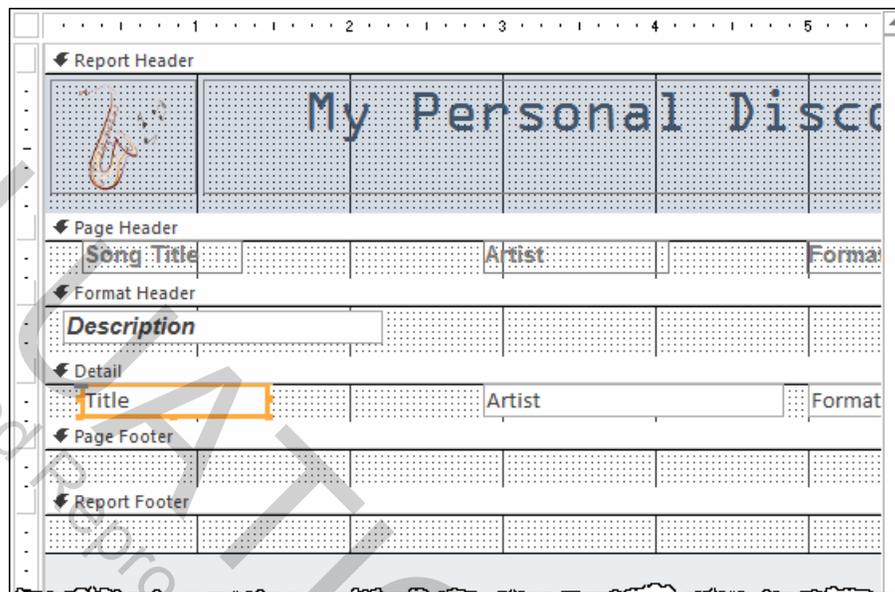
To view the property sheet for any object on the report, right-click the object and select **Properties** from the shortcut menu.



One property that you may find useful on reports is the **Can Grow** property. When applied to a text object that represents a field with values of variable length, Can

Grow expands the vertical space that a value displays in if it would otherwise be cut off.

To demonstrate the Can Grow property, we'll temporarily shorten the Title field object.



To apply the Can Grow property:

1. In Design view, select the field object you want to apply the **Can Grow** property to.
2. If it's not currently showing, open the property sheet for the field object.
3. Select the **Format** tab.

Reports

4. If necessary, scroll down to find the **Can Grow** field and select "Yes" from the drop-down list.
5. Preview the report.

My Personal Discography

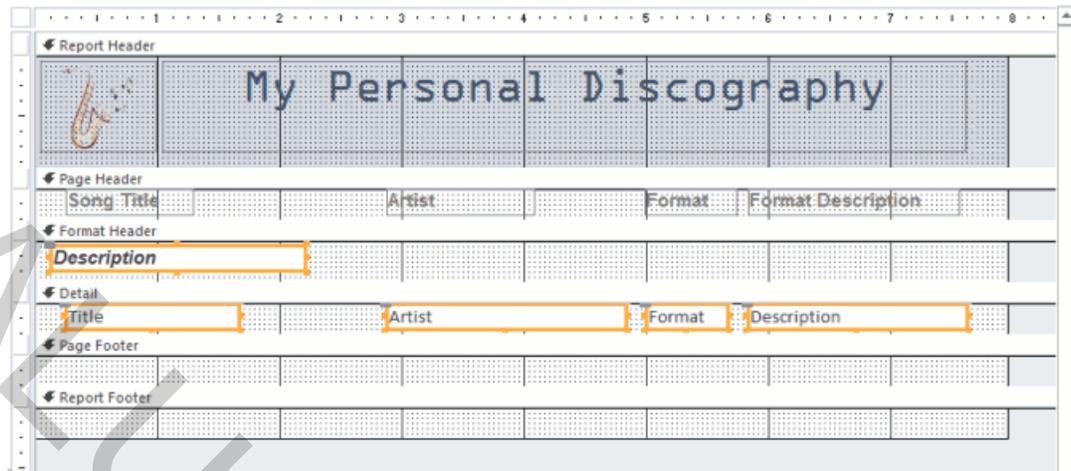
Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
8-track tape			
I Got a Name	Jim Croce	8-tr	8-track tape
Cassette tape			
I Remember Yesterday	Donna Summer	Cass	Cassette tape
Compact disc			
King of Swing!	Count Basie and His Orchestra	CD	Compact disc
Rachmaninov Piano	Count Basie and His Orchestra	CD	Compact disc

A helpful characteristic of property sheets is the ability to select multiple objects and then to view and change the properties that the objects have in common.

To demonstrate how to use the multiple selection property sheets, let's remove the borders around the data on the report.

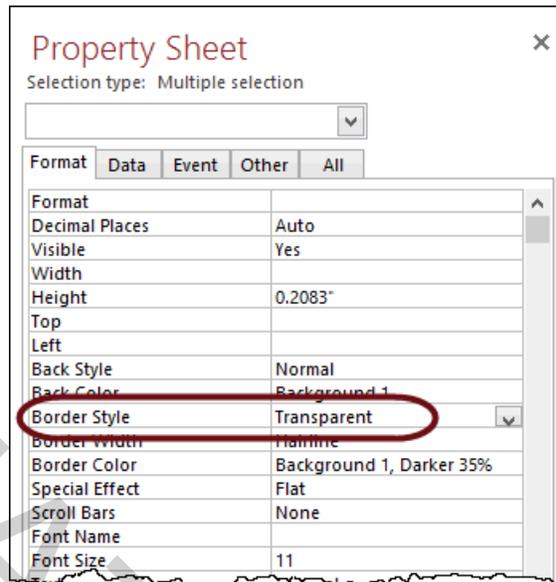
To do so:

1. In Design view, select the objects you want to remove the borders from.

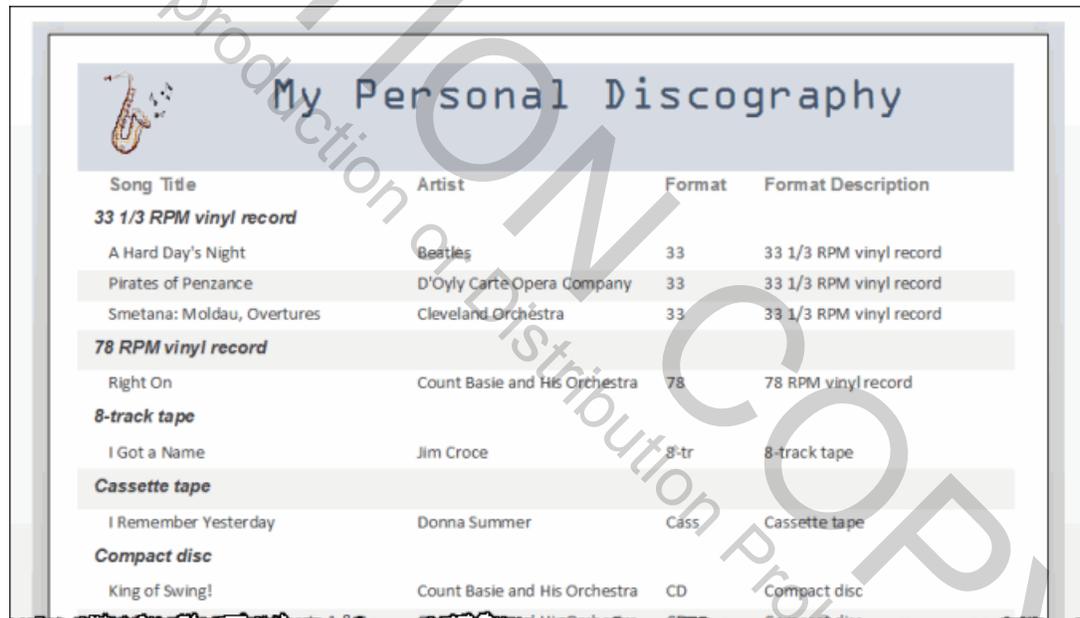


2. On the **Report Design Tools: Design** tab in the **Tools** group, click **Property Sheet**.
3. Select the **Format** tab.

- From the **Border Style** drop-down list, select "Transparent".



- Preview your report.



While we're at it, let's remove the shading too.

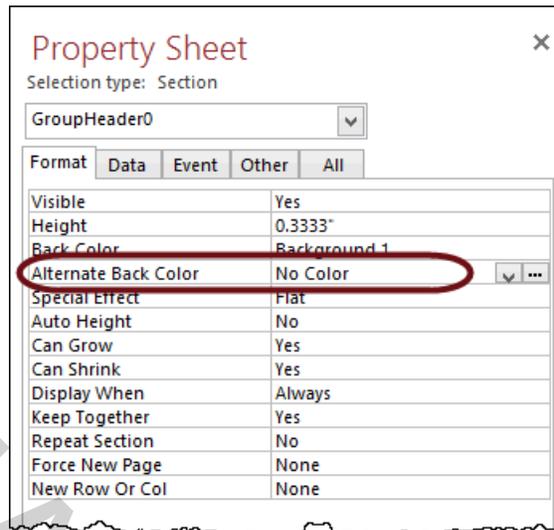
The shading in our example occurs in two places, the group header section and the detail section.

To remove the shading:

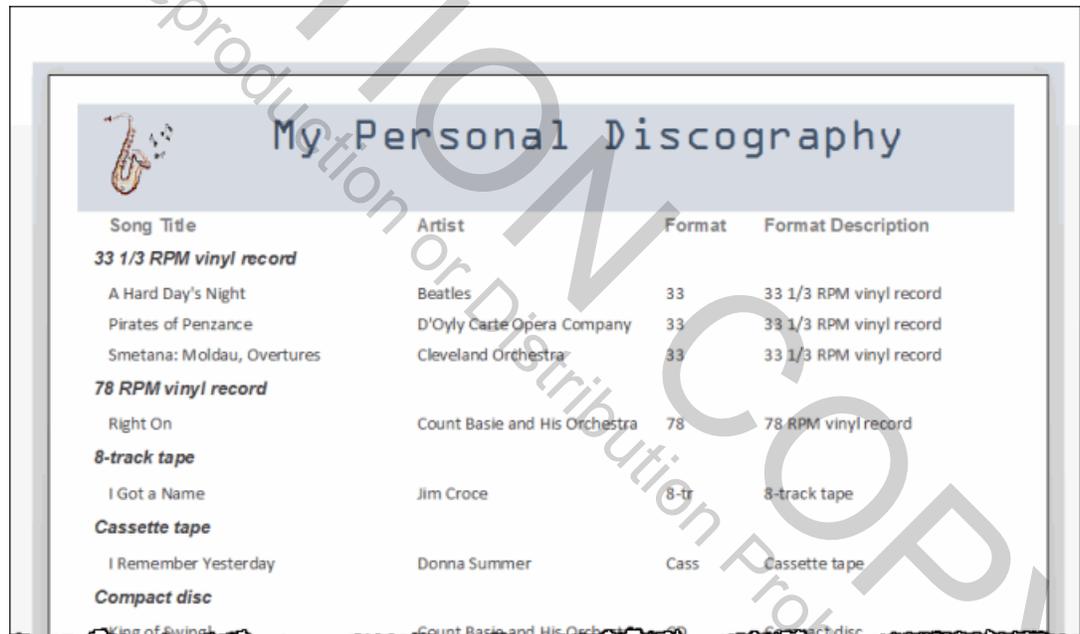
1. Select the group header and open its property sheet.
2. Select the **Format** tab.

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- From the **Alternate Back Color** drop-down list, select "No Color".



- Repeat this procedure for the Detail section.
- When you finish, preview the report.



Adding Record Counts

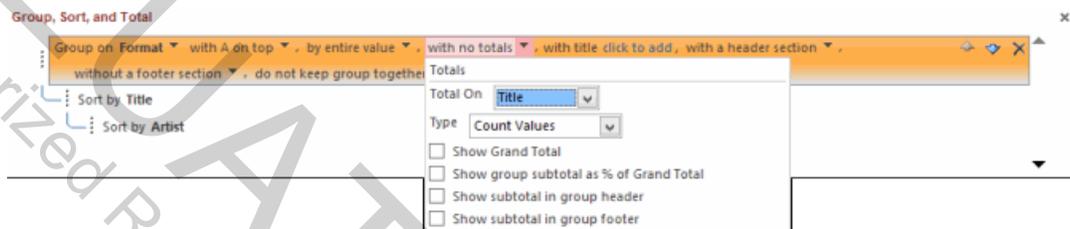
Access can show us the number of records in a group and the total number of records on our report. To accomplish this, we use the Totals feature.

To show record counts on the report:

1. In Design view, on the **Report Design Tools: Design** tab in the **Grouping & Totals** group, click **Group & Sort** to open the **Group, Sort, and Total** pane.
2. In the **Group on** line, click **More**.



3. Click the **with no totals** drop-down list.



4. From the **Type** drop-down list, select "Count Records".
5. Mark the **Show Grand Total** check box.

Reports

6. Mark the **Show subtotal in group footer** check box.

Totals

Total On

Type

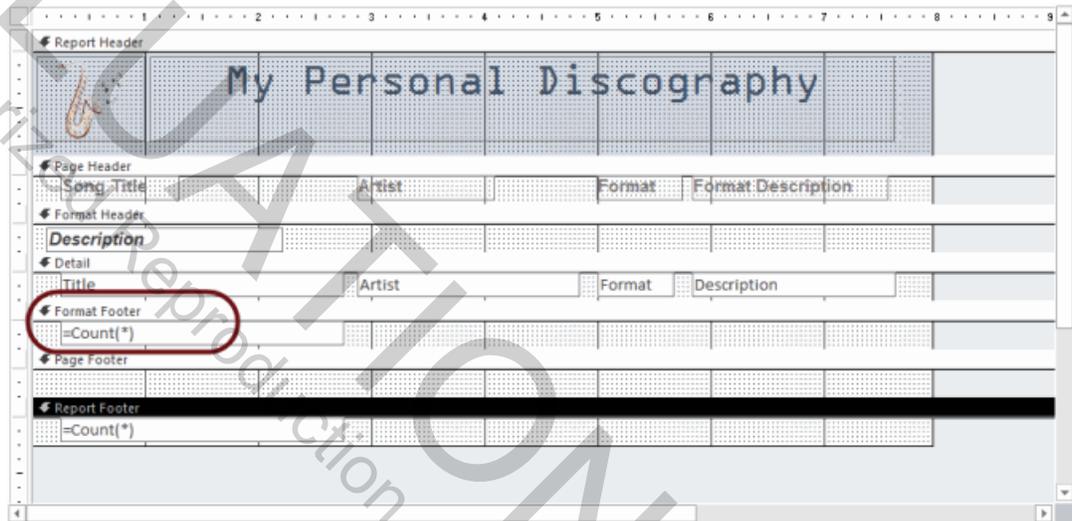
Show Grand Total

Show group subtotal as % of Grand Total

Show subtotal in group header

Show subtotal in group footer

Notice that a group footer is added to the report design and that Count fields have been added in the group footer and report footer.



7. Preview the report.

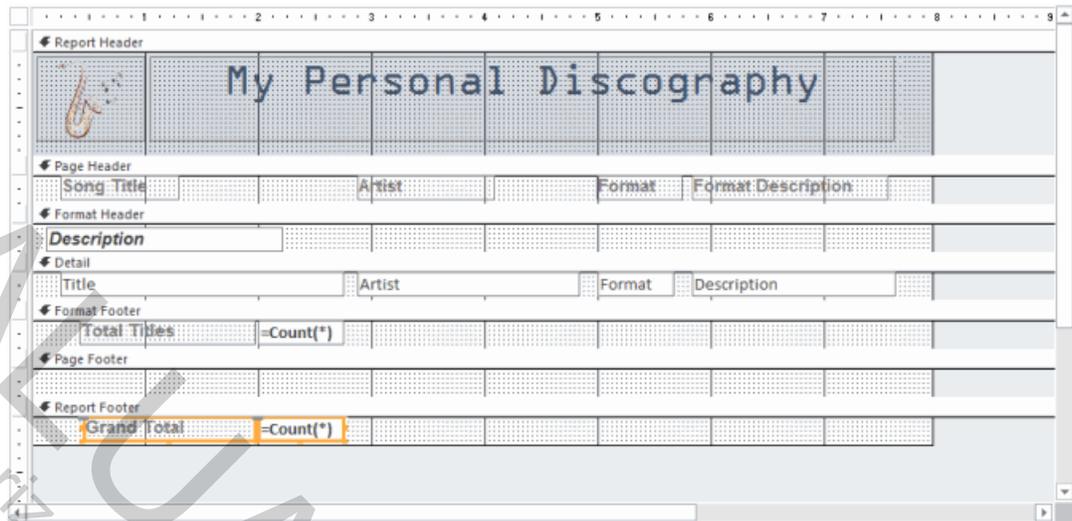
Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
	3		
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
	1		
8-track tape			
I Got a Name	Jim Croce	8-tr	8-track tape
	1		
Cassette tape			
I Remember Yesterday	Donna Summer	Cass	Cassette tape
	1		
Compact disc			
King of Swing!	Count Basie and His Orchestra	CD	Compact disc
Rachmaninov Piano Concerto 1 & 3	Count Basie and His Orchestra	CD	Compact disc
The White Album	Beatles	CD	Compact disc
	3		
MP3 file			
Just a Dream	Carrie Underwood	MP3	MP3 file
Music of the Night	Alfie Boe	MP3	MP3 file
Skyfall	Adele	MP3	MP3 file
	3		
	12		

We have totals now, but they look a little stark without labels to identify them. We'll go ahead and add labels and tweak the formatting.

To add labels to the Count fields:

1. Right-click on the Count field and select **Set Caption** from the shortcut menu.
2. Resize the label as needed.

- Change the label text to describe the totals.



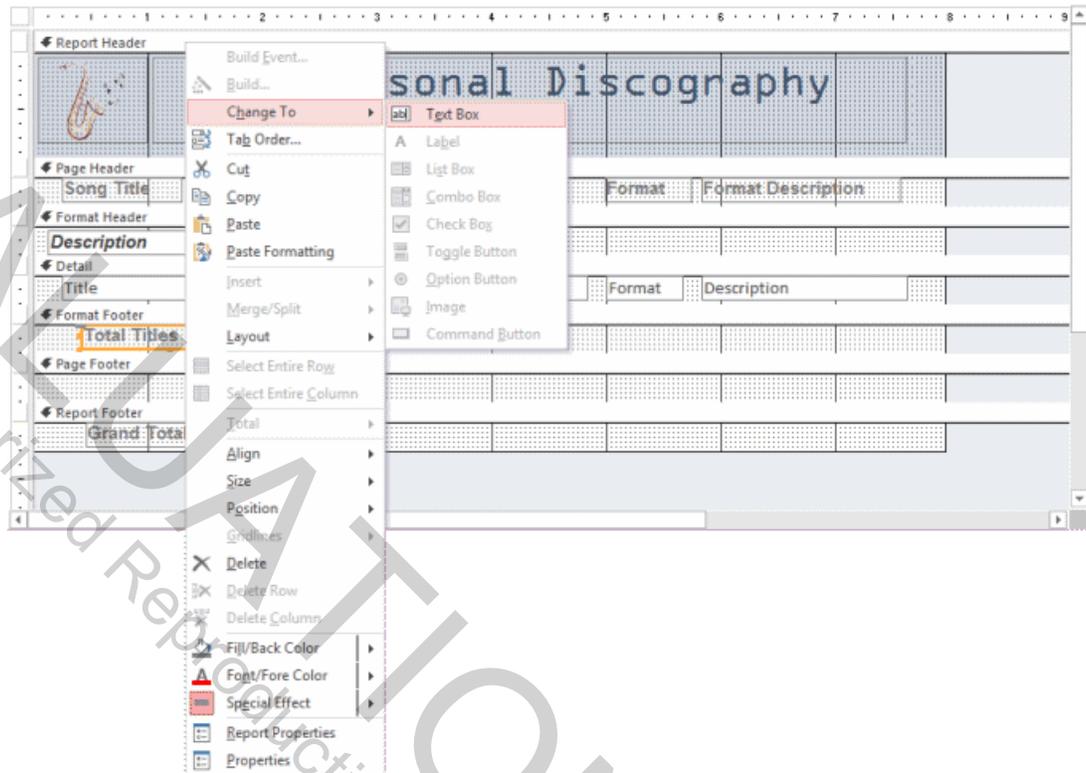
- Preview the report.

Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
Total Titles	3		
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
Total Titles	1		
8-track tape			
I Got a Name	Jim Croce	8-tr	8-track tape
Total Titles	1		
Cassette tape			
I Remember Yesterday	Donna Summer	Cass	Cassette tape
Total Titles	1		
Compact disc			

Suppose we want to customize our group total labels to indicate what is in each group. We can do that using a text box and a simple expression.

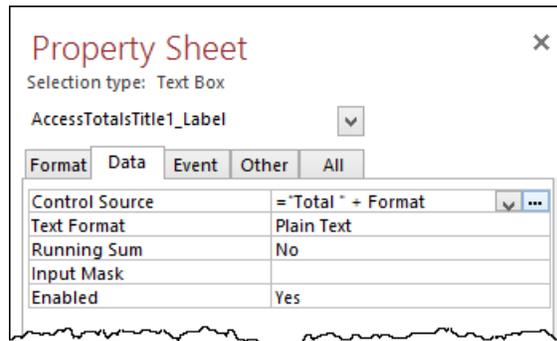
To customize the group label:

1. Select the label in the group footer, right-click, and select **Change To > Text Box** from the shortcut menu.

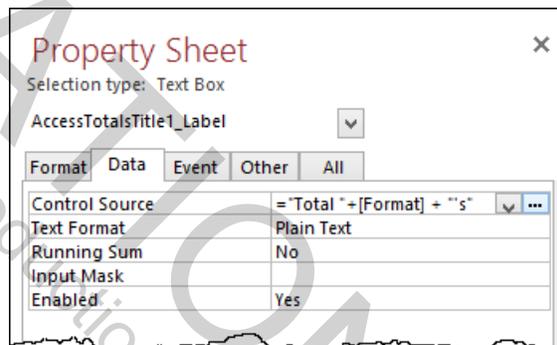


2. In the ribbon, click **Property Sheet**.
3. In the property sheet, select the **Data** tab.
4. From the **Control Source** drop-down list, select the field with the values you want to build the label around.
5. Move the cursor in front of the field name in the **Control Source** field and type "=", then in quotes type any text you want to precede the field name. If you need to include a space after, you can enclose that in the same quotes.

6. Type a "+".



7. Move the cursor after the field name, type "+" and then type any text you need to follow the field name. Put quotes around the text you type and include spaces inside the quotes as needed.



We have created a simple expression that concatenates (combines) text and a field to make a custom label.

- Preview your report.

Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
Total 33's	3		
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
Total 78's	1		
8-track tape			
I Got a Name	Jim Croce	8-tr	8-track tape
Total 8-tr's	1		
Cassette tape			
I Remember Yesterday	Donna Summer	Cass	Cassette tape
Total Cass's	1		
Compact disc			

- Notice that the new labels are enclosed in those pesky borders, so clean those up if desired and make any other tweaks you want to the formatting.

5.7 Special Report Fields

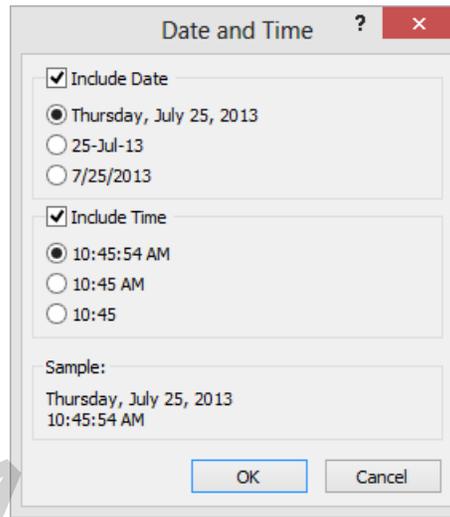
Access includes a couple of built-in report fields for standard report formatting: dates and page numbering.

Dates

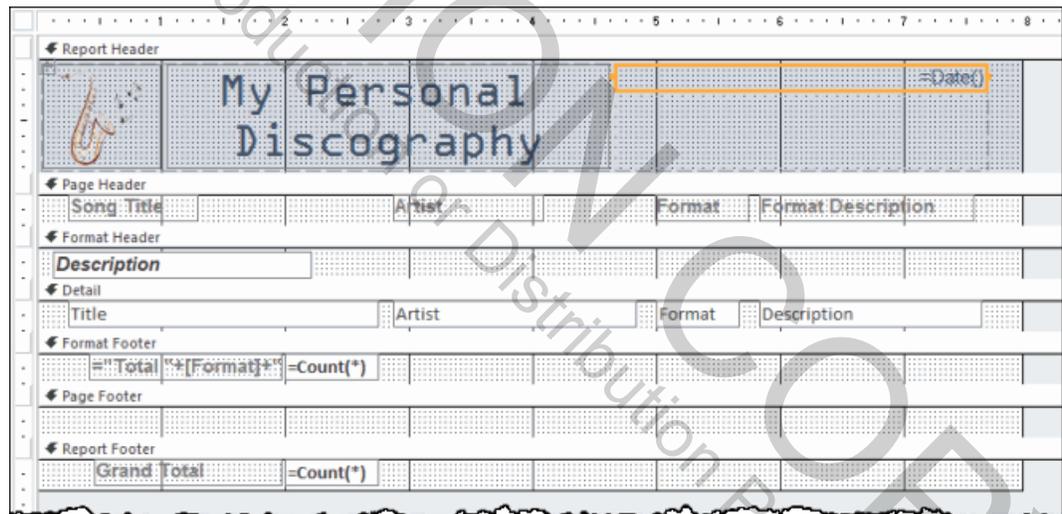
To insert a date in your report to indicate when the report was produced:

Reports

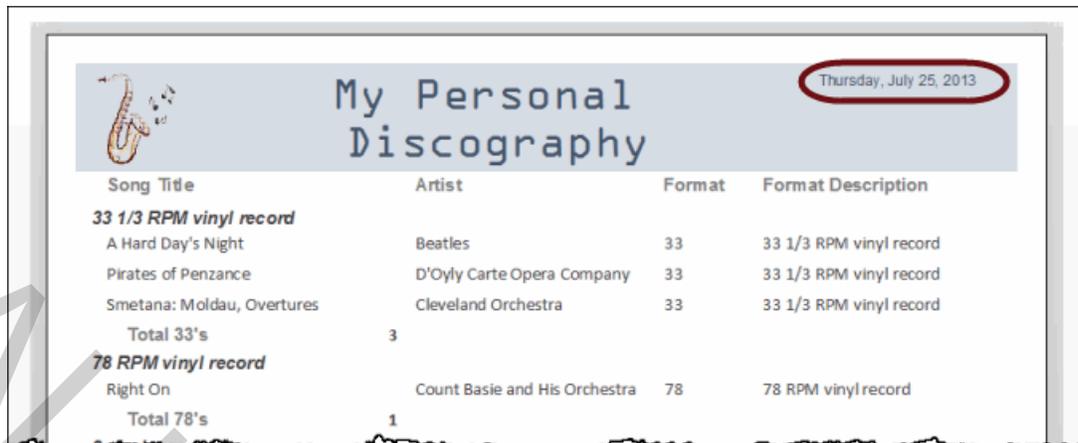
1. In Design view, on the **Report Design Tools: Design** tab in the **Header/Footer** group, click **Date and Time**. The **Date and Time** dialog box opens.



2. Select the date style you want, decide if you want to include the time and, if so, the style you want, and click **OK**. The date field is inserted in the header of your report.



3. Move, resize, and format the date field and other fields as desired.
4. Preview your report.



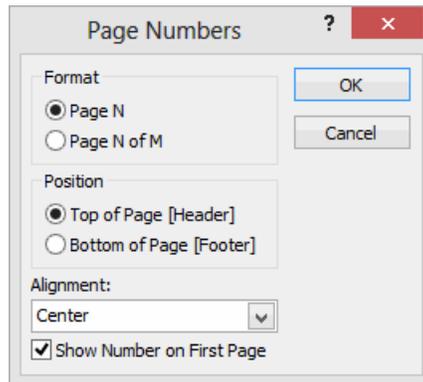
Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
Total 33's	3		
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
Total 78's	1		

Page Numbering

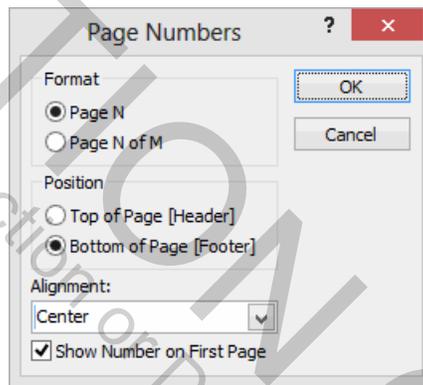
To insert page numbers in the page header or footer of your report:

Reports

1. In Design view, on the **Report Design Tools: Design** tab in the **Header/Footer** group, click **Page Numbers**. The **Page Numbers** dialog box opens.



2. Select the format, position, and alignment of page numbers for your report. If you don't want to see the page number on the first page of the report, clear the **Show Number on First Page** check box.



3. Click **OK**. The page number is inserted into the page at the position you selected.

Report Header			
My Personal Discography			=Date()
Page Header			
Song Title	Artist	Format	Format Description
Format Header			
Description			
Detail			
Title	Artist	Format	Description
Format Footer			
=Total	=Format	=Count(*)	
Page Footer			
			=Page() & {Page}
Report Footer			
Grand Total		=Count(*)	

4. Preview the report.

Rachmaninov Piano Concerto 1 & 3	Count Basie and His Orchestra	CD	Compact disc
The White Album	Beatles	CD	Compact disc
Total CD's		3	
MP3 file			
Just a Dream	Carrie Underwood	MP3	MP3 file
Music of the Night	Alfie Boe	MP3	MP3 file
Skyfall	Adele	MP3	MP3 file
Total MP3's		3	
Grand Total		12	

Page 1

5. Move, resize, and format the page number as desired.

5.8 Controls

The controls available on a report are the same as those available for forms minus the Web Browser Control and the Navigation Control.

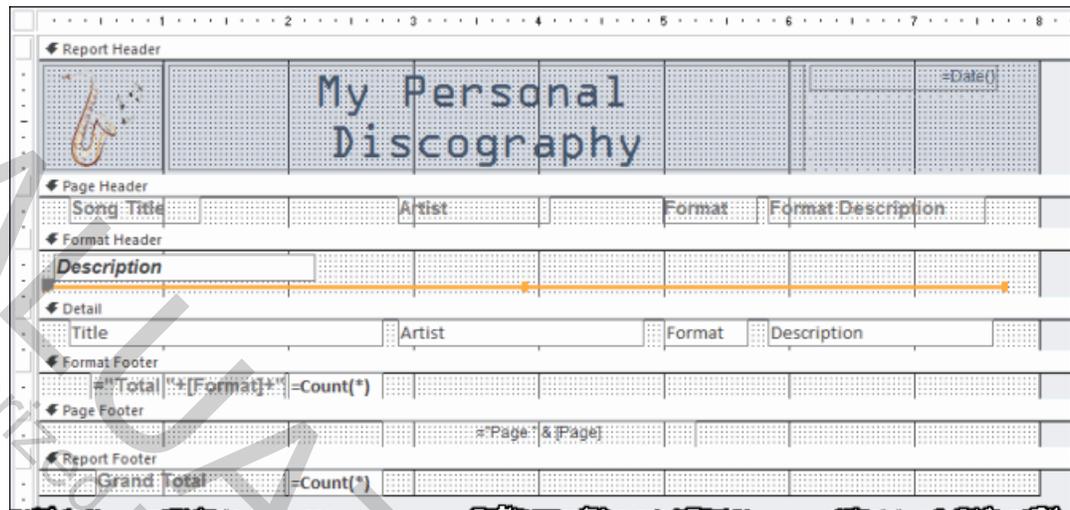
We'll demonstrate using a couple of these controls in our report. First, we'll add a line to improve the layout of our report, then we'll insert a page break.

Let's add a line below the group header to set off each of the groups in the report.

To add a line:

1. In Design view, enlarge the group header section a bit.
2. On the **Report Design Tools: Design** tab in the **Controls** group, open the drop-down list and click . The cursor changes to .

- Click and drag a line below the group label from near the left edge of the report to near the right edge. You can press **Shift** while you're drawing the line to ensure that it is straight.



- Preview the report.

My Personal Discography			
Song Title	Artist	Format	Format Description
33 1/3 RPM vinyl record			
A Hard Day's Night	Beatles	33	33 1/3 RPM vinyl record
Pirates of Penzance	D'Oyly Carte Opera Company	33	33 1/3 RPM vinyl record
Smetana: Moldau, Overtures	Cleveland Orchestra	33	33 1/3 RPM vinyl record
Total 33's	3		
78 RPM vinyl record			
Right On	Count Basie and His Orchestra	78	78 RPM vinyl record
Total 78's	1		
8-track tape			
I Got a Name	Jim Croce	8-tr	8-track tape
Total 8-tr's	1		
Cassette tape			
I Remember Yesterday	Donna Summer	Cass	Cassette tape
Total Cass's	1		
Compact disc			

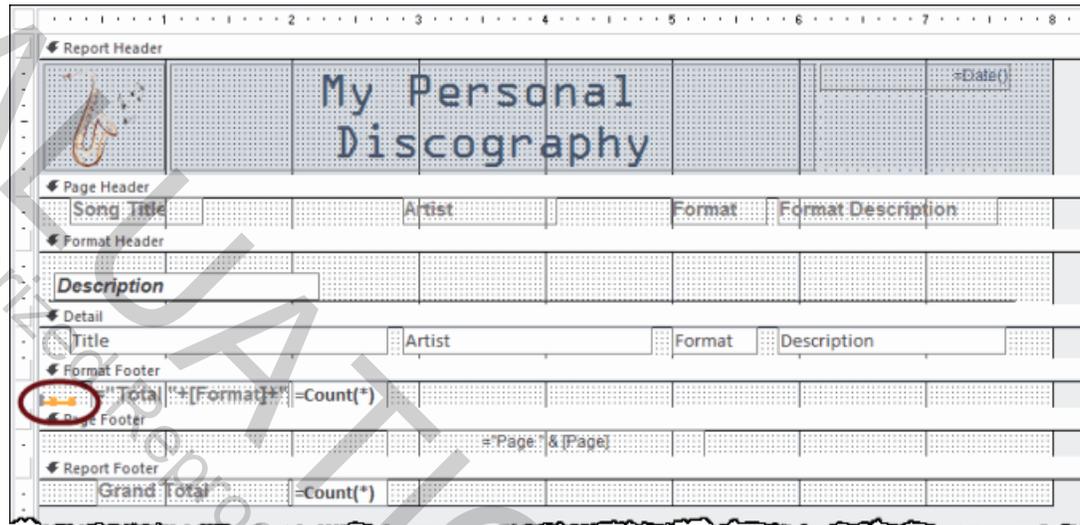
- Tweak the size of the group header and the position of the group header label to achieve the desired effect.

Suppose we want the report to start a new page each time a new group section starts. To do that, we can insert a page break in the group footer.

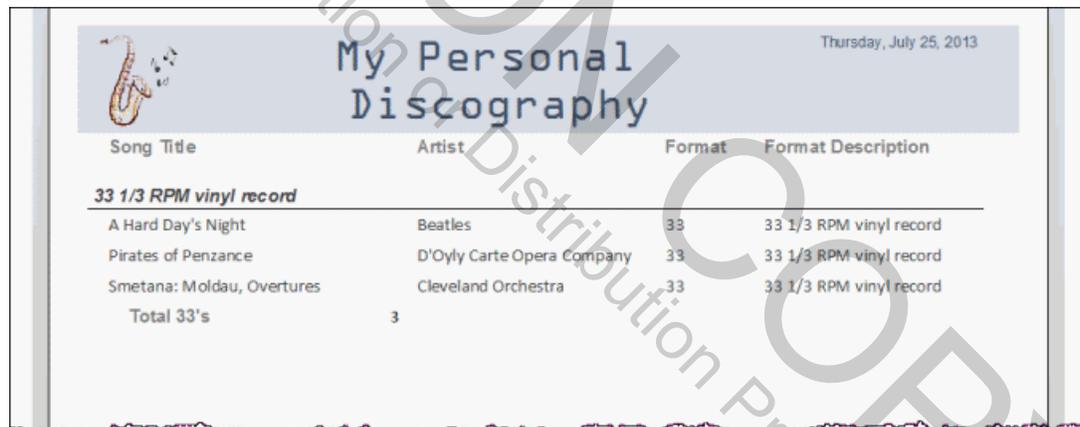
Reports

To insert a page break:

1. In Design view, on the **Report Design Tools: Design** tab in the **Controls** group, click . The icon changes to .
2. Click in the group footer below the Count field. A page break marker is added on the left.



3. Preview the report.



Due to the short length of our report, we'll remove the page breaks for now. To do so, return to Design view, highlight the page break marker, and press **Delete**.

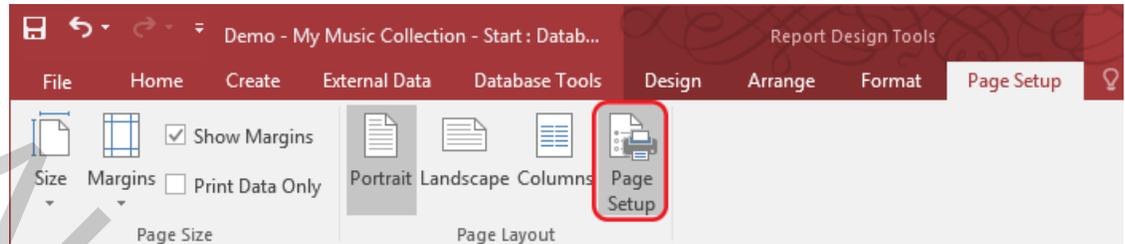
Printing a Report

After we've got our report with the information we want on it, in the format we want, we can print it. To prepare for printing, we need to ensure that the printable page is set up to our satisfaction.

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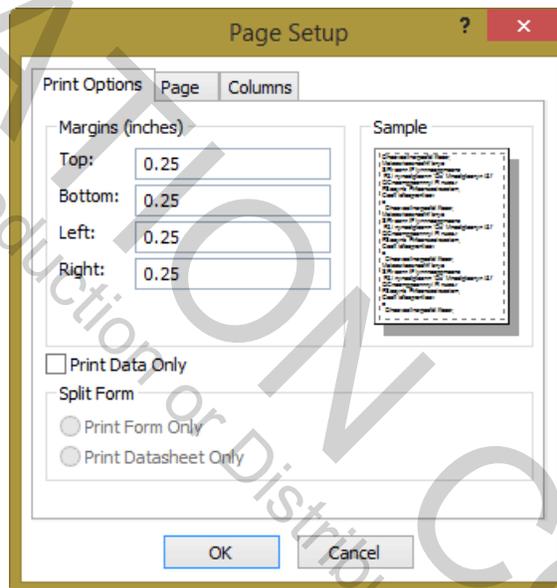
Setting Page Layout

To access page setup options, go to the **Report Design Tools: Page Setup** tab.

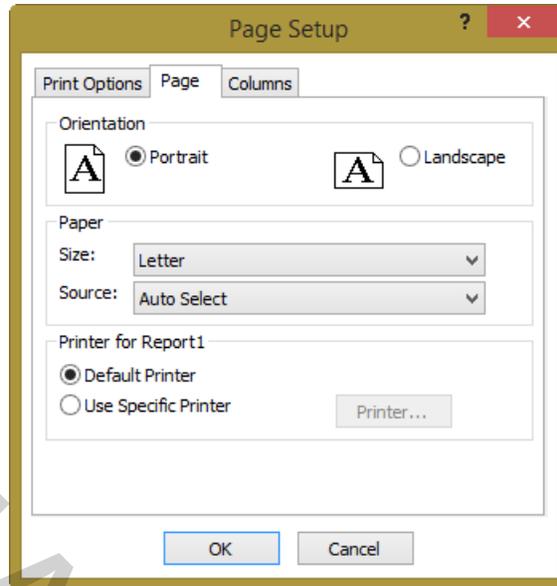


The ribbon presents most of the page setup options individually, but if we click **Page Setup**, we'll find all the options collected in one place.

Margins may be altered to suite your needs.

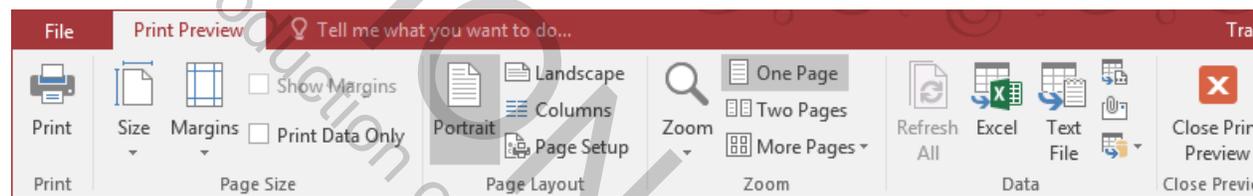


You can also choose Page Orientation and general paper size. These settings remain with the report.



Since these settings should be familiar to you, we'll not discuss them at length here.

After you have the page set up as desired, preview the report in Print Preview mode, then on the **Print Preview** tab, click **Print**.

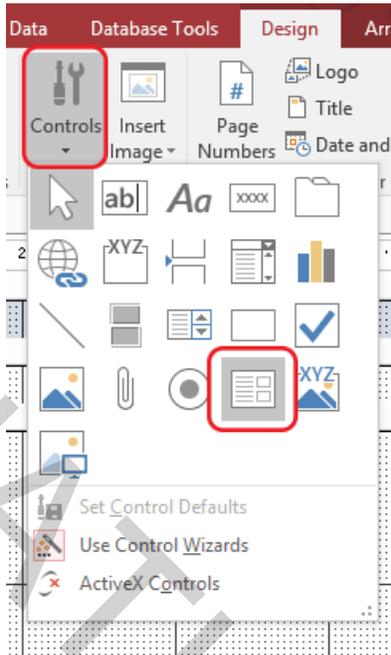


Notice on the **Print Preview** tab that you can also output your report to a variety of other formats including .xls, .txt, .pdf, .xps, .rtf, .html, and e-mail.

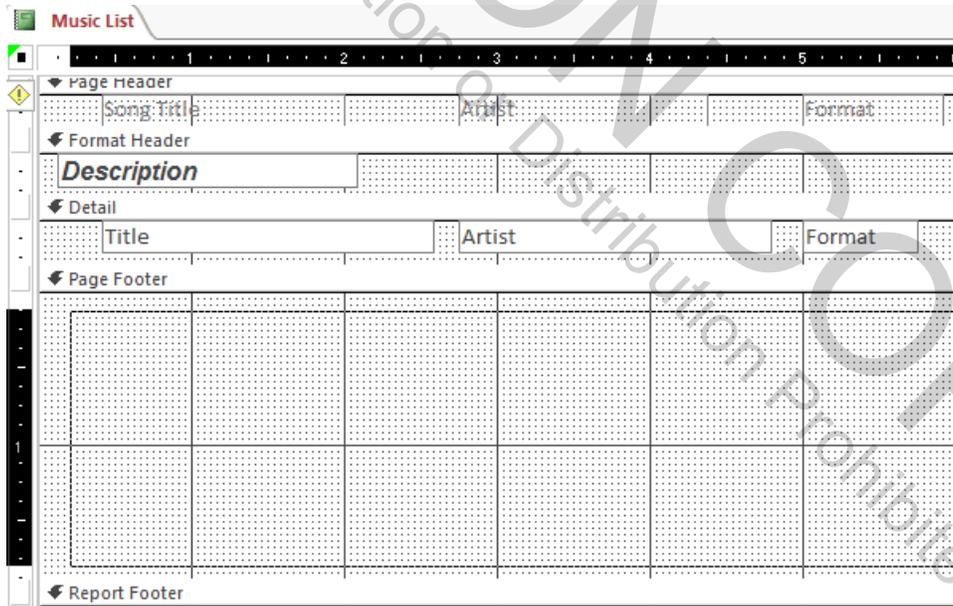
5.9 Subreports

Many times it would be helpful to show a table of data that is either related to or not related to the main report. Files are located Reports Advanced/Demos/Demo -

My Music Collection - Grouping and Sorting.accdb. We may use a subreport to achieve this. **Design > Controls > Controls > Subform/Subreport**.



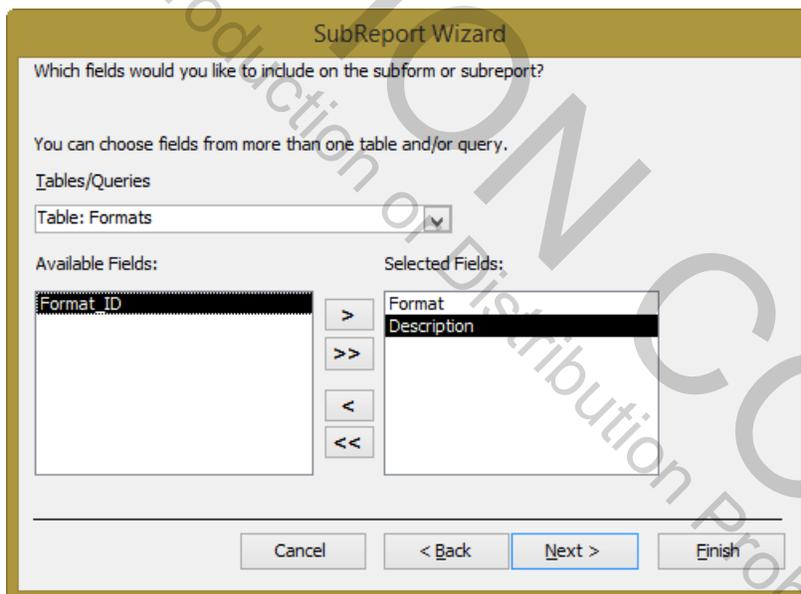
Draw the report object in the proper section. For example, if we want the subreport at the bottom of each page, use the **Page Footer** area.



A wizard should present itself, assuming they are activated, to lead you through the remaining choices. Choose to use an existing object. Click **Next**.

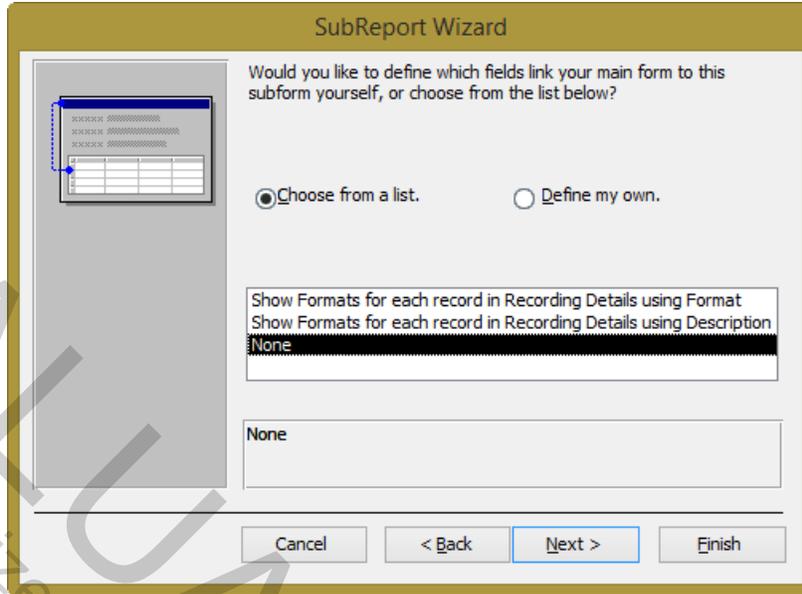


Choose the fields from the source you wish to show. Keep in mind if it will be related, you should be aware of your table relationships such as the Primary and Foreign keys which connect the data. Click **Next**.



Choose a connection, if you want to show all of the data, then choose **None**. Click **OK**.

Reports



SubReport Wizard

Would you like to define which fields link your main form to this subform yourself, or choose from the list below?

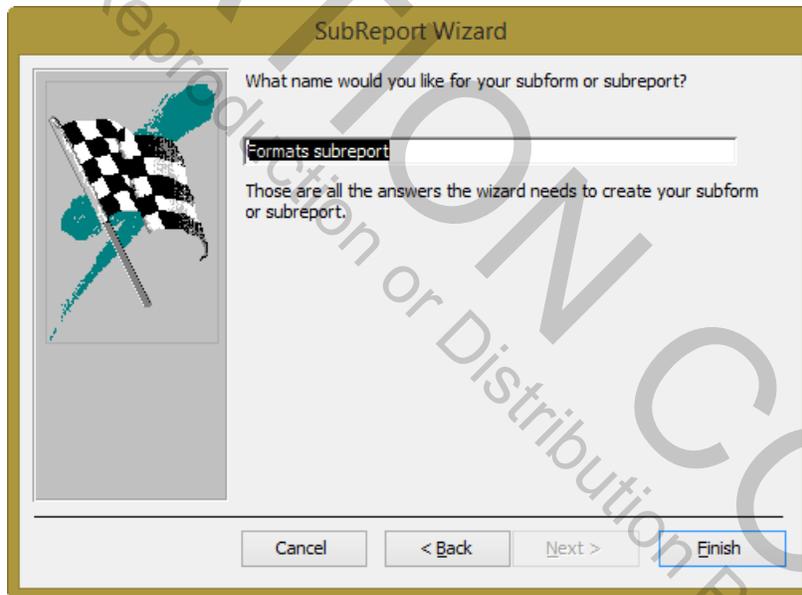
Choose from a list. Define my own.

Show Formats for each record in Recording Details using Format
Show Formats for each record in Recording Details using Description
None

None

Cancel < Back Next > Finish

Name your subreport. Click **OK**.



SubReport Wizard

What name would you like for your subform or subreport?

Formats subreport

Those are all the answers the wizard needs to create your subform or subreport.

Cancel < Back Next > Finish

Your report may look like this.

Music List		
King of Swing!	Count Basie and His Orchestra	CD
Rachmaninov Piano Concerto 1 & 3	Cleveland Orchestra	CD
The White Album	Beatles	CD
MP3 file		
Just a Dream	Carrie Underwood	MP3
Music of the Night	Alfie Boe	MP3
Skyfall	Adele	MP3

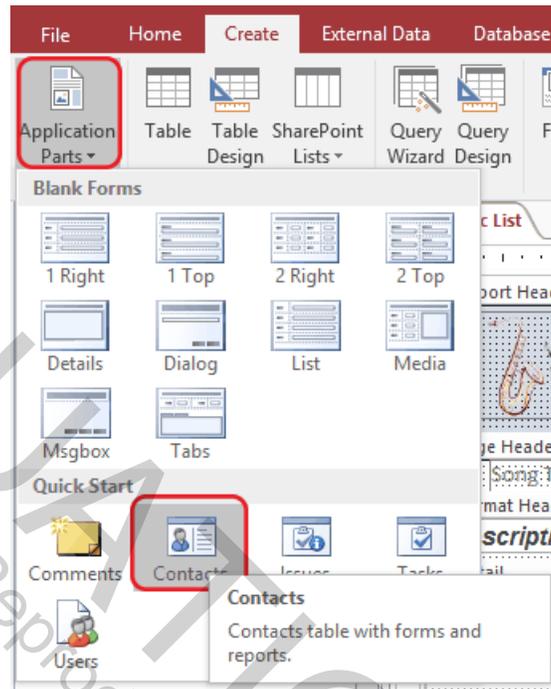
Format	
ACE	Acetate disc
78	78 RPM vinyl record
45	45 RPM vinyl record
33	33 1/3 RPM vinyl record
Cass	Cassette tape
8-tr	8-track tape

5.10 Application Parts

Creation of reports may be started by using any existing reports in the Application Parts. Many of the reports are bundled with other objects such as tables to store the

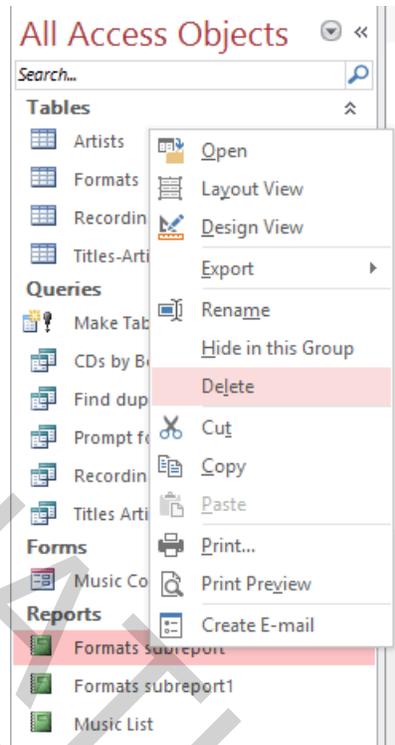
Reports

data, and forms to enter the data. These may be customized and changed as needed once they are created.



5.11 Deleting a Report

When a report is no longer needed, you may delete it by right mouse clicking on a report name and choosing **Delete**.



5.12 Formatting a Report

Using the Ribbon, or the Property Sheet, most aspects of the report can be altered.

Reports

The screenshot shows the Microsoft Access Report Design View for a report named 'RPT_TBIClient'. The report is divided into several sections: Report Header, Page Header, rName Header, Unbound, orderDate Header, Detail, Page Footer, and Report Footer. The Detail section contains a table with columns for 'itemName', 'numb', and 'Price'. The Property Sheet is open on the right, showing the 'Format' tab for a 'Text Box' control. The Property Sheet lists various properties such as 'Decimal Places', 'Visible', 'Width', 'Height', 'Top', 'Left', 'Back Style', 'Back Color', 'Border Style', 'Border Width', 'Border Color', 'Special Effect', 'Scroll Bars', 'Font Name', 'Font Size', 'Text Align', 'Font Weight', 'Font Underline', 'Font Italic', 'Fore Color', 'Line Spacing', 'Is Hyperlink', 'Display As Hyperlink', 'Hyperlink Target', 'Gridline Style Top', 'Gridline Style Bottom', 'Gridline Style Left', 'Gridline Style Right', and 'Gridline Width Top'.

Adding a Background and Images and Applying a Theme

Themes allow an efficient way to develop a consistent color through out the report.

The screenshot shows the Microsoft Access Report Design Tools ribbon. The ribbon is divided into several tabs: File, Home, Create, External Data, Database Tools, Design, Arrange, Format, Page Setup, Tell me..., and Tracy Berry. The Design tab is currently selected, and the 'Property Sheet' button is highlighted with a red box. The ribbon also includes various tool icons for View, Themes, Group & Sort, Totals, Hide Details, Controls, Insert Image, Page Numbers, Logo, Title, Date and Time, Add Existing Fields, and Tab Order.

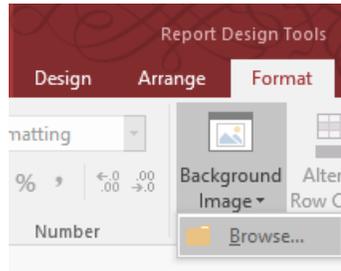
1. Click on **Design > Themes > Colors**.
2. Choose a theme that you wish to use. Click on it to apply.



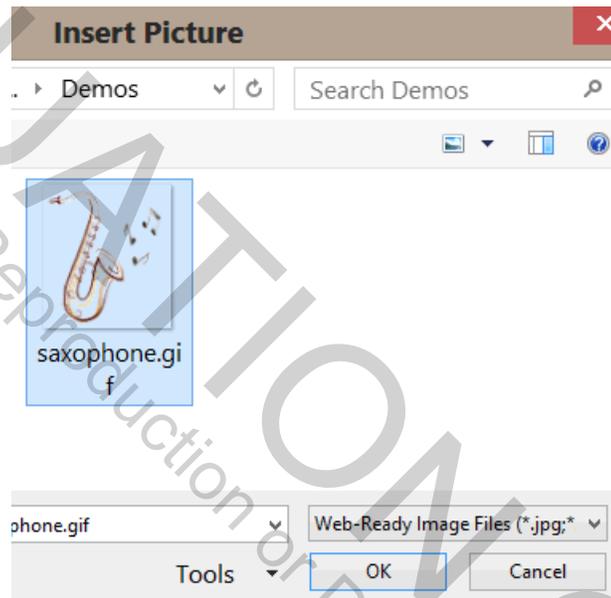
Images create an easy way to brand a set of reports to a corporate identity.

Reports

1. Click on **Format > Background > Background Image > Browse**.



2. Choose the proper picture. Click **OK**.



3. The picture is now placed behind the report objects as a background.

Exercise 7 Creating Reports

25 to 45 minutes

In this exercise, you will create a report of transactions from the Bank Register database. Use the database found in the ClassFiles/Reports_Advanced/Exercises folder as a starting point.

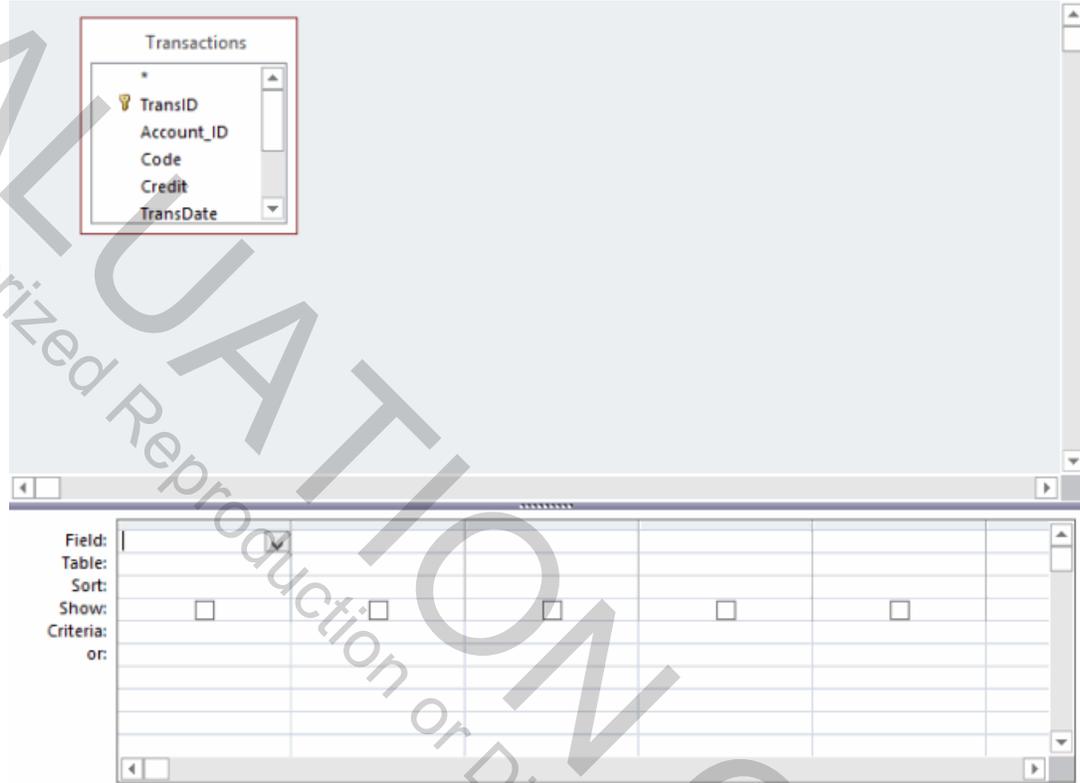
1. Create a query based on the Transactions table that shows uncleared checking account transactions. Name the query "Uncleared Checking Transactions".
2. Create a tabular report based on the Uncleared Checking Transactions query. The report should have the following characteristics:
 - A. Add the following title to the report: "Uncleared Bank Transactions". Add a date field in the report header.
 - B. Show the following fields: TransDate, Code, Description, and Amount.
 - C. Group the records on the report by credits and debits and sort them first by date, then by description.
 - D. Label the credits group "Credits" and the debits group "Debits". (This will require you to build an expression. Hint: Research the "Iif" function.) Put a line under the group labels.
 - E. Show a subtotal for each group. Label the subtotals "Total Credits" and "Total Debits".
 - F. Show a report total. Label the total "Grand Total". Add a line above the label.
 - G. Add page numbers at the bottom right.
 - H. Tweak the formatting as you like.

Reports

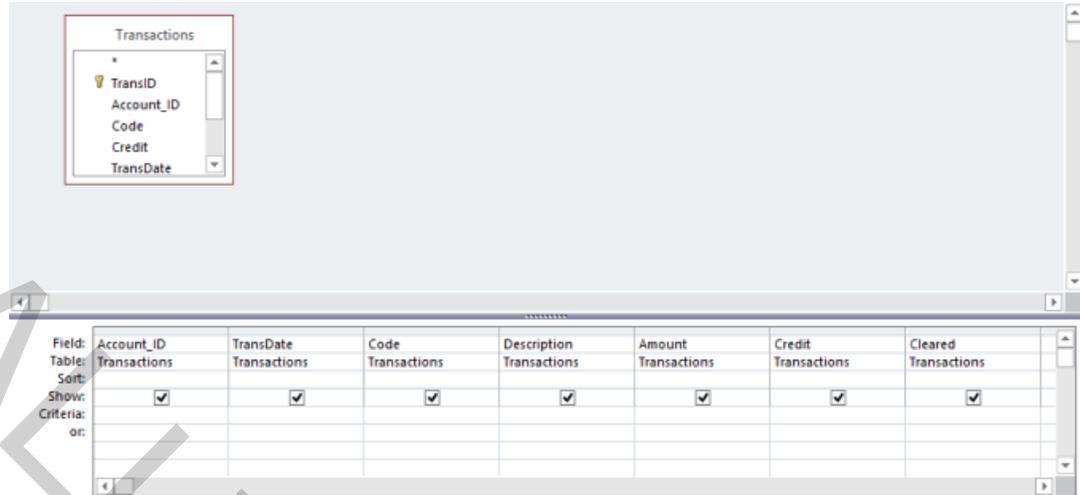
Exercise Solution

To create the query:

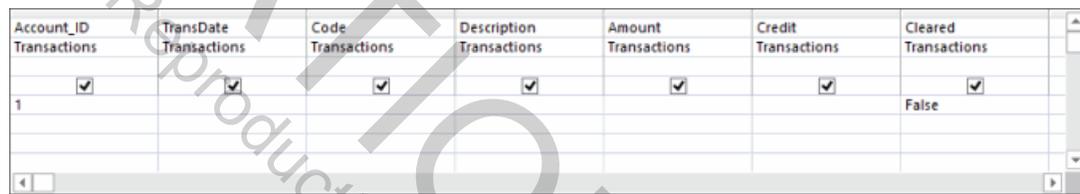
1. On the **Create** tab in the **Queries** group, click **Query Design**.
2. In the **Show Table** dialog box, select "Transactions" and click **Add**.
3. Click **Close**.



4. In the Transactions table, double-click to add the Account_ID, TransDate, Code, Description, Amount, Credit, and Cleared fields to the query design grid.



5. In the Account_ID column in the **Criteria** row, type "1". (The checking account's record ID is "1".)
6. In the Cleared column in the **Criteria** row, type "False".



7. Run the query.

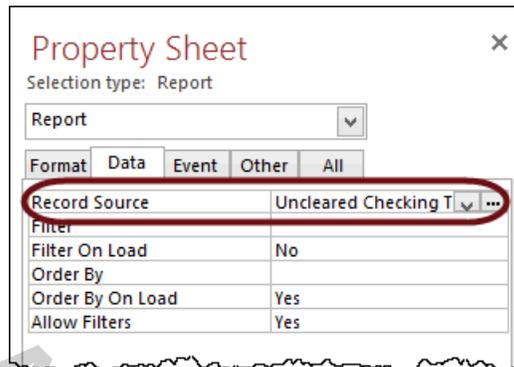
Account ID	Date	Code	Description	Amount	Credit	Cleared
1	4/7/2013	7214	Charlottesville MUD	\$74.19	<input type="checkbox"/>	<input type="checkbox"/>
1	4/14/2013	AD	US Dept of Treasury	\$372.96	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	4/16/2013	AD	Payroll deposit	\$1,095.62	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	4/16/2013	DC	Main Street Market	\$134.51	<input type="checkbox"/>	<input type="checkbox"/>
1	4/18/2013	7215	SPARC Electric	\$169.47	<input type="checkbox"/>	<input type="checkbox"/>
1	4/20/2013	7216	Lolly's Place	\$24.18	<input type="checkbox"/>	<input type="checkbox"/>
1	4/23/2013	ATM	Cash withdrawal	\$120.00	<input type="checkbox"/>	<input type="checkbox"/>
1	4/23/2013	FT	Transfer to savings	\$300.00	<input type="checkbox"/>	<input type="checkbox"/>
1	4/26/2013	7217	Basket World	\$42.69	<input type="checkbox"/>	<input type="checkbox"/>
1	4/29/2013	AD	Interest	\$0.89	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*				\$0.00	<input type="checkbox"/>	<input type="checkbox"/>

8. Save the query as "Uncleared Checking Transactions".
9. Close the query.

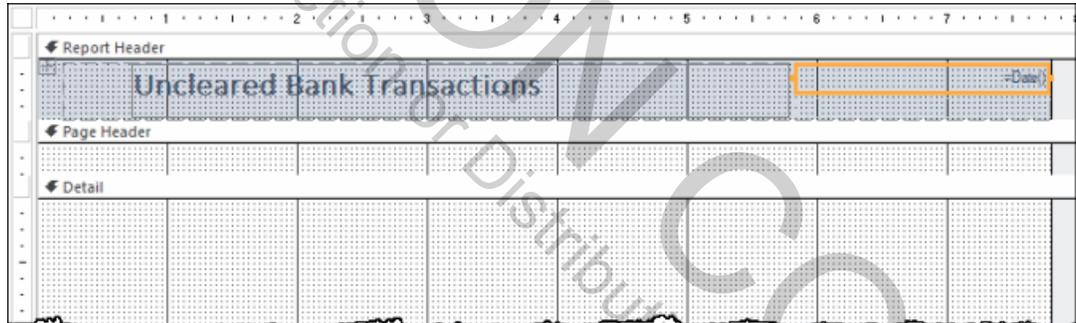
To create the report:

Reports

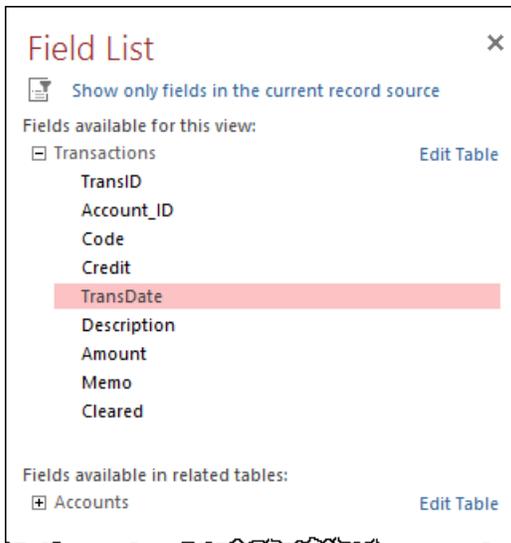
1. On the **Create** tab in the **Reports** group, click **Blank Report**.
2. Switch to Design view.
3. Right-click in the design surface and select **Report Properties**.
4. Select the **Data** tab.
5. From the **Record Source** drop-down list, select the Uncleared Checking Transactions query.



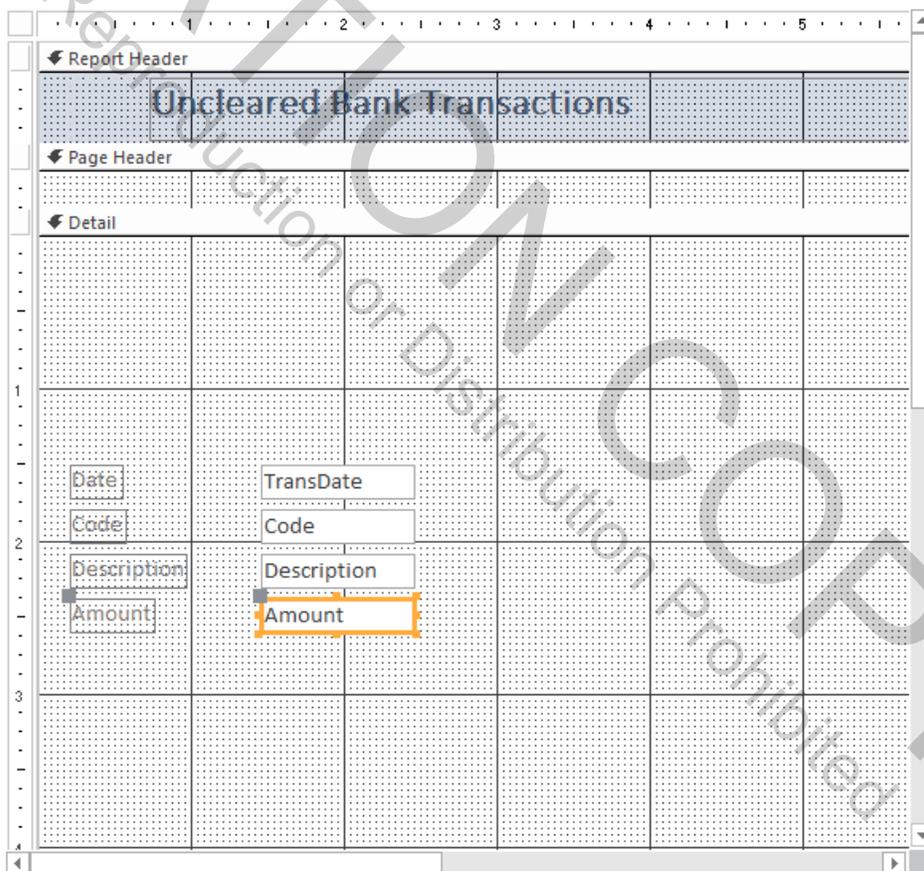
6. Close the property sheet.
7. On the **Report Design Tools: Design** tab in the **Header/Footer** group, click **Title**.
8. Type the title for the report: "Uncleared Bank Transactions".
9. In the **Header/Footer** group, click **Date and Time**.
10. In the **Date and Time** dialog box, select options for the date and time, then click **OK**.
11. Format the title and date as desired.



12. On the **Report Design Tools: Design** tab in the **Tools** group, click **Add Existing Fields**.

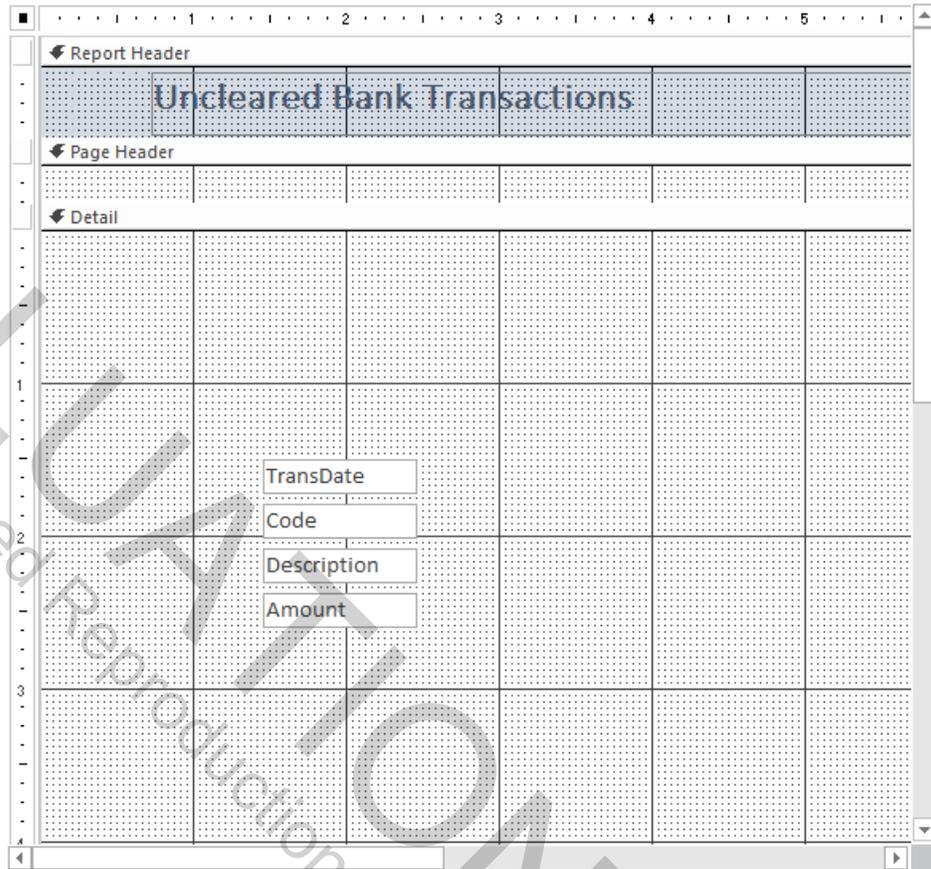


- In the **Field List** pane, in the Transactions list, double-click "TransDate", "Code", "Description", and "Amount".

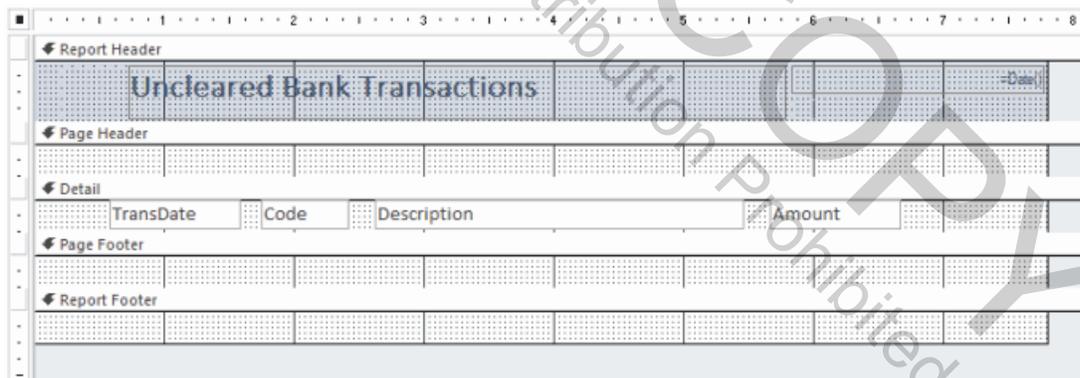


Reports

14. Select all the field labels and press **Delete**.

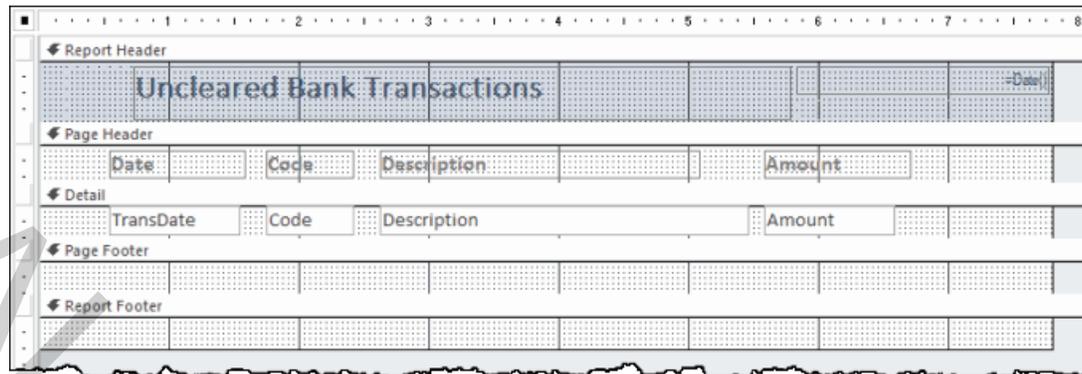


15. Arrange the fields across the top of the detail section. Resize the fields relative to the data that each contains.
16. Reduce the height of the detail section.



17. Add labels for each of the fields in the Page Header section using the label control.

18. Resize, align, and format the labels.



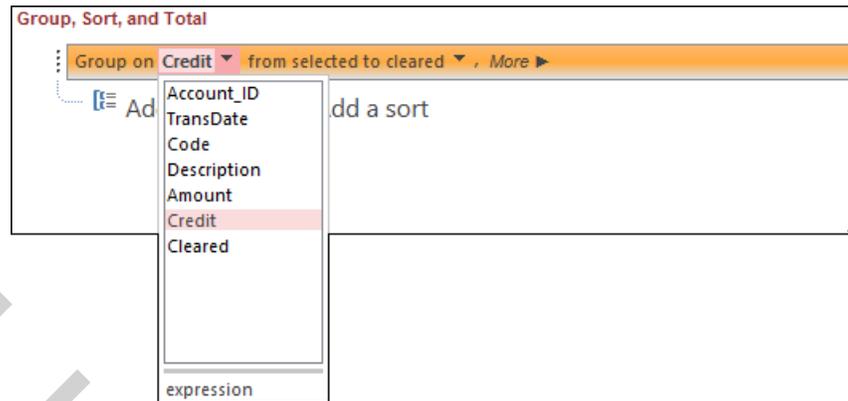
19. While we're tweaking the formatting, remove the field borders and the alternate row shading.

To do so:

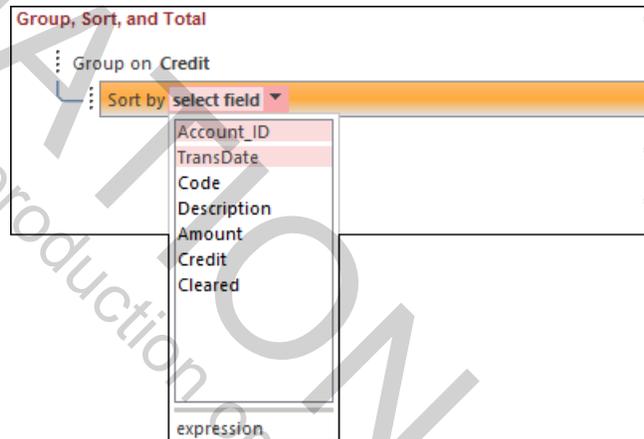
- A. Select the labels in the page header and the fields in the detail section.
 - B. Open the property sheet.
 - C. Select the **Format** tab.
 - D. From the **Border Style** drop-down list, select "Transparent".
 - E. Click in the Credit Header section.
 - F. In the property sheet, on the **Format** tab, from the **Alternate Back Color** drop-down list, select "No Color".
 - G. Click in the Detail section (but not on a field object).
 - H. From the **Alternate Back Color** drop-down list, select "No Color".
 - I. Close the property sheet.
20. On the **Report Design Tools: Design** tab in the **Grouping & Totals** group, click **Group & Sort**.
21. In the **Group, Sort, and Total** pane, click **Add a group**.

Reports

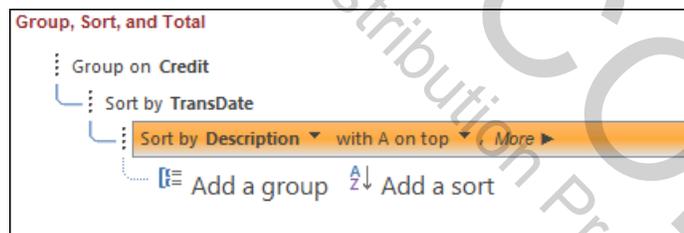
22. From the **select field** drop-down list, select "Credit".



23. Click **Add a sort** and select "TransDate" from the drop-down list.

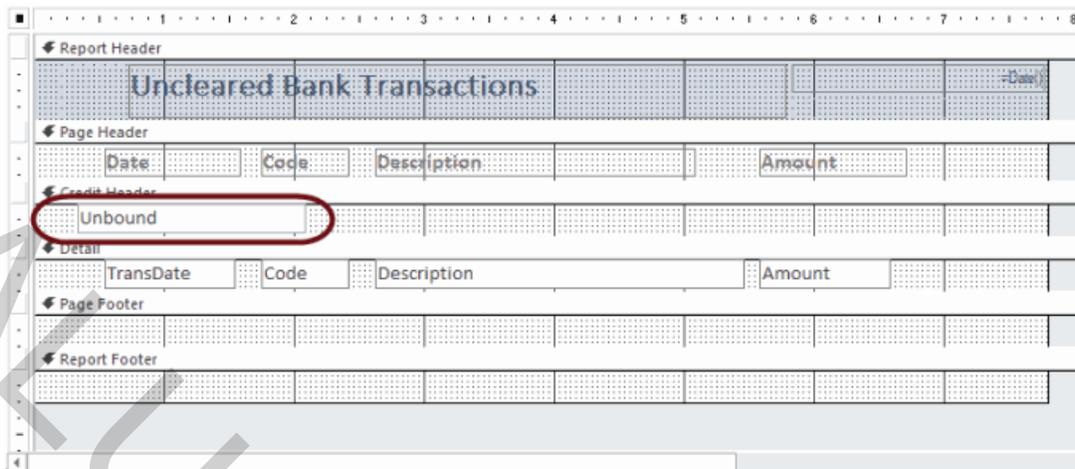


24. Click **Add a sort** again and select "Description".

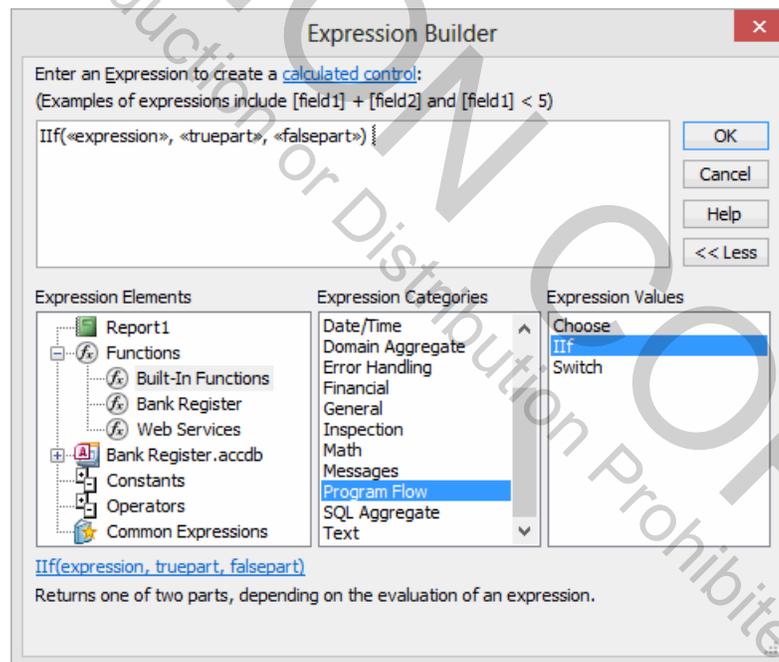


25. In the Credit Header section, add a text box to show the group header label.

26. Delete the label from the text box you just added.



27. Select the text box, open the property sheet, and select the **Data** tab.
28. On the **Control Source** field, click . The **Expression Builder** opens.
29. In the **Expression Elements** list box, expand the **Functions** list and select **Built-In Functions**.
30. In the **Expression Categories** list box, select "Program Flow".
31. In the **Expression Values** list box, double-click "IIf". The expression you've built displays in the expression window.



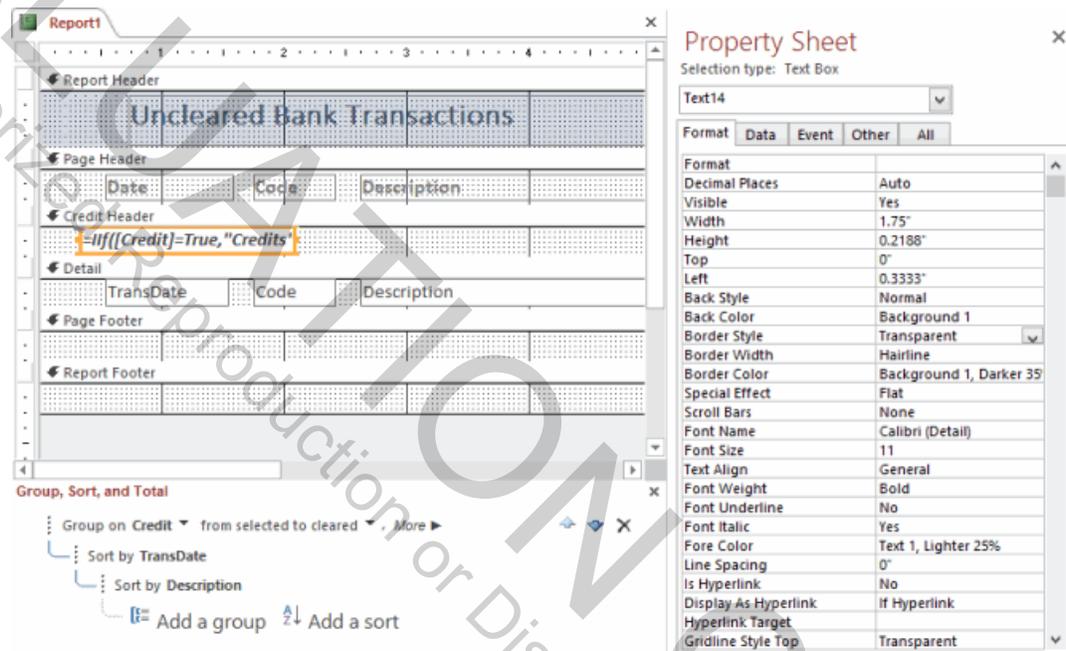
32. Replace the <<expression>> placeholder with "[Credit]=True".
33. Replace the <<>truepart>> placeholder with "Credits" (enclosed in quotes).

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34. Replace the <<falsepart>> placeholder with "Debits" (enclosed in quotes).

```
=IIf([Credit]=True,"Credits","Debits")
```

35. Click **OK**.
36. In the property sheet, remove the borders from the label by selecting "Transparent" from the **Border Style** drop-down list.
37. Format the group header label as desired.



38. Close the property sheet.
39. Enlarge the Credit Header to make room to add a line below the label.
40. On the **Report Design Tools: Design** tab in the **Controls** group, click **Text Box**.

41. Click and drag to draw a line from near the left edge of the Credit Header to near the right edge of the Credit Header.

Report Header				
Uncleared Bank Transactions				
Page Header				
Date	Code	Description	Amount	
Credit Header				
=Iff([Credit]=True,"Credits")				
Detail				
TransDate	Code	Description	Amount	
Page Footer				
Report Footer				

42. In the **Group, Sort, and Total** pane in the **Group on** row, click **More**.
43. From the **with no totals** drop-down list, select "Totals".
44. From the **Total On** drop-down list, select "Amount".
45. From the **Type** drop-down list, select "Sum".
46. Mark the **Show Grand Total** check box.
47. Mark the **Show subtotal in group footer** check box.

Group, Sort, and Total

Group on Credit from selected to cleared, by entire value, with Amount totaled, with title click to add, with a header section, with a footer section, do not keep

Sort by TransDate

Sort by Description

Totals

Total On Amount

Type Sum

Show Grand Total

Show group subtotal as % of Grand Total

Show subtotal in group header

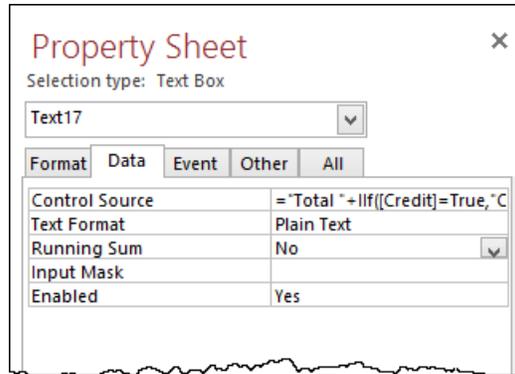
Show subtotal in group footer

Report Header				
Uncleared Bank Transactions				
Page Header				
Date	Code	Description	Amount	
Credit Header				
=Iff([Credit]=True,"Credits")				
Detail				
TransDate	Code	Description	Amount	
Credit Footer				
				=Sum([Amount])
Page Footer				
Report Footer				
				=Sum([Amount])

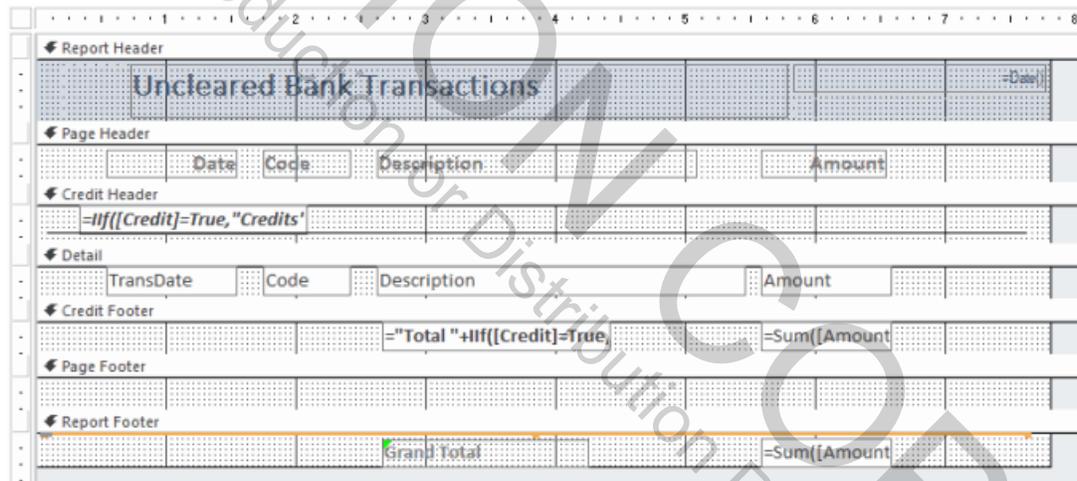
48. In the Credit Header, select the label, right-click, and select **Copy**.

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49. In the Credit Footer, right-click and select **Paste**.
50. Open the property sheet for the Credit Footer label and select the **Data** tab.
51. In the **Control Source** field, place your cursor immediately after the "=" sign and type "Total" followed by "+".

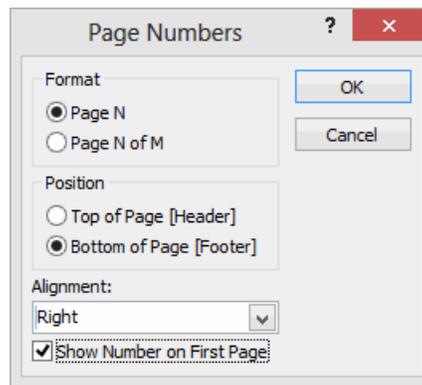


52. Move and format the label as desired.
53. Remove the alternate formatting on the group footer.
54. In the Report Footer, add a label for the report totals.
55. In the label, type "Grand Total".
56. Above the label, add a line from near the left edge to near the right edge.



57. On the **Report Design Tools: Design** tab in the **Header/Footer** group, click **Page Numbers**.
58. In the **Page Numbers** dialog box, in the **Format** field, select "Page N".
59. In the **Position** field, select "Bottom of Page [Footer]".
60. In the **Alignment** field, select "Right".

61. Mark or clear the **Show Number on First Page** check box as you prefer.



62. Click **OK**.

Reports

63. Format the page number as desired.

The screenshot shows the design grid for a report titled "Uncleared Bank Transactions". The grid is organized into sections: Report Header, Page Header, Credit Header, Detail, Credit Footer, Page Footer, and Report Footer. The Page Footer section is highlighted with an orange border, showing the formula "=Page * & (Page)".

64. Preview the report.

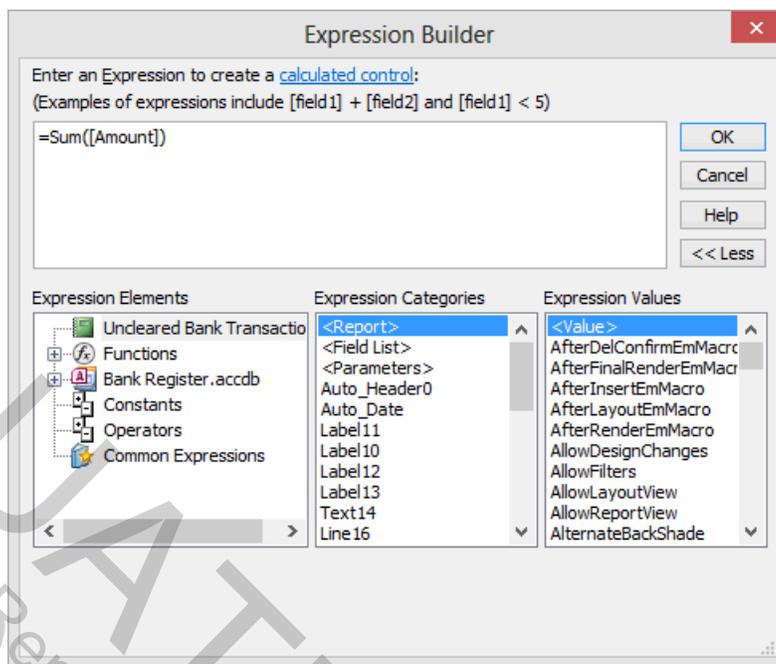
The preview shows the report output. The title is "Uncleared Bank Transactions" and the date is "Thursday, July 25, 2013". The report is divided into "Credits" and "Debits" sections. The "Credits" section lists three transactions with a total of \$1,469.47. The "Debits" section lists seven transactions with a total of \$865.04. The "Grand Total" is \$2,334.51.

Date	Code	Description	Amount
Credits			
4/14/2013	AD	US Dept of Treasury	\$372.96
4/16/2013	AD	Payroll deposit	\$1,095.62
4/29/2013	AD	Interest	\$0.89
Total Credits			\$1,469.47
Debits			
4/7/2013	7214	Charlottesville MUD	\$74.19
4/16/2013	DC	Main Street Market	\$134.51
4/18/2013	7215	SPARC Electric	\$169.47
4/20/2013	7216	Lolly's Place	\$24.18
4/23/2013	ATM	Cash withdrawal	\$120.00
4/23/2013	FT	Transfer to savings	\$300.00
4/26/2013	7217	Basket World	\$42.69
Total Debits			\$865.04
Grand Total			\$2,334.51

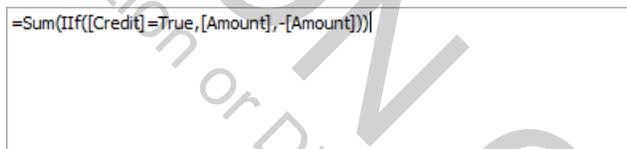
65. Notice that the grand total is incorrect. That's because we treated credits and debits both as positive numbers and simply added them up. To fix this, first select the total field in the report footer.

66. Open the property sheet and select the **Data** tab.

67. In the **Control Source** field, click .



68. In the expression pane, we need to replace the expression with an expression that will add the credits and add the negative of the debits. To do this, type "`=Sum(IIf([Credit]=True,[Amount],[-Amount]))`".



69. Click **OK**.

Reports

70. Preview the report.

Uncleared Bank Transactions				Thursday, July 25, 2013
Date	Code	Description	Amount	
Credits				
4/14/2013	AD	US Dept of Treasury	\$372.96	
4/16/2013	AD	Payroll deposit	\$1,095.62	
4/29/2013	AD	Interest	\$0.89	
		Total Credits	\$1,469.47	
Debits				
4/7/2013	7214	Charlottesville MUD	\$74.19	
4/16/2013	DC	Main Street Market	\$134.51	
4/18/2013	7215	SPARC Electric	\$169.47	
4/20/2013	7216	Lolly's Place	\$24.18	
4/23/2013	ATM	Cash withdrawal	\$120.00	
4/23/2013	FT	Transfer to savings	\$300.00	
4/26/2013	7217	Basket World	\$42.69	
		Total Debits	\$865.04	
		Grand Total	\$604.43	

71. Tweak the report as desired.

72. Save the report and name it "Uncleared Bank Transactions".

5.13 Conclusion

In this lesson, you learned:

- To create and format Access reports.
- To work with the various sections of a report.
- To group, sort, and add totals for records on a report.
- To work with the **Expression Builder**.
- To work with property sheets.

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