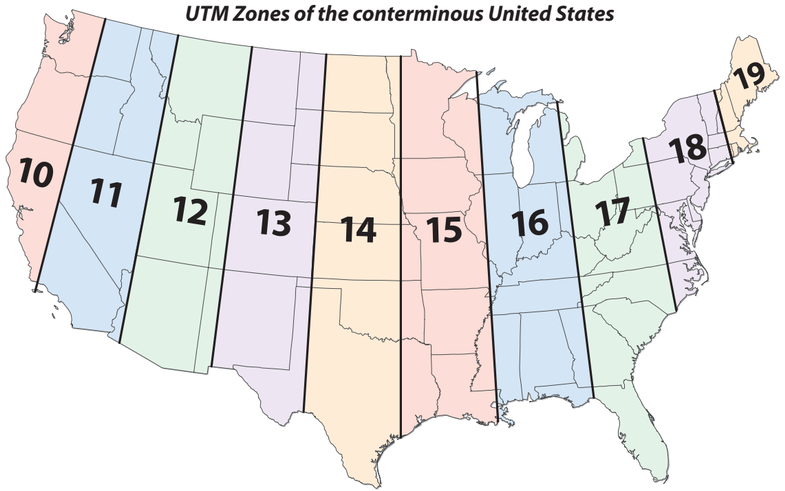
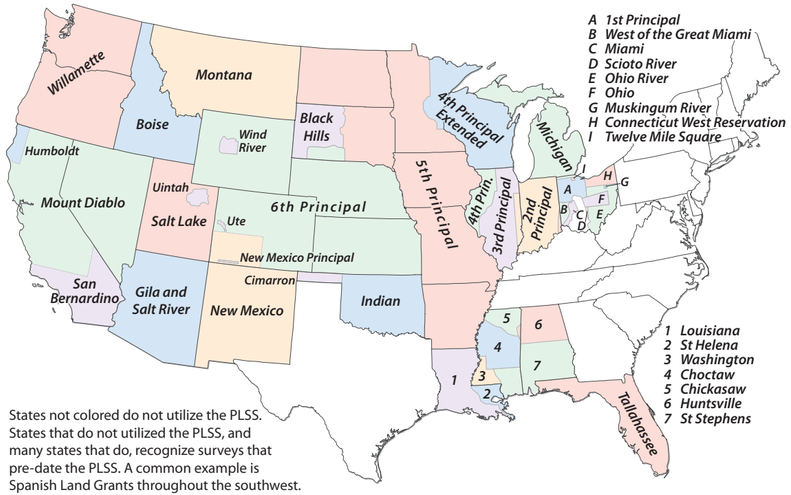
Common Map Scales and Equivalents

Map Scale	Architectural/ Engineering Scale	Scale	Examples
1:1,000	1 in ≈ 83 ft		
1:1,200	1 in = 100 ft		Site Plan, Plan and Profiles
1:2,400	1 in = 200 ft		Parcel Data
1:5,000	1 in ≈ 417 ft		
1:6,000	1 in = 500 ft		Parcel Data
1:12,000	1 in = 1,000 ft	Large Scale	
1:24,000	1 in = 2,000 ft		USGS 7.5-minute series topographic maps
1:25,000	1 in ≈ 2,083 ft		USGS 7.5 x 15-minute series topographic maps
1:31,680	1 in = ½ mi		
1:50,000	1 in ≈ 0.79 mi	Medium Scale	USGS County maps & DMA map series
1:62,500	1 in ≈ 0.99 mi		USGS 15-minute topographic maps
1:63,360	1 in = 1 mi		USGS 15-minute Alaska series maps
1:100,000	1 in ≈ 1.58 mi		USGS & BLM 30 x 60-minute maps & USGS County maps
1:250,000	1 in ≈ 3.95 mi	Small Scale	USGS 1 x 2-degree topographic maps
1:500,000	1 in ≈ 7.89 mi		USGS State Maps
1:1,000,000	1 in ≈ 15.78 mi		USGS State Maps

UTM Zones of the conterminous United States

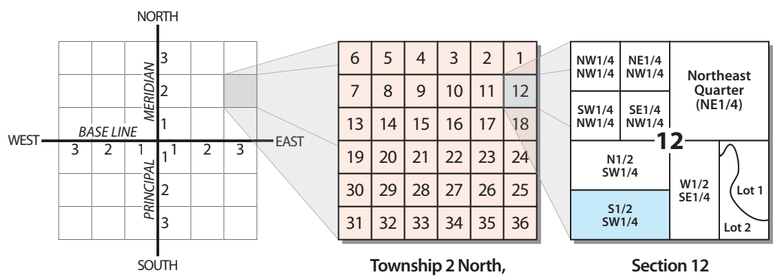


U.S. Public Land Survey System (PLSS) Meridians of the conterminous United States



States not colored do not utilize the PLSS. States that do not utilized the PLSS, and many states that do, recognize surveys that pre-date the PLSS. A common example is Spanish Land Grants throughout the southwest.

Example of subdivision and numbers systems in the U.S. Public Land Survey System (PLSS)



Township Grid

Township 2 North, Range 3 East

Section 12

Parcel Description:
S1/2 SW1/4 of Section 12, Township 2 North, Range 3 East of the 6th Principal meridian

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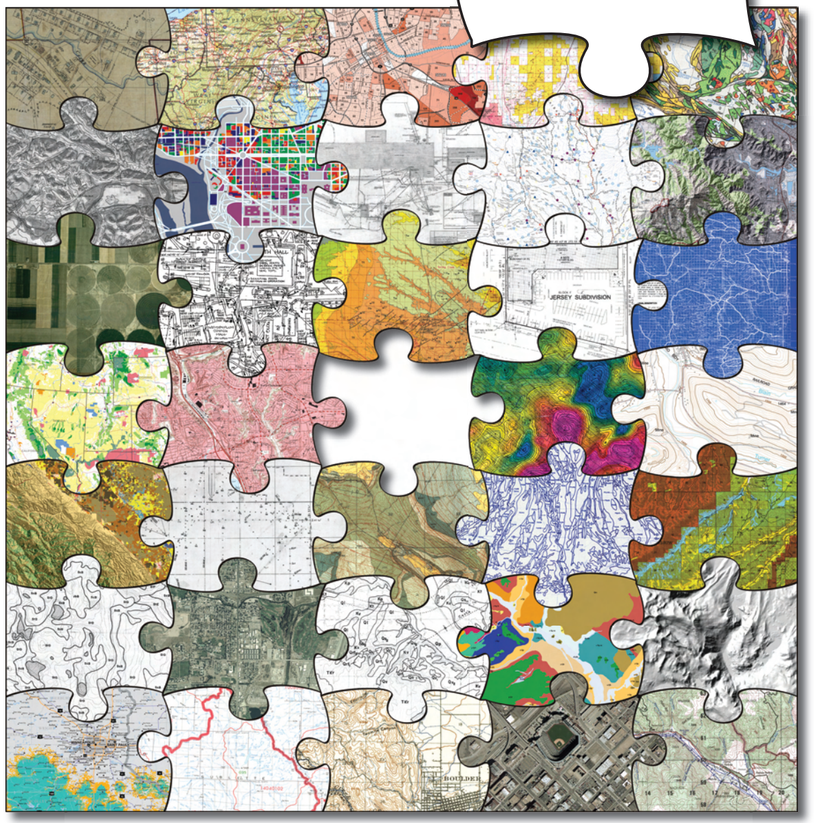
ArcGIS Quick Reference Card



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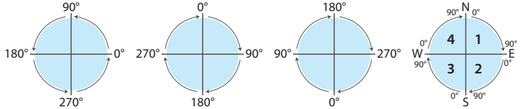
Common Editing Keyboard Shortcuts

F6	Absolute X,Y	R	Radius
A	Angle	F	Scale Factor
CTRL + F	Deflection	F7	Segment Deflection
CTRL + DEL	Delete Sketch	CTRL + F5	Snap to Endpoint
CTRL + D	Delta X,Y	CTRL + F6	Snap to Vertex
CTRL + A	Direction	CTRL + F7	Snap to Midpoint
CTRL + G	Direction/Length	CTRL + F8	Snap to Edge
D	Distance	F8	Streaming
F2	Finish Sketch	Space Bar	Suspend Snapping
CTRL + L	Length	CTRL + Z	Undo
C	Pan	Z	Zoom In
CTRL + P	Parallel	X	Zoom Out
CTRL + E	Perpendicular		

Changing Direction Systems and Units

ArcMap supports the following four direction systems for constructing features using the edit tools:

Polar *(Default)* **North Azimuth** **South Azimuth** **Quadrant Bearing**



*To change the direction system and/or unit, select **Options** from the **Editor Toolbar**, then select the **Units** tab.*

The direction system units can utilize five unit systems: decimal degrees (default), degrees/minutes/seconds (DMS), radians, gradians, and gons.

Polar & Azimuth Formats

Format	Example
dd.dddd (default)	40.6042944
dd-mm-ss.ss	40-36-15.46
dd.mmssss	40.361546
dd^mm'ss.ss"	40^36'15.46"

Quadrant Bearing Formats

Format	Example
[NS] dd.dddd [EW]	N 40.6042944 W
dd.dddd-[1234]	40.6042944-4

NOTE: Quadrant bearings can use any of the polar or azimuth formats to the left instead of the default (dd.dddd).

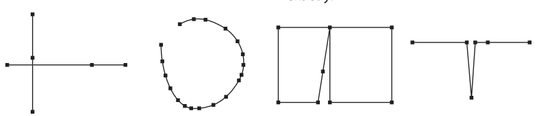
Common Geometry Errors

Dangle
A dangle is a line that does not end at its true point of termination.

Gap
The distance between vertices that should be closed.

Sliver
An area formed between two polygons which do not match exactly.

Spike
An errant data point protruding from an inter-polated surface.



Common Unit Conversions

Linear Conversions

1 foot	12 inches
1 foot	0.304801 meter
1 meter	3.28083 feet
1 mile	63,360 inches
1 mile	5,280 feet
1 mile	1,609.344 meters

Area Conversions

1 foot^2	0.092003 meters^2
1 meter^2	10.76391 feet^2
1 acre	43,560 feet^2
1 acre	4,046.856 meters^2
1 hectare	107,639.1 feet^2
1 hectare	10,000 meters^2
1 mile^2	640 acres
1 mile^2	2,589,988.11 meters^2
1 mile^2	27,878,400 feet^2

Optional Distance Units

When creating or editing features in ArcMap you can enter the following distance units instead of the units of the target dataset.

Abbr	Distance Unit
cm	Centimeter
ch	Chain
chUS	Chain, Survey
ft	Foot
ftUS	Foot, Survey
in	inch
km	Kilometer
lk	Link
lkUS	Link, Survey
m	Meter
mi	Mile
nm	Mile, Nautical
miUS	Mile, Survey
mm	Millimeter
rd	Rod
rdUS	Rod, Survey
yd	Yard
ydUS	Yard, Survey

General ArcGIS Tips

File and Folder Naming Conventions
It is still best practice not to use uppercase letters or spaces in folder or file names for GIS data files. Though they might work in some case, they will cause problems in ArcToolbox commands.

ArcGIS (ArcMap/ArcCatalog) is Crashing
Sometimes ArcMap, and/or ArcCatalog, will start crashing. This can be a result of several different issues. To fix this, try:

1. Quit all applications and reboot your computer. Take a 5-minute break, then try again.
2. Quit ArcMap and ArcCatalog. Move the **ESRI** folder in C:\Documents and Settings\User Name\ Application Data\ to your Desktop. Restart ArcMap. This should fix the majority of the crashing issues.
3. If it continues to crash on a specific MXD, try others. If they work, your MXD is corrupt. If no MXDs work, you will then need to look at reinstalling ArcGIS.

ArcMap Tips

Table of Contents Disappeared
Click on the **Window** menu, select **Table of Contents**

Saving MXD files
It is recommended to use **Save As...** to save MXD files, especially complex ones, rather than **Save**. MXD files are known to corrupt and saving maintains past versions.

Extensions
To activate an extension, click on the **Tools** menu, select **Extensions**. Check the box next to the extension you want to enable.

Static versus Relative Paths
ArcMap, by default, stores all layer paths as static paths. To change between static and relative paths, click on the **File** menu, select **Map Properties...**, and click **Data Source Options....**

Measurement Units Don't Work
This is usually due to a shapefile not having a projection assigned (.PRJ), the current projection is inappropriate, or there is a problem with the data file.

New Layer Visibility
Sometimes when adding data to ArcMap, you will not want to display it immediately, especially large datasets. You can change the Visibility options, by selecting the **Tools** menu, and clicking **Options**. Choose the **General** tab and uncheck **New Layer Visibility**.

Group/Ungroup Layers
To group layers, select the layers in the **Table of Contents** by shift or control click the layers and then right-click and select **Group**. To ungroup, select the group, right-click and select **Ungroup**.

Eliminate Unwanted Table Fields
To eliminate unwanted fields in a table, right-click the layer and select **Properties** > **Fields**. Uncheck all the fields you do not want to display. You can also use this as a multi-field delete by then right-clicking on the layer and selecting **Export Data**.

ArcToolbox Tools Won't Work
Make sure that you do not have spaces in the file or folder names. It is best practice to save files to C:\Temp or C:\Workspace when working with ArcToolbox and ModelBuilder.

Adding Transparent Legend Items
Transparencies cannot be displayed in a legend, however, you can add a tool in ArcMap that will give you the values of the transparent layer. To add the **Eye Dropper**, click on the **Tools** menu, and select **Customize**. Go to the **Command** tab, select **Page Layout** from the **Categories**, and scroll down in **Commands** until you see the Eye Dropper. Drag the **Eye Dropper** onto a toolbar. You can now use the **Eye Dropper** to select and display the color of the transparency.

Editing in Layout View
You can edit your data frame in Layout View, click the Data Frame Focus button or double-click the Data Frame.

ArcCatalog Tips

Catalog Tree Disappeared
Click on the **Window** menu, select **Catalog Tree**

"In Use By Another Application/User" Error
To deal with locked or "in use" files, download and install the freeware Unlocker (http://ccollomb.free.fr/unlocker/) or exit ArcCatalog and possibly ArcMap, and try again.

Import ArcInfo interchange (.E00) Files
Click on the **View** menu, select **Toolbars** > **ArcView 8x Tools**

Fixing Broken Data Sources
In ArcGIS 9, you can fix broken links in MXD files by selecting the MXD file in ArcCatalog, right-click and select **Set Data Source(s)...**

ArcToolbox

Tool	ArcToolbox Path
Append	Data Management > General
Buffer	Analysis > Proximity
Build Pyramids	Raster
Clip, Feature	Analysis > Extract
Clip, Raster	Raster
Define Projection	Projections & Transformations
Dissolve	Data Management > Generalization
Feature to Feature	Conversion > To Geodatabase
Intersect	Analysis > Overlay
Merge	Data Management > General
Mosiac	Raster
Multi-Single Part	Data Management > Features
Project	Projections & Transformations > Feature
Select	Analysis > Extract
Union	Analysis > Overlay

Common Data Types Supported by ArcGIS

Data Type	Range	Description
Short Integer	± 32,768	Short integers are whole numbers, positive or negative, that are typically used for coding. They are used for lists of short values such as land-use codes, vegetation types, and booleans (i.e., true/false).
Long Integer	± 2.14 billion	Long integers are whole numbers, either positive or negative, that are typically used to store quantity values such as population figures.
Float	± 3.4 x $10^{1.038}$	Floats are single-precision numbers that can support numbers with an accuracy to 6 places past the decimal. Floats are used to store simple decimal numbers such as percentages.
Double	± 1.8 x $10^{10,308}$	Doubles are double-precision numbers that can support numbers with an accuracy to 15 places past the decimal. Doubles are used to store decimal numbers with a high level of detail such as latitude and longitude.
Date	Jan 1, 100 - Dec 31, 9999	Dates are stored in Coordinated Universal Time (UTC) format and are translated into the current day and time in the local time zone
Text	1 byte/character	The text data type stores any character string (names, abbreviations, alpha-numeric codes, and numeric codes that begin with 0 such as zip codes).

Precision

8,987.08385

Scale

Common VB Operators

Mathematical Operators	
+	Addition
-	Subtraction
*	Multiplication
/	Division
\	Integer Division
mod	Modulus
^	Exponent
String Operators	
&	Concatenation
vbCRLF	Carriage Return/Line Feed
vbNewLine	Line Feed
Comparison Operators	
>	Greater Than
<	Less Than
<>	Not Equal To
>=	Greater Than or Equal To
<=	Less Than or Equal To
=	Equal To

Common VB Functions

Function	Description
Data Type Conversion Functions	
CDate()	Returns a Data data type
CDbl()	Returns a Double data type
CInt()	Returns a Integer data type
CLng()	Returns a Long data type
CStr()	Returns a String data type
Mathematical Functions	
Abs()	Returns the absolute value of a given value
Exp()	Returns the base of a natural logarithm raised to a power
Rnd()	Returns a random number
String Functions	
Format()	Returns a string formatted to a given specification
InStr()	Returns the position of one string within another
LCase()	Returns a string converted to lowercase
Left()	Returns a string containing the leftmost n characters
Mid()	Returns a string containing a specified number of characters
Right()	Returns a string containing the rightmost n characters
Split()	Returns an array of values from a string and a separator
Trim()	Returns a string with both leading and trailing spaces removed
UCase()	Returns a string converted to uppercase
Date Functions	
Now()	Returns the current date and time
Date()	Returns the current date
DateAdd()	Adds or subtracts the number of the interval from the date
DateDiff()	Returns the number of intervals between two dates
DatePart()	Extracts an individual component of the date