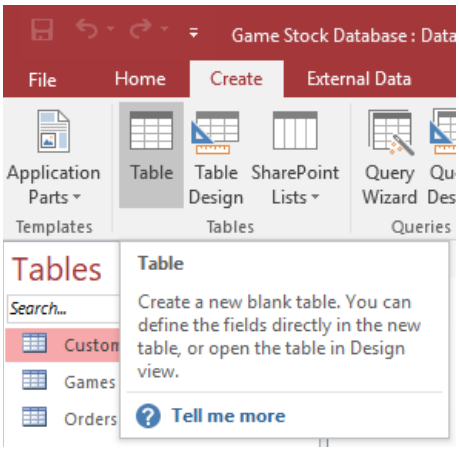
Year 9 Databases Lesson 4 Relational Databases

Introduction/Objectives:
By now, you've set up a table you need for your database and have created fields for the different categories. Next we need to create several more tables to enable us to create customer accounts and customer orders. Then we will link these tables together using the relationships function. Relationships provide Access with the means to bring this information together for you when you need it.

This lesson explains how to establish relationships between the tables in an Access database. You will learn how to read and manipulate the relationship map. You will also learn about primary and foreign keys, relationship types, and referential integrity.

Activity 1: Creating Tables – Customers table

By default, **Access** starts out with one table. To add two more tables to our database, click the **Create** tab on the **Ribbon**.



Next, select **Table** from the **Tables command group**. A new table will open in the active database object window. You must name your table using the **Save** command from **Microsoft Office menu**.

Adding fields to a table

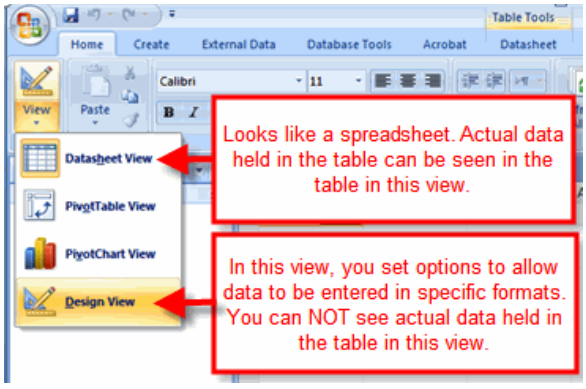
Access allows you to add fields to tables when you are:

- Working in **Datasheet view**, which looks like a spreadsheet
- Working in **Design view**, where you are able to set more controls for your fields

Either way, you need to know how to switch between the two views.

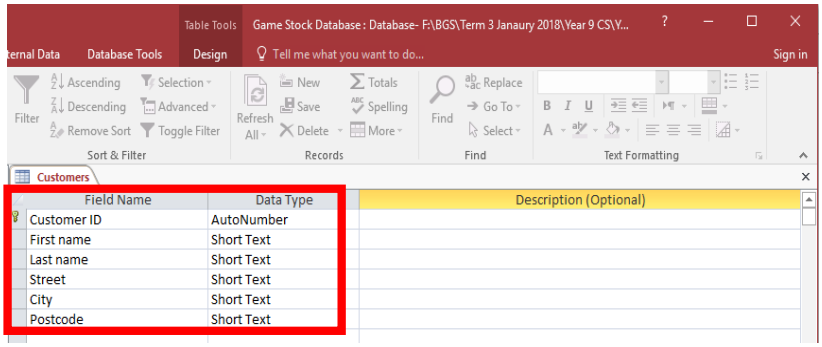
To switch views:

Select the **Views** command group from either the **Home** tab (see below) or the **Datasheet** tab on the **Ribbon**. Select the view option you want from the menu.



Adding fields in Design view

In **Design view**, the field names are along the left hand column instead of across the top like in Datasheet view, as seen below. To add a new field to a table in **Design view**, **click** in the cell where you want the new field and **type the field name**.



Setting the Data Type for a field:

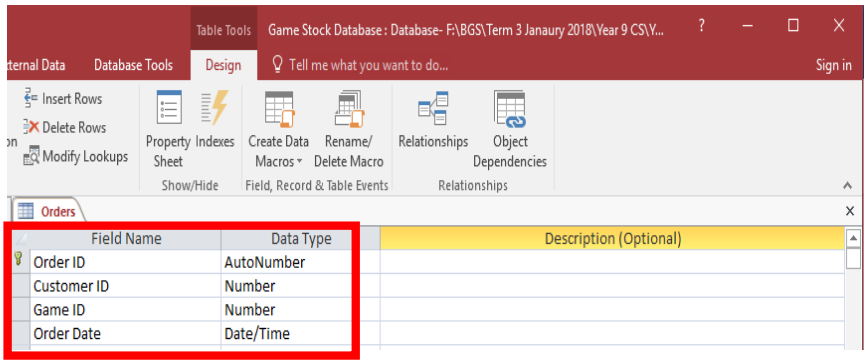
Click the field name, then press the **Tab** key on your keyboard. From the drop-down menu under the **Data Type** column, select the format you want.

The **data type** is more noticeable when the database is being populated with records. It will cause data to be formatted for currency, text, number, and date and time just like it does in Microsoft Excel.

Save this new table as **Customers**.

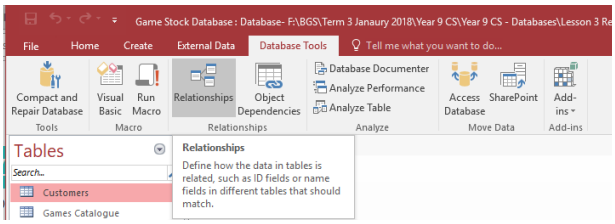
Activity 2: Creating Tables – Orders table

1. Create another **Table** called **Orders**.
2. Add **fields** (shown below) to the table.
3. Set the **data type** for a field in a table.
4. **Save** this new table.
5. **Open** the **Customers table** and **add** some fake names & addresses etc.
6. **Save this data**



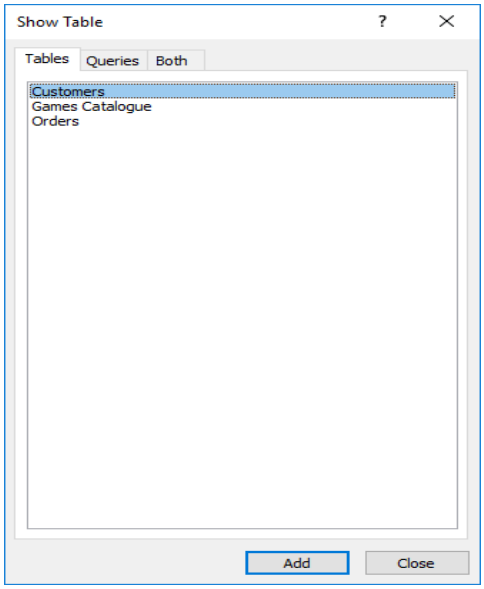
Activity 3: Establishing relationships between tables

NOTE: Tables must be **closed** in order to establish relationships. Click the **Relationships** command in the **Relationships** group on the **Database Tools** tab in the **Ribbon**.

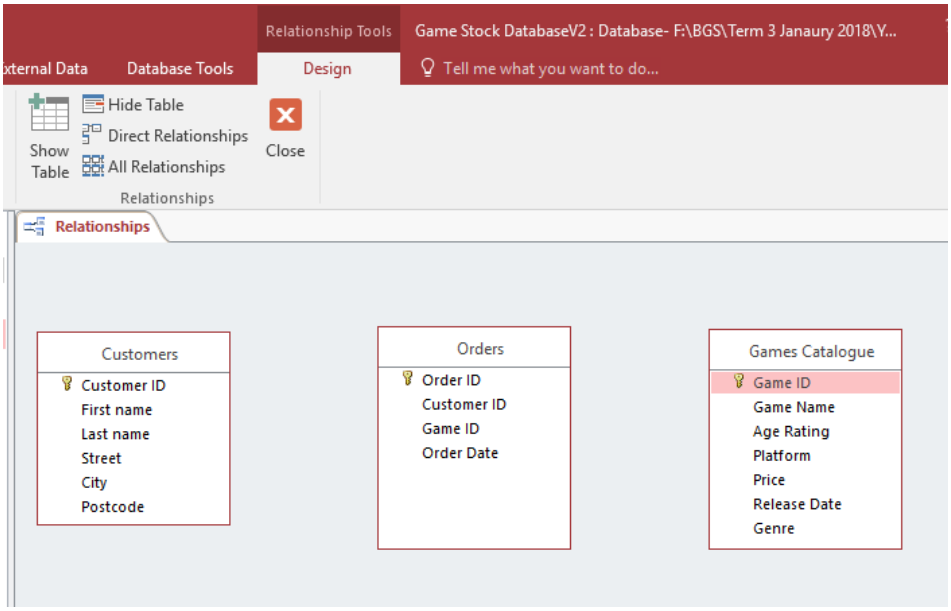


When the **Show Table** dialog box appears:

- Select each table name, then click **Add** for the **Customers**, **Games Catalogue** and **Orders** tables you want to relate.
- When you're done, close the Show Table dialog box.

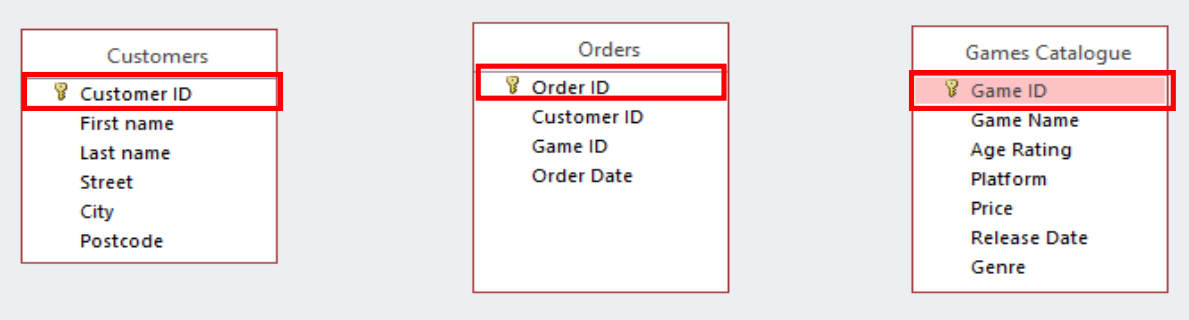


- You should now see a **relationship map** that contains all of the tables that were selected.
- **Move** each table as shown below:



Learn It - Understanding the relationship map

The relationship map lists all of the tables that were selected to relate, as well as all of the fields that were previously set up for that table. Notice that the first field has a key icon next to it. This is the **primary key** for the table.



Learn It - Primary and foreign keys

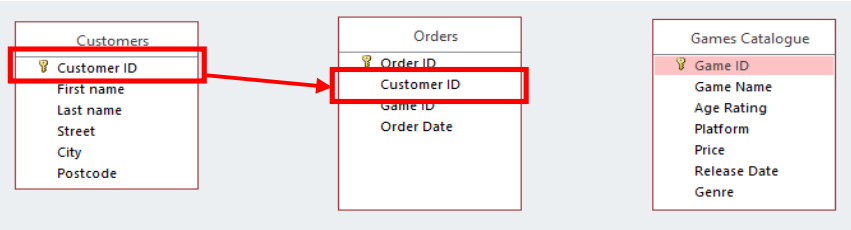
A **primary key** is the first field in each table of the database. You may recall that this field auto-numbers by default, so every record in the table has its own unique number to identify it. Access uses this number to quickly pull information together when you run queries or reports, which are covered later.

In the example above, the primary key for the Customers table is **Customer ID**, the primary key for the Orders table is **Order ID**, and the primary key for the Games Catalogue table is **Game ID**.

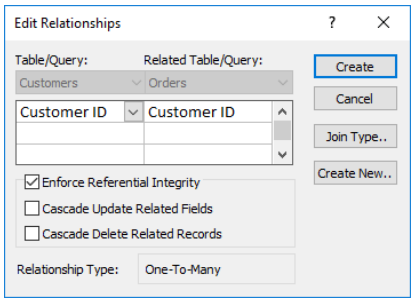
A **foreign key** is a field that is the primary field in its own table but that shows up in another table. If you look closely at the Orders table, the fields **Customer ID** and **Game ID** appear there, as well as in their own respective tables. These fields are the primary key in their own tables, but in the Orders table, they are considered **foreign keys**.

Activity 5: Relate tables with the drag-and-drop method – Customers to Orders

- Select the **Customer ID** field name from the **Customers table** by holding down the left mouse button.
- Drag the field name onto the **Customer ID field** in the **Orders table** you want to relate by releasing the left mouse button.
- In the example above, we selected the **Customer ID** field from the **Customers** table and dragged and dropped it on the **Customer ID** field in the **Orders** table.



- The **Edit Relationships** dialog box appears.



- Select the **Enforce Referential Integrity** option. This option is explained in detail below.
- Click **Create**.

Learn It - Understanding types of relationships

Access allows for several different types of relationships. These include:

- One-to-One
- One-to-Many
- Many-to-Many

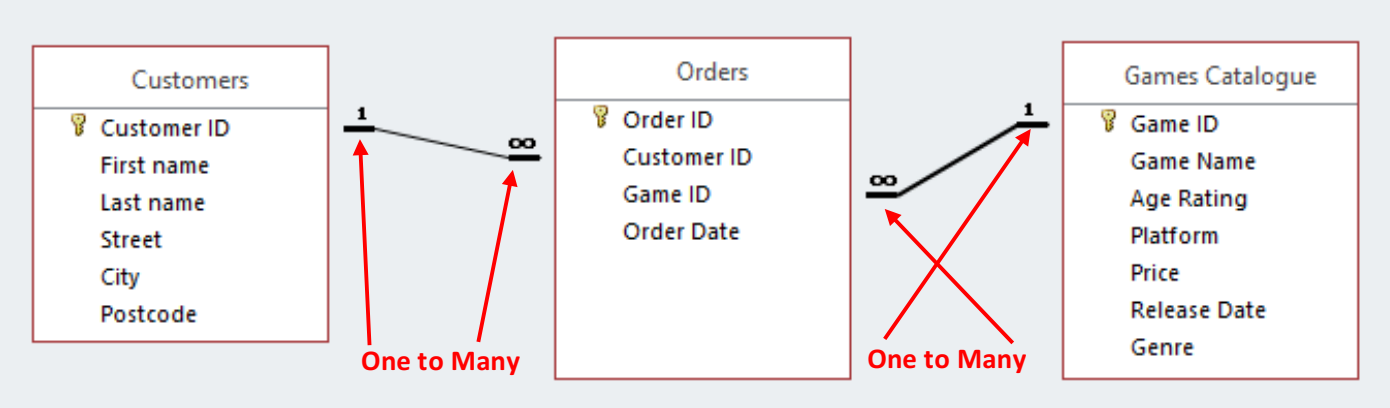
The relationship type you will come across most frequently—and the one created in our bookstore scenario—is the **One-to-Many** relationship.

One-to-Many

The One-to-Many relationship means data for that field will show up a single time in one table but many times in the related table.

For example, let's look at one of the game titles in our game store. The Game ID for the game should appear only once in the Games catalogue table because this table lists every title stocked in the store. But it will probably appear many times in the Orders table because we hope it gets ordered by many people many times.

The symbols for the **One-to-Many** relationship look like this:



Learn It - Enforcing referential integrity

In the **Edit Relationships** dialog box, an option to **Enforce Referential Integrity** appears.

You should click Enforce Referential Integrity to make sure you never have an order for a game that doesn't appear in the Games catalogue table. Selecting this option tells Access to check for these things when someone is working with your data records.

Activity 6: Relate Orders table to the Game Catalogue table

If you haven't already done so, **save** your Games catalogue database to **your computer**.

1. Open the database, and establish a relationship between the Customers table, Orders table and the Games Catalogue table using the drag-and-drop method previously shown.
2. Explore the options and settings in the Edit Relationships dialog box.
3. Move the tables around in the relationship map.
4. Save you completed database.

In your next lesson you will learn how to create forms to enter new data/orders and to display data in an organised and professional format.