



# Implementing a Database in MS Access





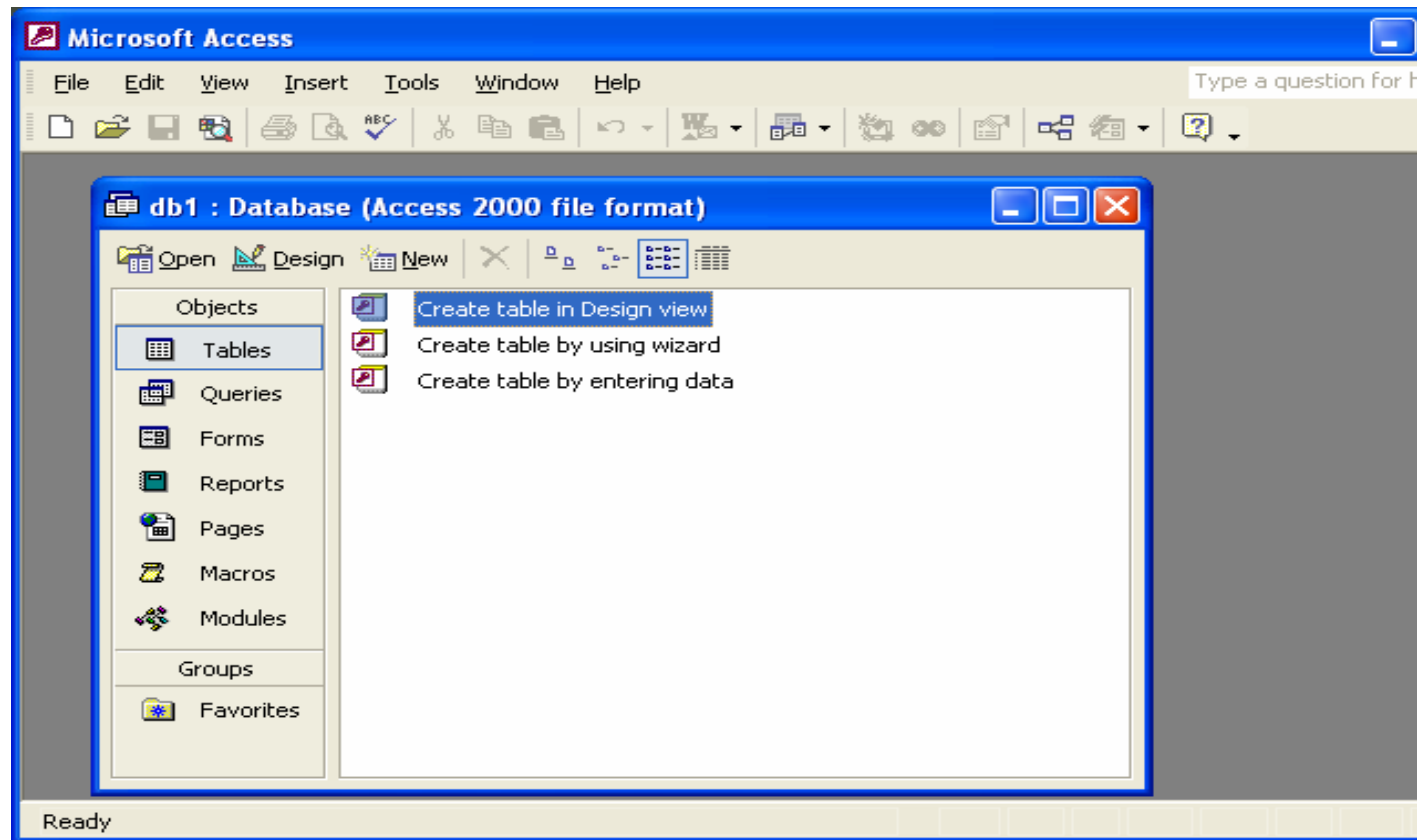
- Open Access
- Go to File ... New ... blank database
- Save as NPP.mdb





# Defining tables

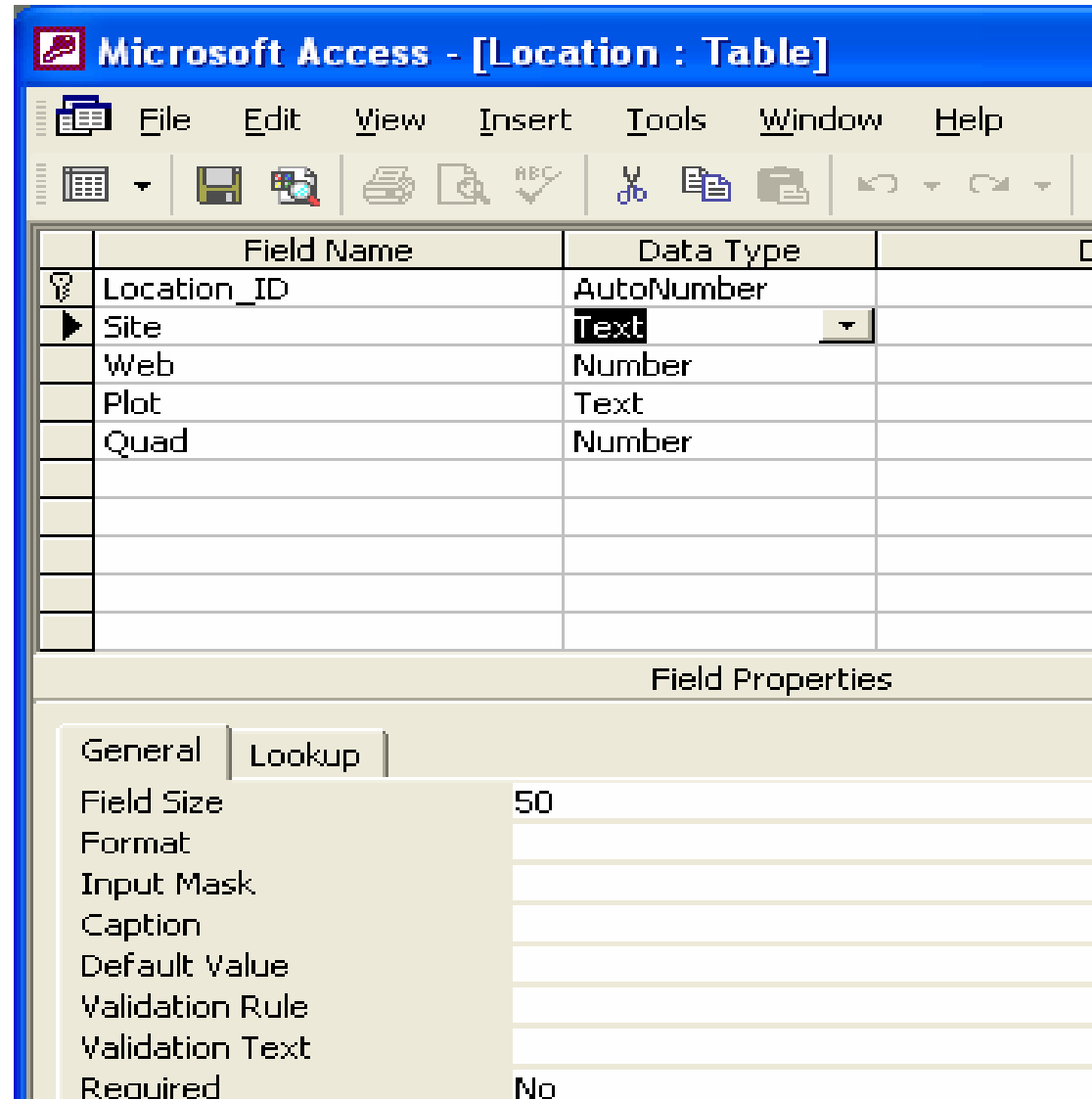
- Select “Tables” in the Objects column in the Database Window
- Select “Create table in Design View” by double-clicking





# Define the Location table

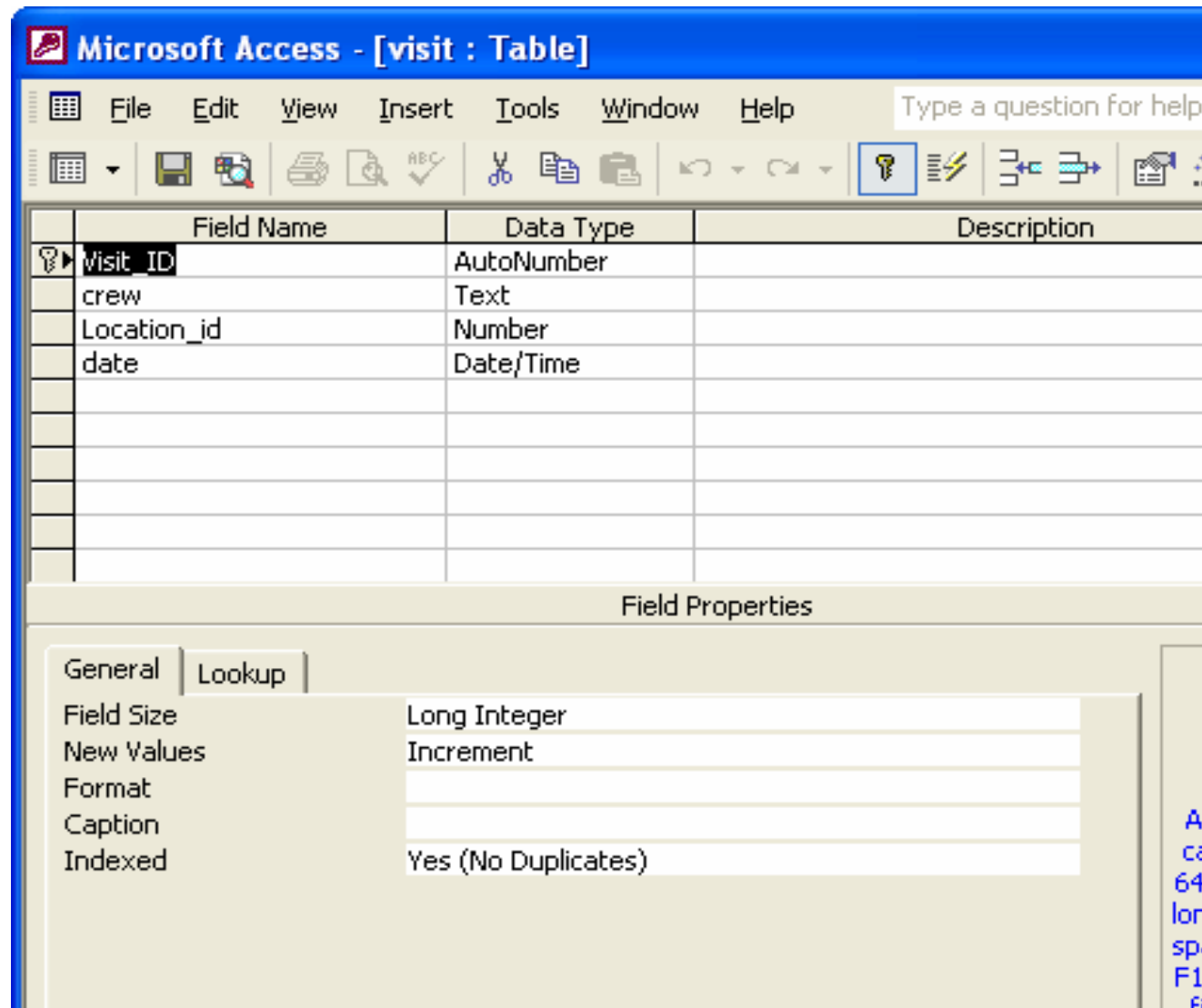
- Enter variable names and select the data types as shown
- Note that field size and other properties can be changed in the “Field Properties” area
- Right click on the box to the left of Location\_ID and select Primary Key
- Go to File > Save and save the table as Location
- Close the table by clicking on the X in the upper right-hand corner





# Define Visit table

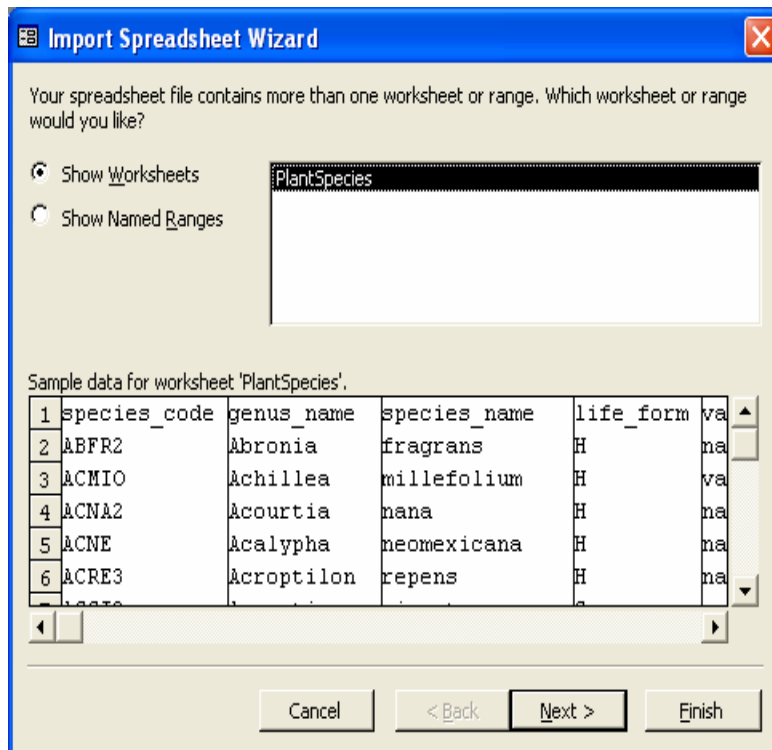
- Select “create table in design view” from the Database window
- Enter the fields as shown
- Make Visit\_ID the primary key
- Save table as “Visit” and close the table



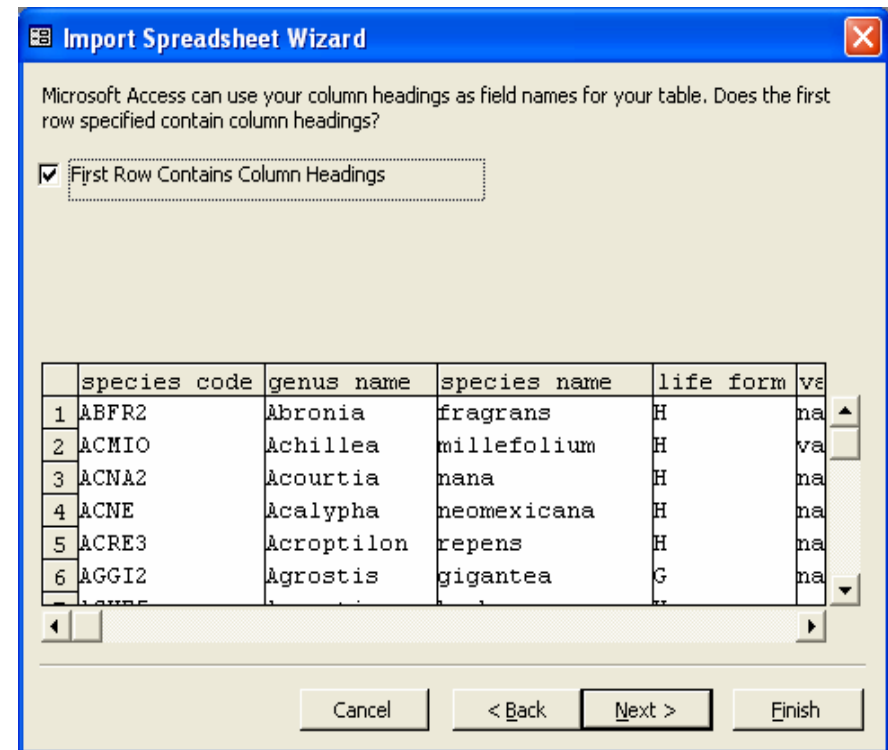


# Import PlantSpecies table

- Go to File ... Get External Data ... Import...



- Select 'Next'



- Check 'First Row Contains Column Headings'
- Next





# Import PlantSpecies table

**Import Spreadsheet Wizard**

You can store your data in a new table or in an existing table.

Where would you like to store your data?

☒ In a New Table

☐ In an Existing Table:

	species code	genus name	species name	life form	va
1	ABFR2	Abronia	fragrans	H	na
2	ACMIO	Achillea	millefolium	H	va
3	ACNA2	Acourtia	nana	H	na
4	ACNE	Acalypha	neomexicana	H	na
5	ACRE3	Acroptilon	repens	H	na
6	AGGI2	Agrostis	gigantea	G	na

Cancel < Back Next > Finish



**Import Spreadsheet Wizard**

You can specify information about each of the fields you are importing. Select fields in the area below. You can then modify field information in the 'Field Options' area.

Field Options

Field Name:  Data Type:

Indexed: ☒ Yes (No Duplicates) ☐ Do not import field (Skip)

	species code	genus name	species name	life form	va
1	ABFR2	Abronia	fragrans	H	na
2	ACMIO	Achillea	millefolium	H	va
3	ACNA2	Acourtia	nana	H	na
4	ACNE	Acalypha	neomexicana	H	na
5	ACRE3	Acroptilon	repens	H	na
6	AGGI2	Agrostis	gigantea	G	na

Cancel < Back Next > Finish

- Select 'In a New Table'
- Next

- For species\_code you can specify Indexed with no duplicates, because this will be the primary key





# Finish Importing PlantSpecies Table

**Import Spreadsheet Wizard**

Microsoft Access recommends that you define a primary key for your new table. A primary key is used to uniquely identify each record in your table. It allows you to retrieve data more quickly.

☐ Let Access add primary key.

☒ Choose my own primary key.

☐ No primary key.

	species code	genus name	species name	life form	va
1	ABFR2	Abronia	fragrans	H	na
2	ACMIO	Achillea	millefolium	H	va
3	ACNA2	Acourtia	nana	H	na
4	ACNE	Acalypha	neomexicana	H	na
5	ACRE3	Acroptilon	repens	H	na
6	AGGI2	Agrostis	gigantea	G	na

Cancel < Back Next > Finish

- ❑ Select "choose my own primary key" and choose species\_code from the drop-down list

❑ Next

**Import Spreadsheet Wizard**

That's all the information the wizard needs to import your data.

Import to Table:

☐ Display Help after the wizard is finished.

Cancel < Back Next > Finish

- Accept the name PlantSpecies for the table
- Select 'Finish'

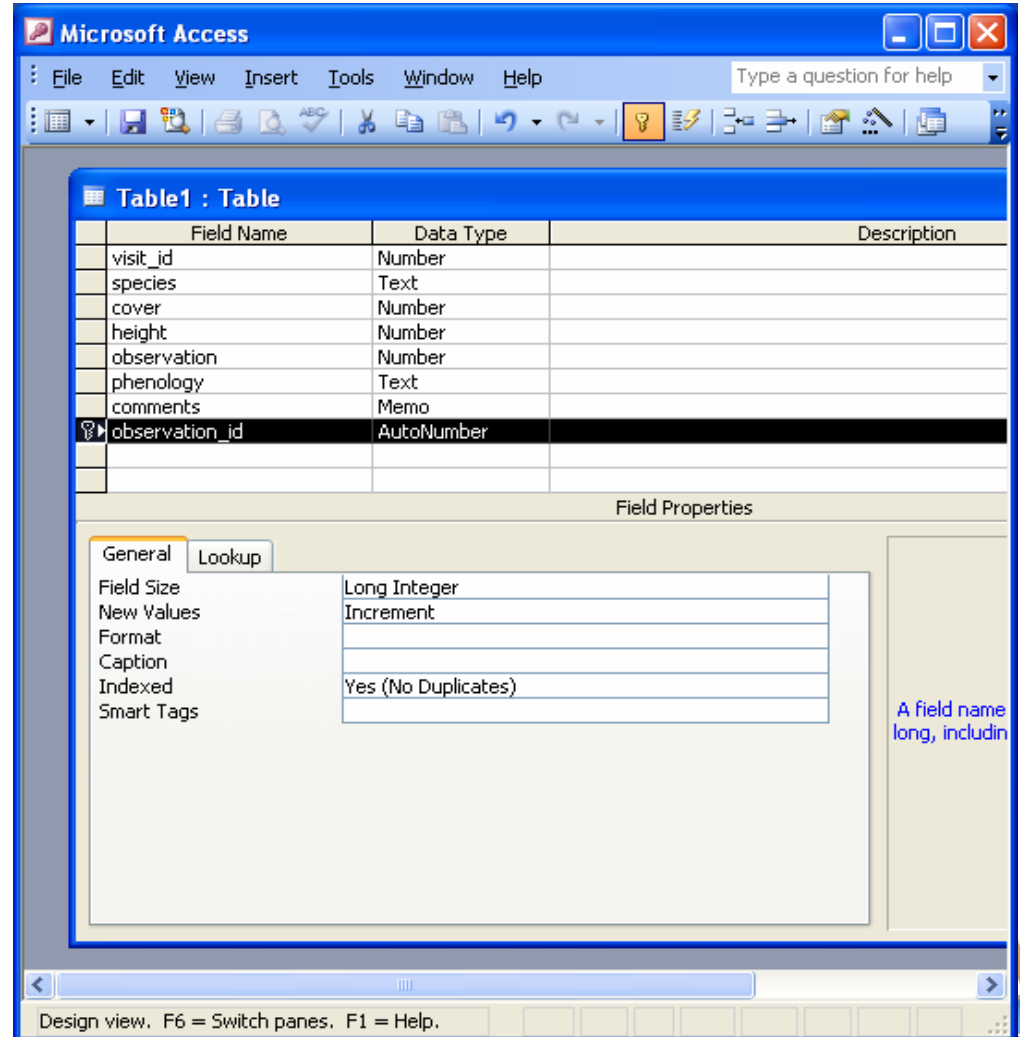






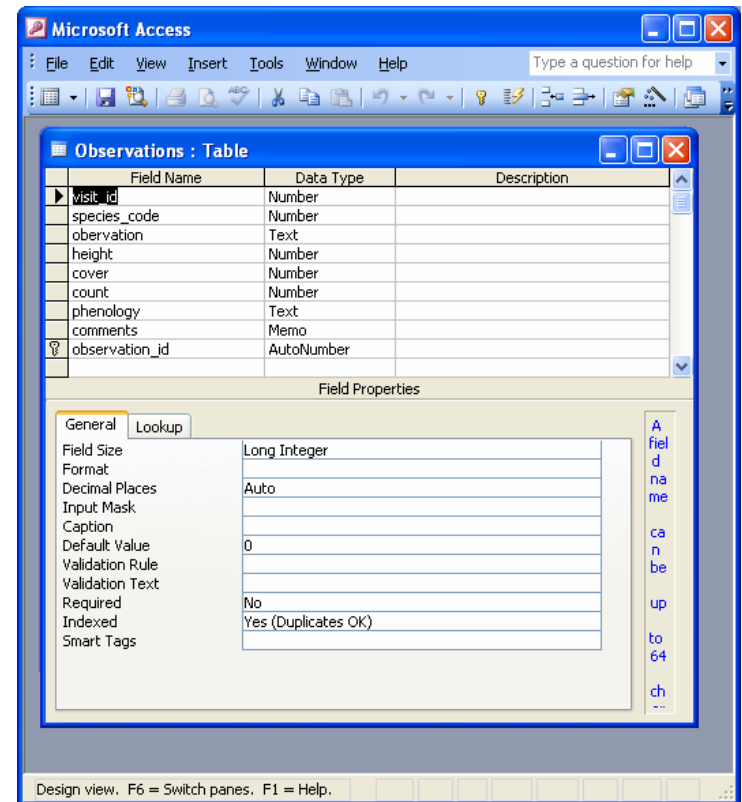
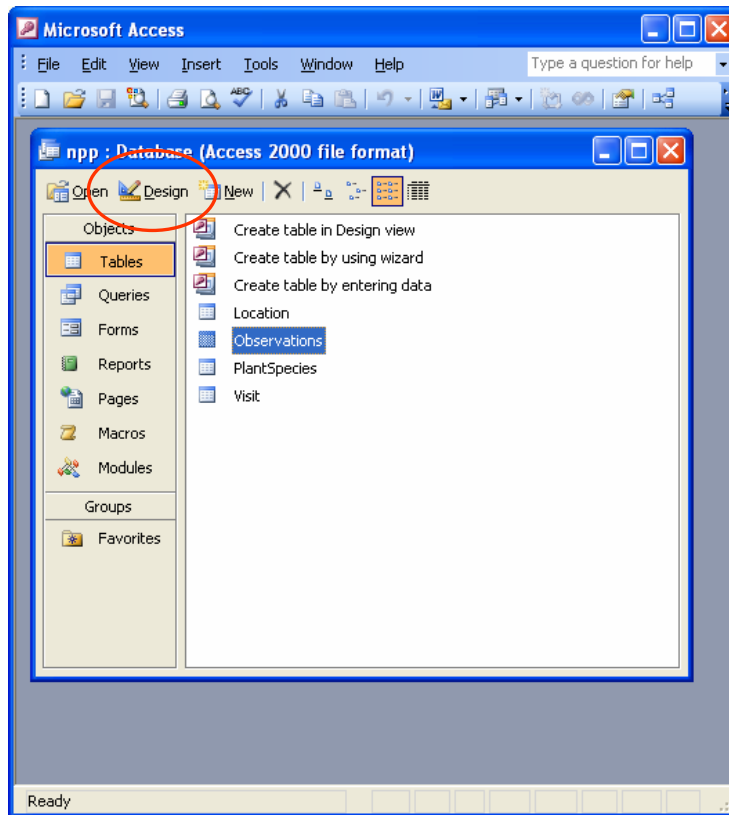
# Define Observation Table

- Select "Create table in Design View" from the database window
- Enter the fields as shown
- Make observation\_id the primary key
- Save the table and name it Observation





# Open Observation Table in Design View



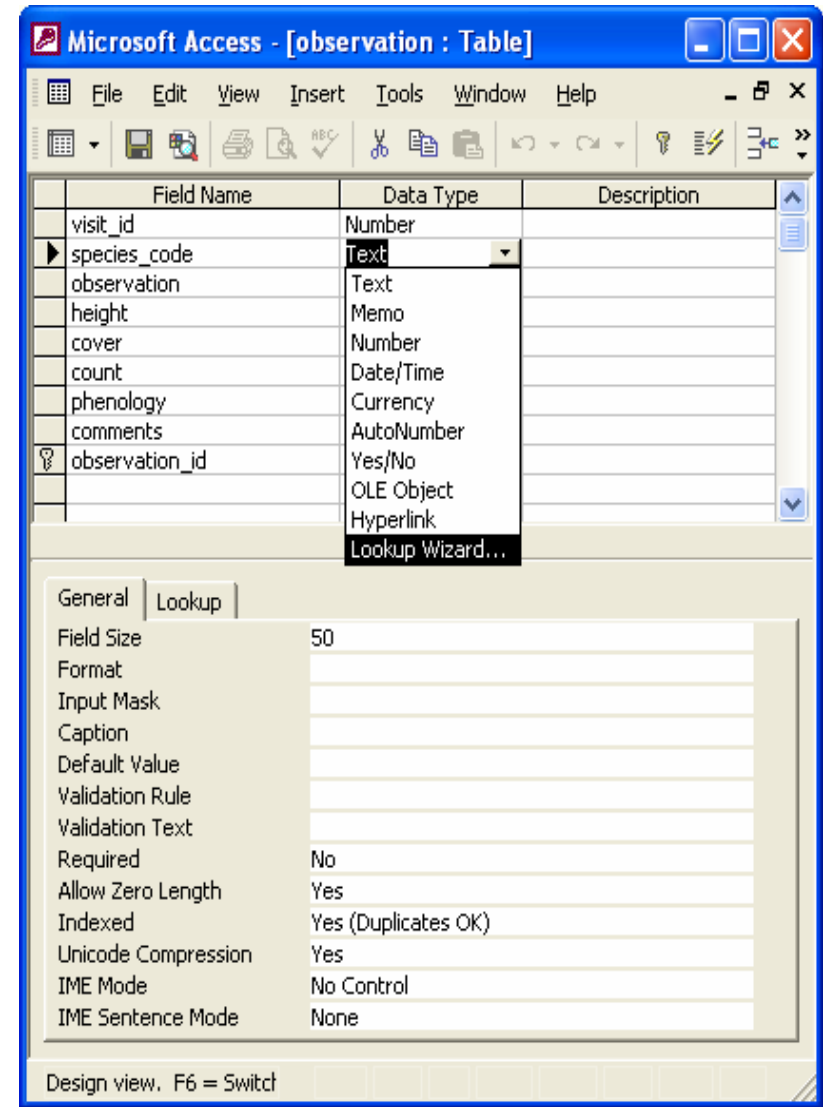
- Highlight the Observation table, and then click on 'Design'





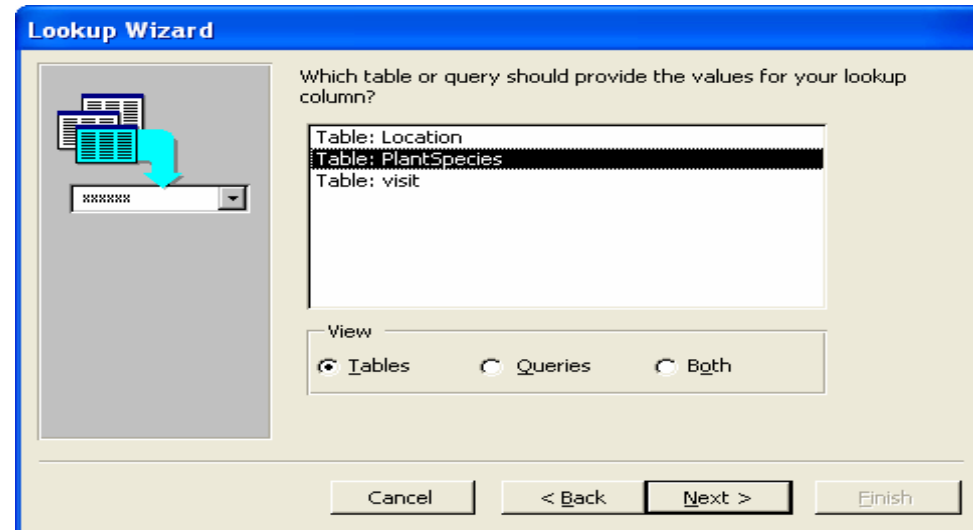
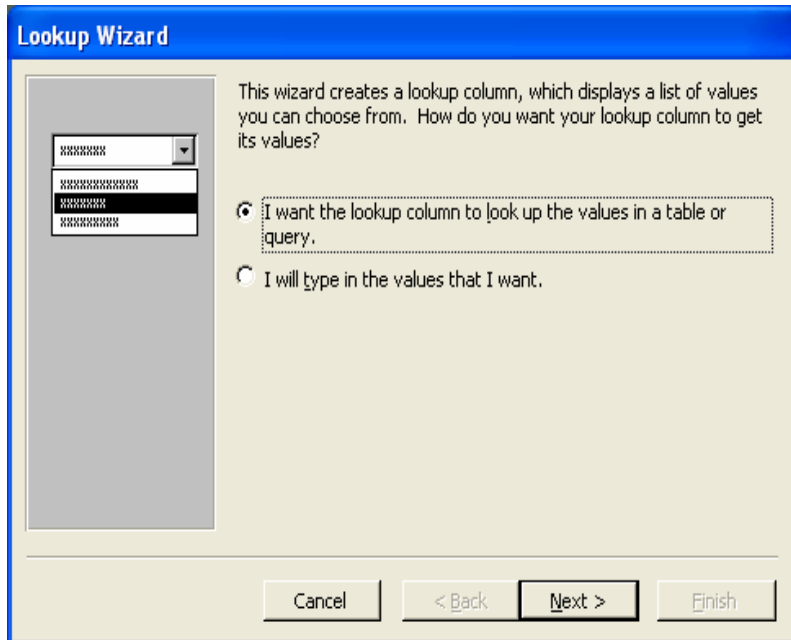
# Constrain entries in Species\_code field to the species codes listed in the PlantSpecies table

- Select Lookup Wizard under Data Type for species\_code





# Using the lookup wizard



- ❑ The lookup column will use records in the table PlantSpecies





# Using the lookup wizard

Lookup Wizard

Which fields contain the values you want included in your lookup column? The fields you select become columns in your lookup column.

Available Fields:

- ID
- species\_code
- genus\_name
- species\_name
- life\_form
- variety\_subspecies
- author
- family

Selected Fields:

Cancel < Back Next > Finish



Lookup Wizard

Which fields contain the values you want included in your lookup column? The fields you select become columns in your lookup column.

Available Fields:

- ID
- life\_form
- variety\_subspecies
- author
- family

Selected Fields:

- species\_code
- genus\_name
- species\_name

Cancel < Back Next > Finish

- ❑ Select species\_code, genus\_name, and species\_name

- ❑ Next





# Using the lookup wizard

**Lookup Wizard**

What sort order do you want for your list?

You can sort records by up to four fields, in either ascending or descending order.

1

2

3

4



**Lookup Wizard**

How wide would you like the columns in your lookup column?

To adjust the width of a column, drag its right edge to the width you want, or double-click the right edge of the column heading to get the best fit.

☒ Hide key column (recommended)

species_code	genus_name	species_name
ABFR2	Abronia	fragrans
ACMIO	Achillea	millefolium
ACNA2	Acourtia	nana
ACNE	Acalypha	neomexicana
ACRE3	Acroptilon	repens
AGGI2	Agrostis	gigantea
AGHE5	Ageratina	herbacea

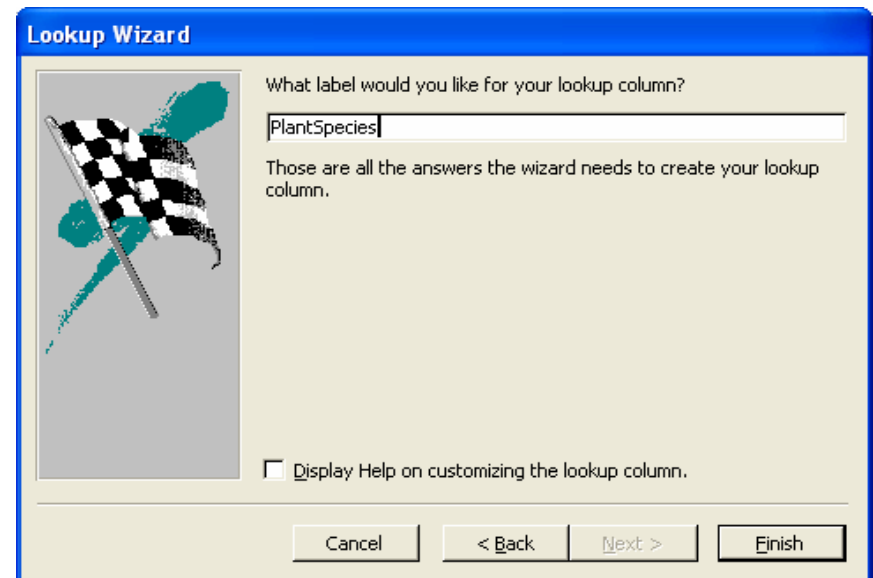
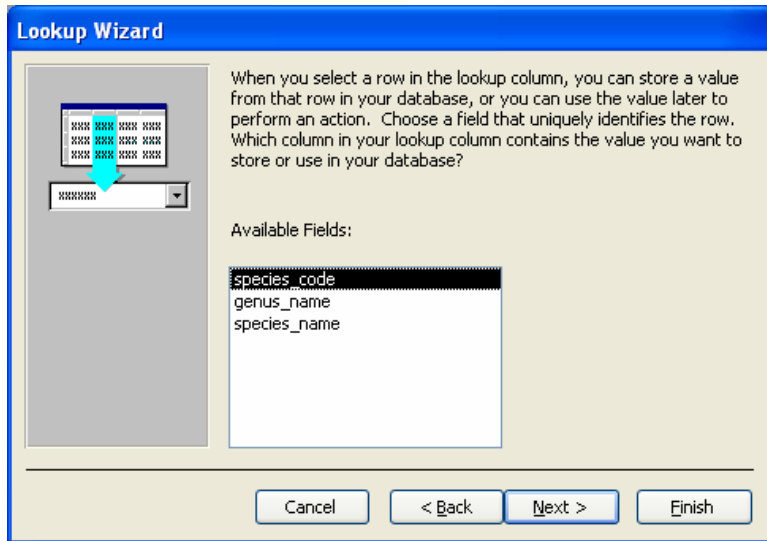
- ❑ Select ascending order on species\_code

- ❑ If Species\_code is not visible, uncheck the Hide Key Column box





# Using the lookup wizard



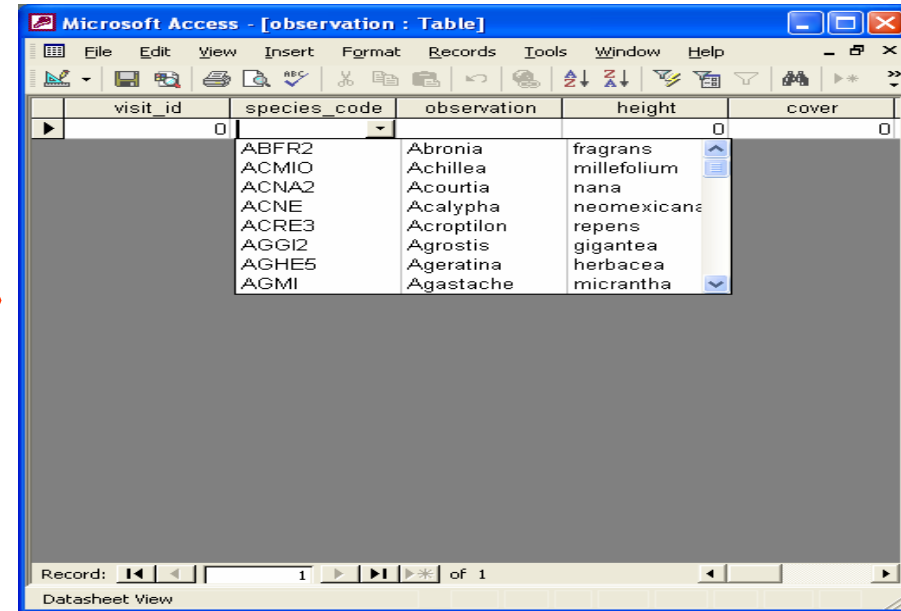
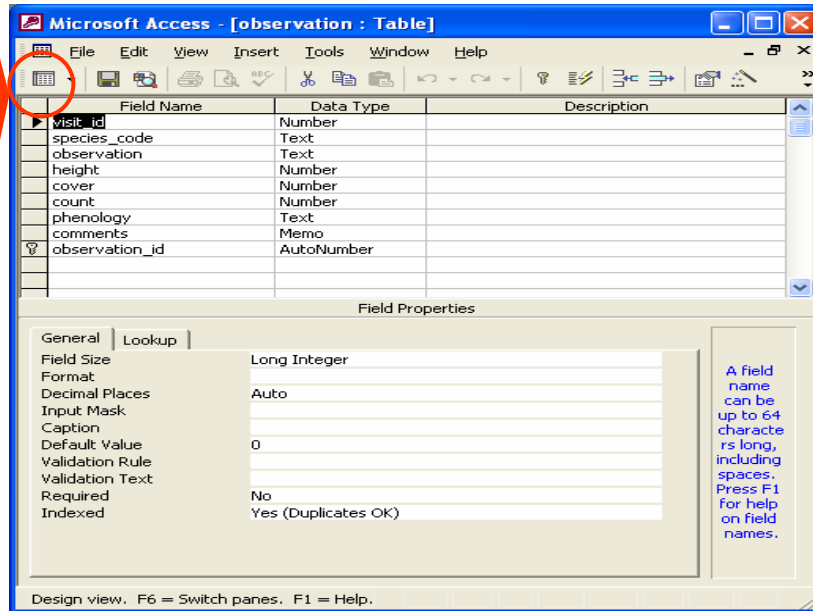
- ❑ Accept species\_code as the value to be stored in the database
- ❑ Next
- ❑ Accept PlantSpecies as the default name for the lookup column
- ❑ Click Finish







# Switch between design and table view



- Click on View button in upper left-hand corner to switch from "design view" to "datasheet view"
- Click in the species\_code field to see the drop-down list
- CLOSE the observation table

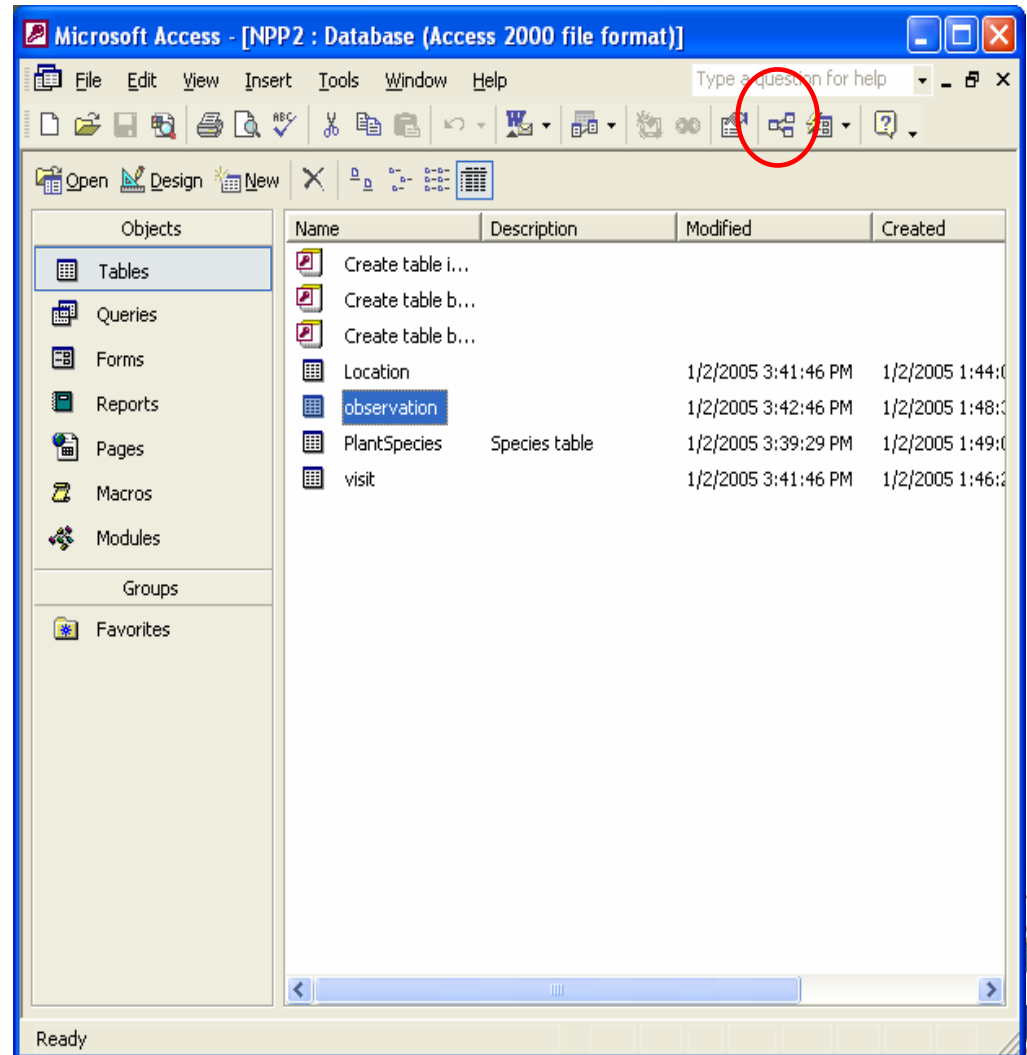






# Define relationships between tables

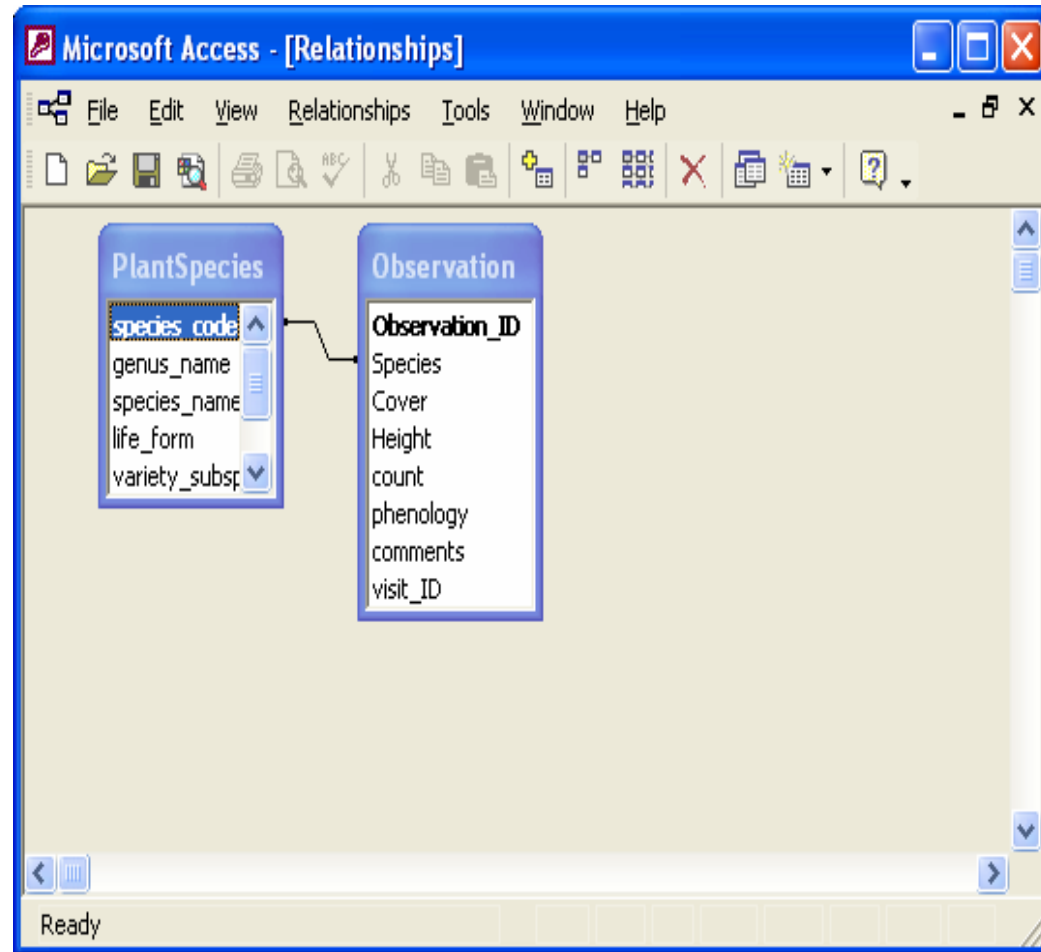
- Click on the "relationship" icon in the database window





# Define relationships: add tables to the relationships window

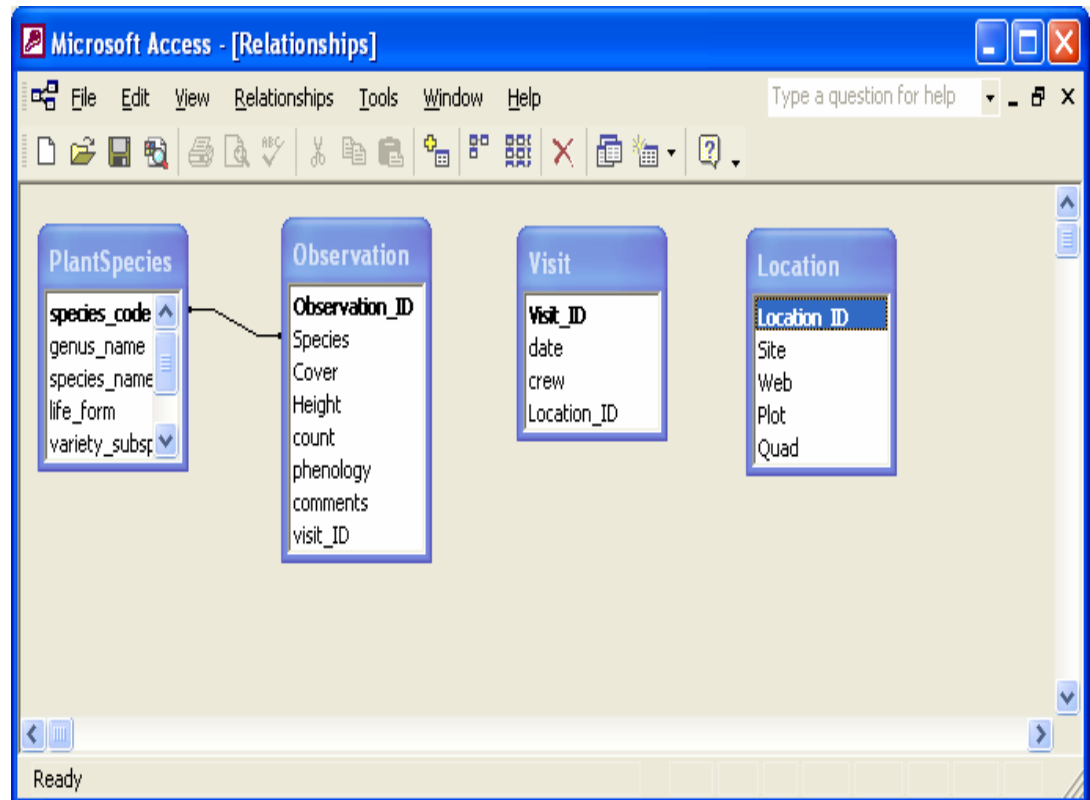
- PlantSpecies and Observation are already shown in the relationships window because a relationship was defined with the Lookup wizard
- Right click in the window and choose “Show table” to add the Location and Visit tables
- Close the “Show Table” window





# Create relationship between Location and visit tables

- left-click and hold on Location\_ID in the Location table and drag the icon overtop of Location\_ID in the visit table





# Edit relationships

- Enforce referential Integrity (this means that you won't be able to delete a record in the Location table if there is a related table in the Visit table)
- Note that the relationship being created is One-to-Many
- Click on "Create"

**Edit Relationships**

Table/Query: Location      Related Table/Query: visit

Location_ID	Location_id

☒ Enforce Referential Integrity

☐ Cascade Update Related Fields

☐ Cascade Delete Related Records

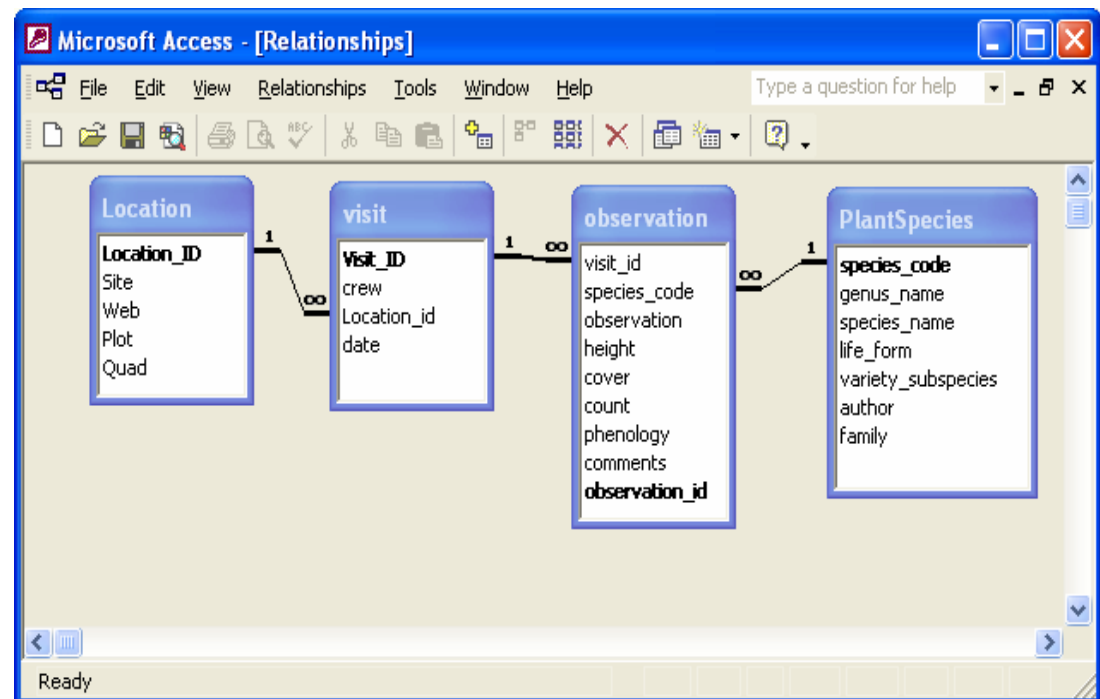
Relationship Type: One-To-Many

Buttons: Create, Cancel, Join Type.., Create New..



# Finish defining relationships

- Left click on Visit\_ID in Visit table and drag the icon overtop of Visit\_ID in the Observation table; enforce referential integrity
- Close the relationships window; save changes if prompted





Now create a data entry form similar to this one:

Microsoft Access - [Location]

File Edit View Insert Format Records Tools Window Help

MS Sans Serif 8 B I U

Site\_ID (AutoNumber)

Site

Web 0

Plot

Quad 0

visit

Visit\_ID (AutoNumber)

crew

site\_id 0

date

observation

visit\_id

species

cover 0

height 0

observation

phenology

comments

observation\_id (AutoNumber)

Record: 1 of 1

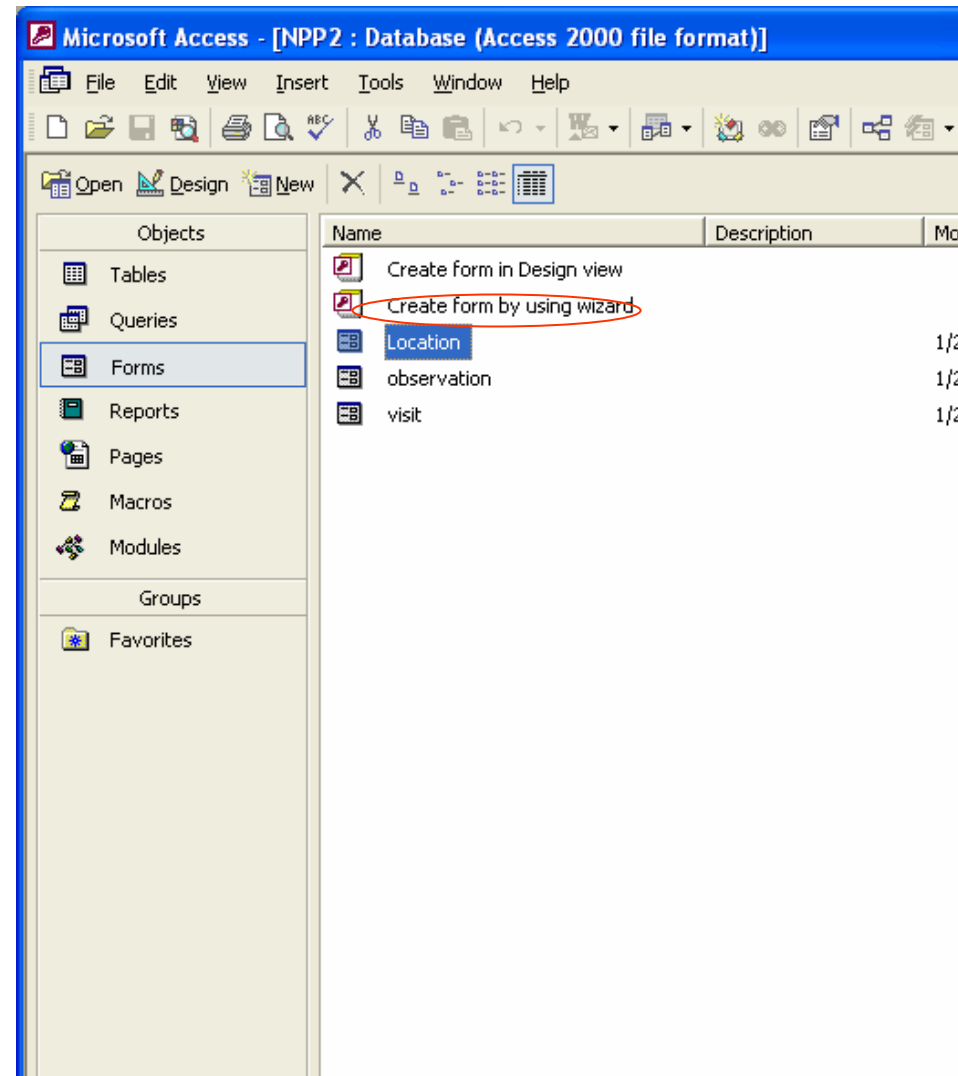
Record: 1 of 1

Form View





- Click on Forms in the database window
- Then click on "Create form by using wizard"





# Choose fields from the Location table to display in the form

**Form Wizard**

Which fields do you want on your form?  
You can choose from more than one table or query.

Tables/Queries  
Table: Location

Available Fields:

Location_ID	>
Site	>>
Web	<
Plot	<<
Quad	

Selected Fields:

Cancel < Back Next > Finish



**Form Wizard**

Which fields do you want on your form?  
You can choose from more than one table or query.

Tables/Queries  
Table: Location

Available Fields:

Selected Fields:

Location_ID
Site
Web
Plot
Quad

Cancel < Back Next > Finish

- Click on >> to accept all fields



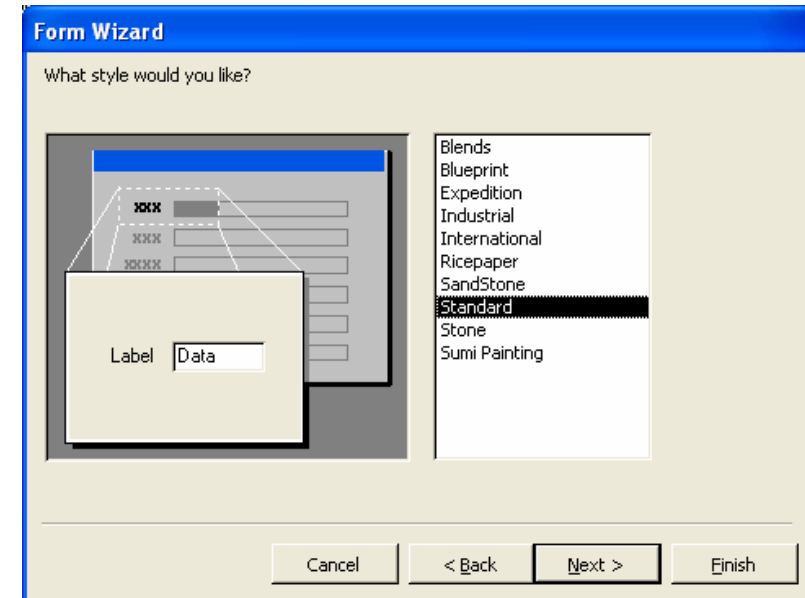




# Choose form appearance



- Choose "columnar"



- Choose "standard"





**Form Wizard**

What title do you want for your form?

Location

That's all the information the wizard needs to create your form.

Do you want to open the form or modify the form's design?

☒ Open the form to view or enter information.

☐ Modify the form's design.

☐ Display Help on working with the form?

Cancel < Back Next > Finish



**Microsoft Access - [Location1]**

File Edit View Insert Format Records Tools Window Help

MS Sans Serif 8

Site\_ID [AutoNumber]

Site

Web 0

Plot

Quad 0

Record: 1 of 1

Form View

- Accept 'Location' for the name of the table
- Click 'Finish'

- Your form will look like this





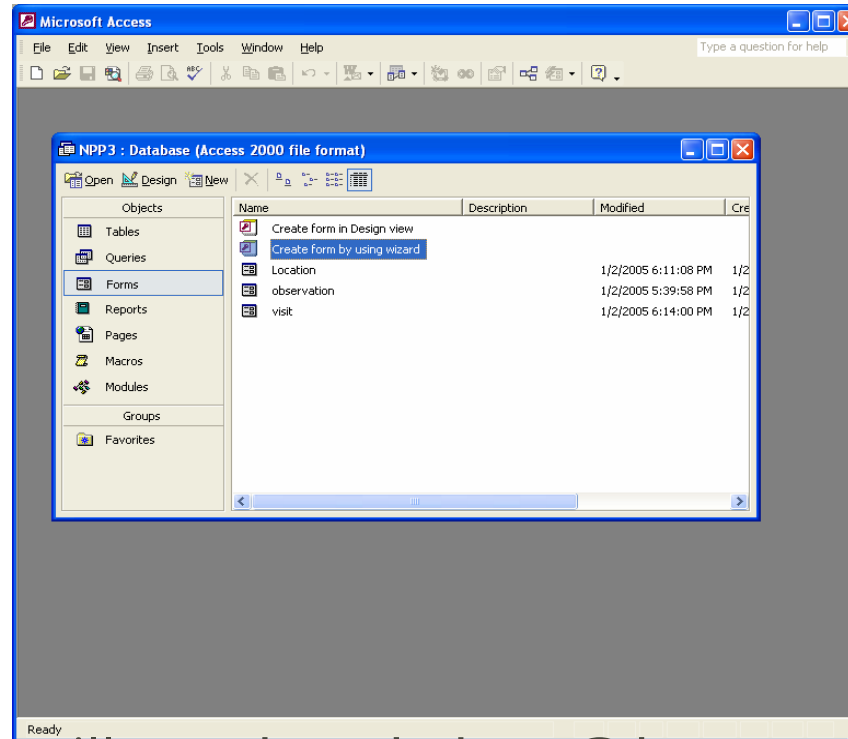
# Create more forms

- Create forms for the Visits table and the Observations table using the Form Wizard
- Put all fields in the forms

The screenshot shows the 'Form Wizard' dialog box in Microsoft Access. The title bar is blue and says 'Form Wizard'. Inside the dialog, there's a graphic showing a stack of tables with an arrow pointing to a form icon. To the right of the graphic, the text reads: 'Which fields do you want on your form?' and 'You can choose from more than one table or query.' Below this, there's a section titled 'Tables/Queries' with a list box containing the following items: 'Table: Location', 'Table: observation' (which is highlighted), 'Table: PlantSpecies', 'Table: visit', 'Table: visit', 'Web', 'Plot', and 'Quad'. To the right of the list box is a 'Selected Fields' section with an empty list box. Between the list box and the 'Selected Fields' list box are three buttons: '>>' (highlighted), '<', and '<<'. At the bottom of the dialog are four buttons: 'Cancel', '< Back', 'Next >', and 'Finish'.



# Create subforms



- Now you will embed the Observations table inside the Visit table, and then embed the Visit table inside the Location table





# Embed the Observation Table inside the Visit Table

Microsoft Access - [visit]

File Edit View Insert Format Records Tools Window

Help

MS Sans Serif 8 B I

Visit\_ID [AutoNumber]

crew

Location\_id 0

date

Record: 1 of 1

Form View



Microsoft Access - [visit : Form]

File Edit View Insert Format Tools Window Help

Form

Form Header

Detail

Visit\_ID Visit\_ID

crew crew

Location\_id Location\_id

date date

Form Footer

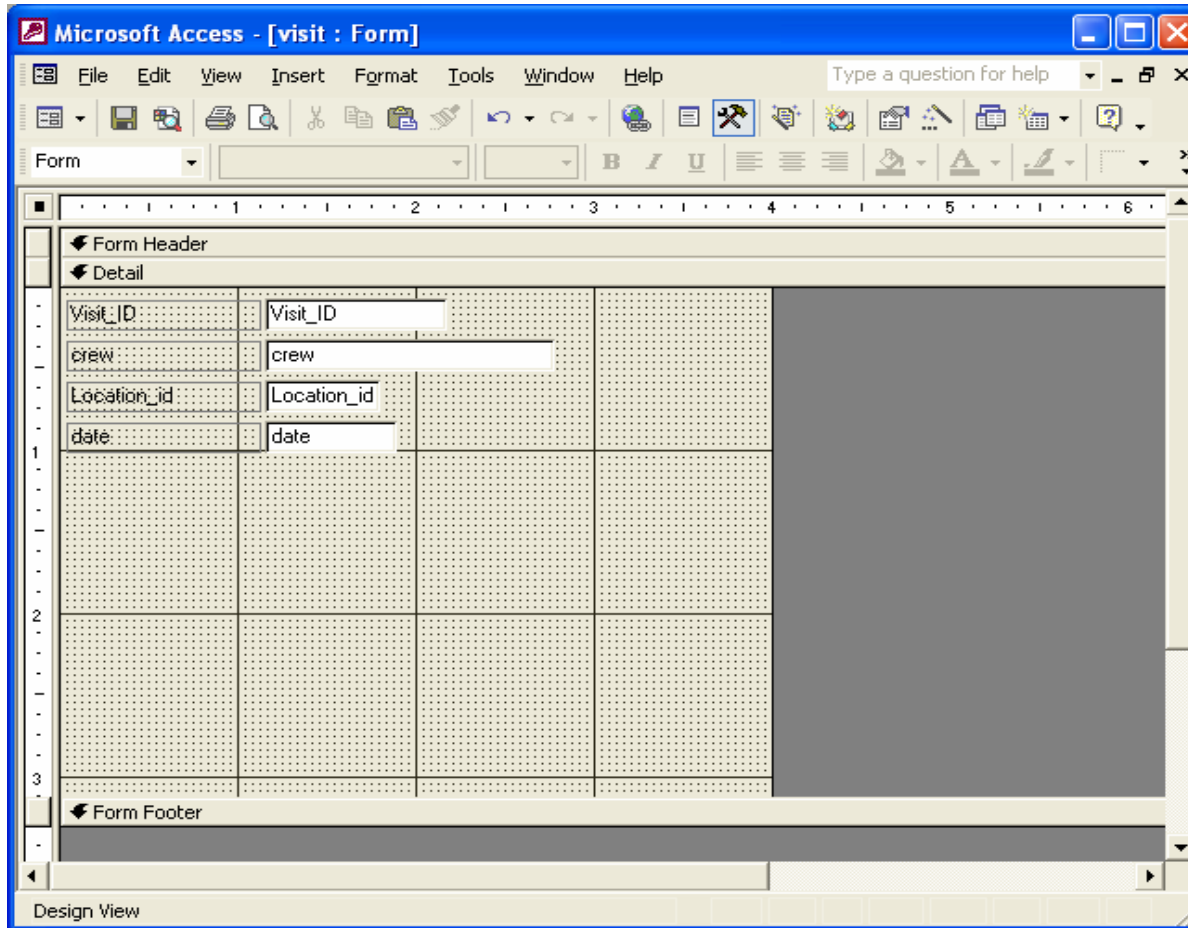
Design View

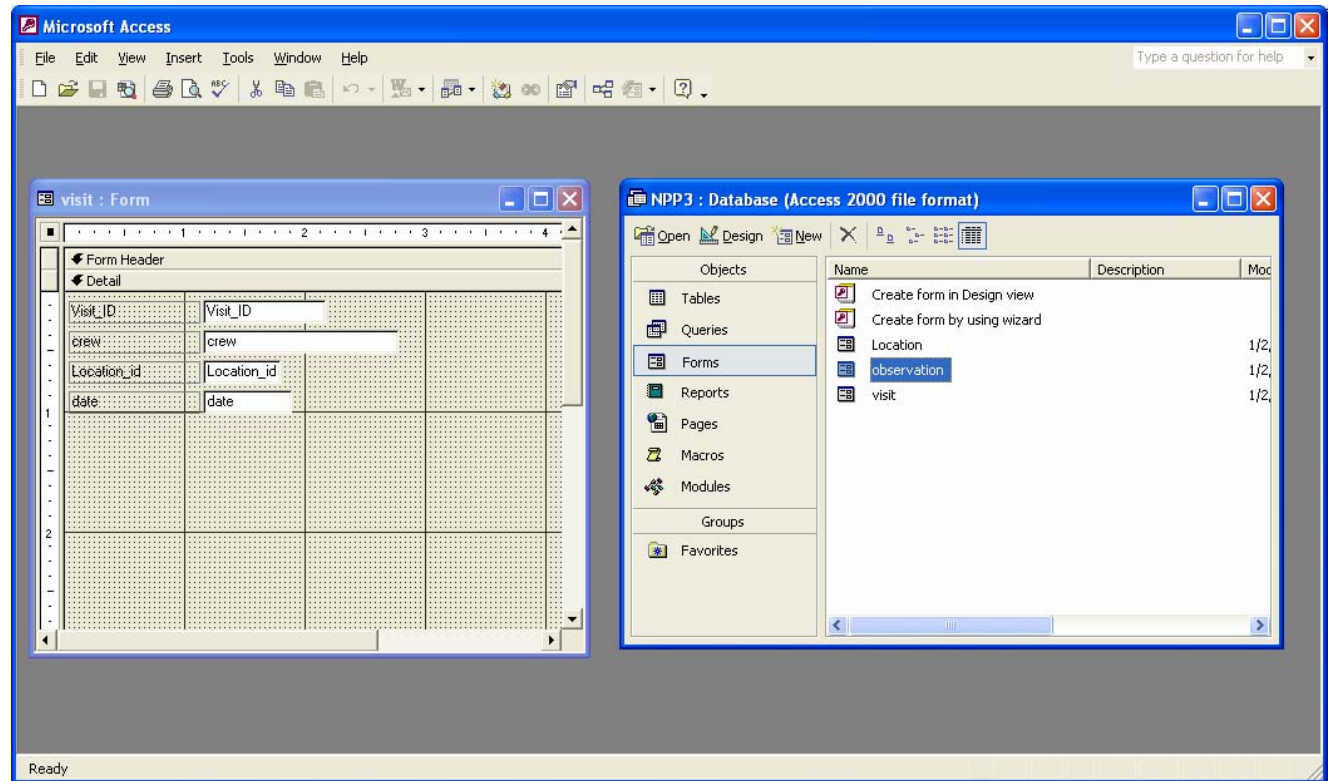
- Open the Visit form and then switch to Design View by clicking on the icon in the upper left hand corner





# Resize Visit form by clicking on footer and edges and dragging





- Position design view of Visit form and database window (with Forms selected) next to each other
- Left-click and hold on Observation form in Database window and drag it onto the Visit form







Microsoft Access - [visit : Form]

File Edit View Insert Format Tools Window Help

observation

Form Header

Detail

Visit\_ID Visit\_ID

crew crew

Location\_id Location\_id

date date

observation

Form Header

Detail

visit\_id visit\_id

species species\_code

cover cover

height height

observation observation

phenology phenology

comments comments

Form Footer

Design View



Microsoft Access - [visit]

File Edit View Insert Format Records Tools Window Help

MS Sans Serif 8

Visit\_ID [AutoNumber]

crew

Location\_id 0

date

observation

visit\_id

species

cover 0

height 0

observation

phenology

comments

observation\_id [AutoNumber]

Record: 1 of 1

Form View

- Click on the View icon to see the completed Visit form with the Observation form embedded within it
- Close and save changes to the Visit Form







# Embed the Visit form within the Location form

- Open the Location form in Design View and resize it so there is room to embed the Visit form

Microsoft Access - [Location : Form]

File Edit View Insert Format Tools Window Help

Form

Location\_ID Location\_ID

Site Site

Web Web

Plot Plot

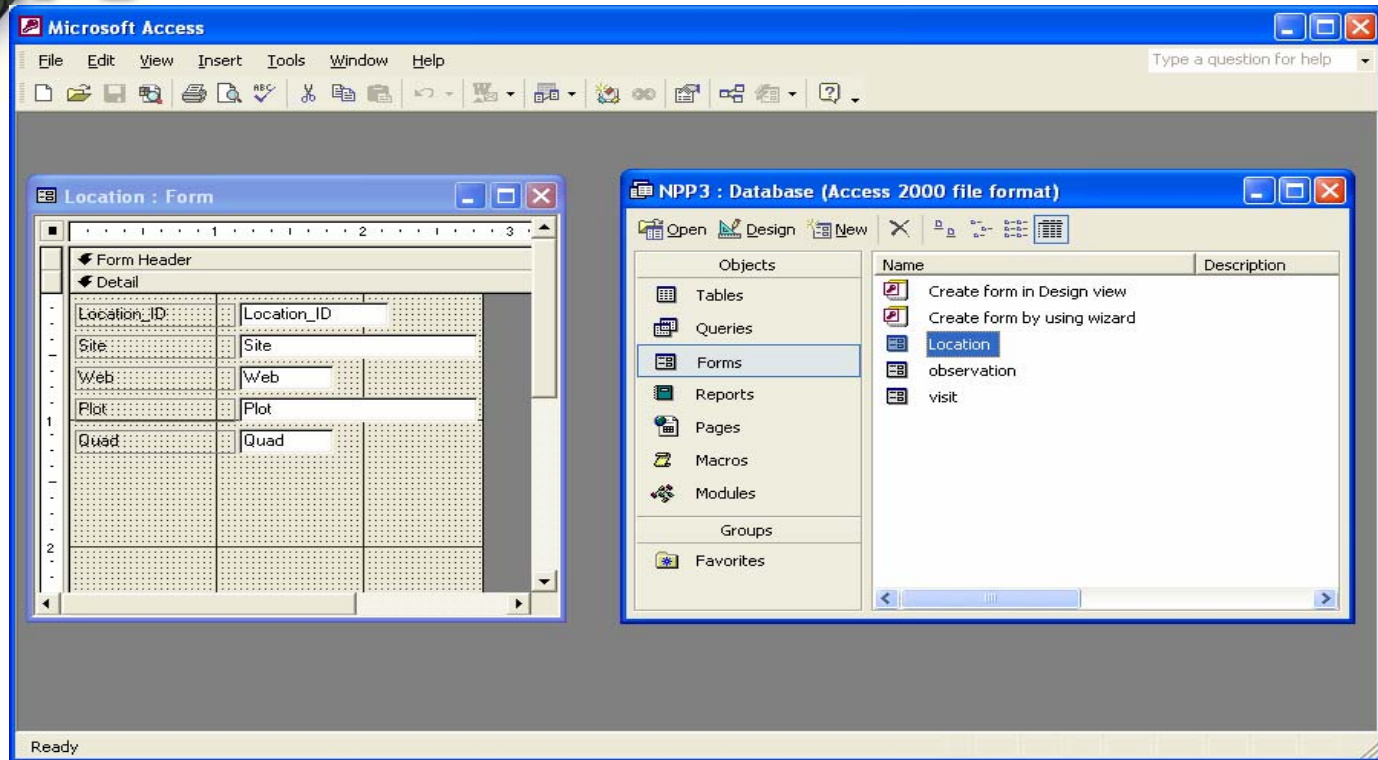
Quad Quad

Form Header

Detail

Form Footer

Design View



- Position design view of Location form and database window next to each other
- Left-click and hold on the visit form in the database window and drag it onto the Location form





# The finished form in design view

- Close and Save the form





# Enter some data

- Open the Location form
- You can enter multiple observations without having to re-enter visit or location information
- In the Location form: enter
  - Site = CM,
  - Web = 1,
  - Plot = N,
  - Quad = 2





# Enter some data

- In the Visit Form, enter
  - Crew = karen
  - Date = 6/25/2004
  - Note that visit\_id and location\_id are automatically filled in, and that Location\_ID is the same in both forms
- In the Observation form, enter
  - Species = bogr2
  - Cover = 10
  - Height = 13
  - Observation = 1
  - Phenology = fl
- Use the right arrow on the bottom of the observation form to advance to a new record
- Enter two more records in the Observation table

The screenshot shows the Microsoft Access interface with the 'Visit' form open. The 'Visit' form has fields for Location\_ID (AutoNumber), Site, Web (0), Plot, and Quad (0). The 'Observation' form is nested within the 'Visit' form and contains fields for Visit\_ID (AutoNumber), crew, Location\_id, date, visit\_id, species, cover (0), height (0), observation, phenology, comments, and observation\_id (AutoNumber). The record bar at the bottom of the Observation form shows 'Record: 1 of 1' with navigation buttons. An arrow points to the right arrow button, labeled 'Record Advance'.





# View the entered data

Microsoft Access - [Location : Table]

File Edit View Insert Format Records Tools Window Help

	Site_ID	Site	Web	Plot	Quad
▶ +	2	CM	1	N	1
*	(AutoNumber)		0		0

Record: 1 of 1

Datasheet View



Microsoft Access - [Location : Table]

File Edit View Insert Format Records Tools Window Help

Type a question for help

Ask a Question

Site_ID	Site	Web	Plot	Quad		
2	CM	1	N	1		
Visit_ID	crew	date				
2	karen	6/24/2005				
species	cover	height	observation	phenology	comments	observation
boer4	1	23	1	fl	oryx track	1
bogr2	1	12	2	fl		2
asmim	3	12	16	fr		3
*	0	0	0			

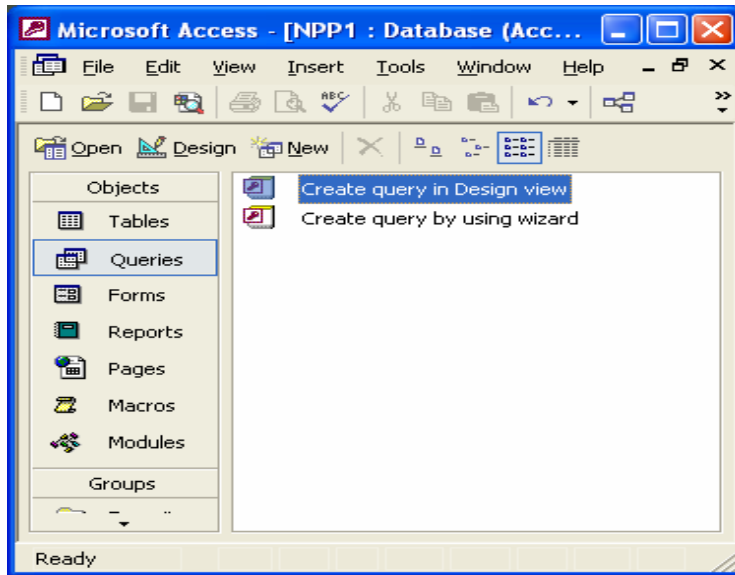
Record: 1 of 3

Datasheet View

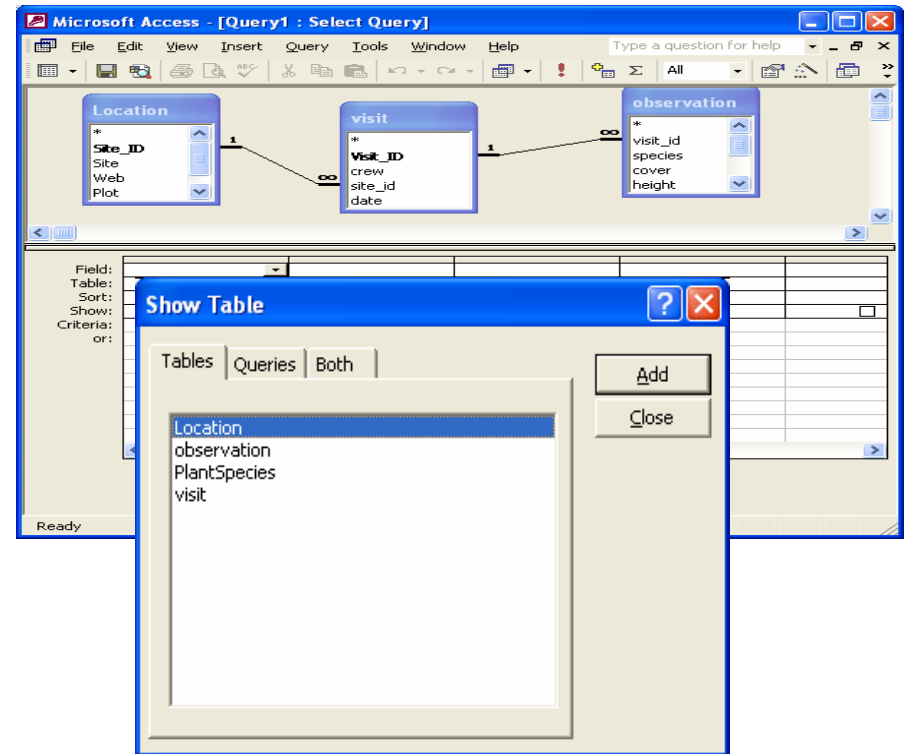
- Open the Location table and expand the table to show linked data by clicking on the '+'



# Create a query to show all the data at once



- Choose Query from the database objects list
- Choose “Create query in Design View”

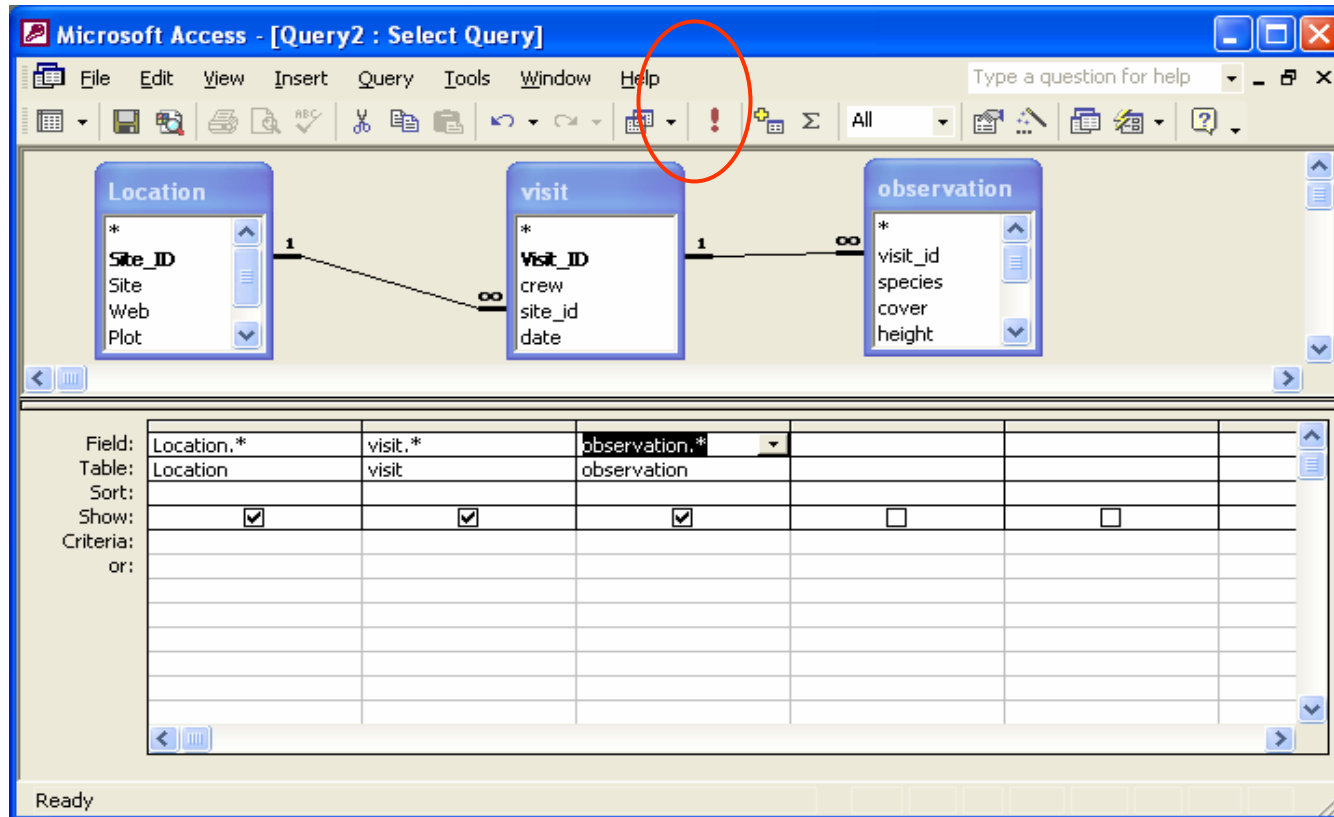


- Add the tables Location, Observation, and Visit to the query
- Close the ‘Show Table’ window





# Define the query



- Use the drop-down boxes to make your window look like this
- Click on the '!' to run your query







# Results of the query

Microsoft Access - [Query3 : Select Query]

Type a question for help

	Location	Site	Web	Plot	Quad	visit.visit_id	crew	visit.site_id	date	observation.visit_id	species	cover	height	observation_id	phenology	comments	observation_id
▶		2 CM	1 N		1	2	karen	2	6/24/2005	2	boer4	1	23	1	fl	oryx track	1
		2 CM	1 N		1	2	karen	2	6/24/2005	2	bogr2	1	12	2	fl		2
		2 CM	1 N		1	2	karen	2	6/24/2005	2	asmim	3	12	16	fr		3
*	AutoNumber)					AutoNumber)											

Record: 1 of 3

Datasheet View

- Now you have an Excel-like format that can be exported.

