

Lesson plan – Mapping our school – Worksheet

Introduction:

GPS (Global Positioning System) technology is part of everyday lives of an increasing proportion of European households. Apart from being inseparable part of navigation systems and other contemporary location based services, the use of GPS is essential for the collection of precise and timely information for a GIS.

The GPS technology consists of three interrelated segments - constellation of 24 satellites orbiting the Earth in 6 orbits; control segment of base stations and handheld GPS devices.

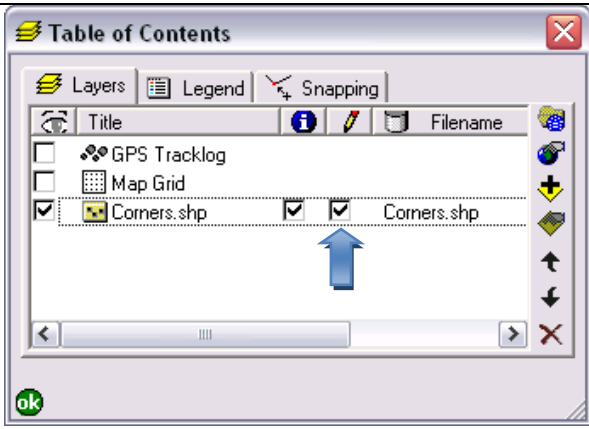
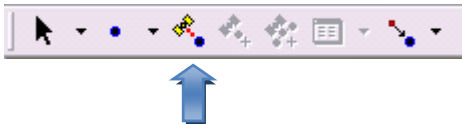
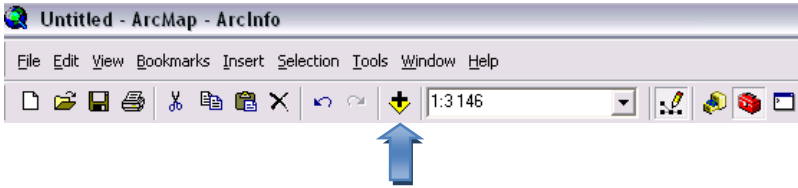
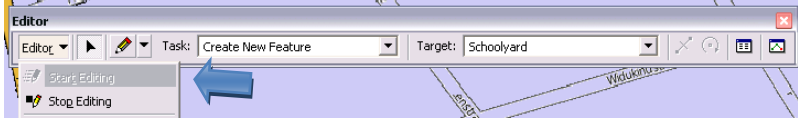
The abilities to use of GPS can ease the process of creation and manipulation of geographic data for virtually any application area. The necessary resources for collecting data include the need of a handheld device, to be used in the open air. All devices can be used to collect data for a GIS, but the widest use is within specific software products called mobile GIS.

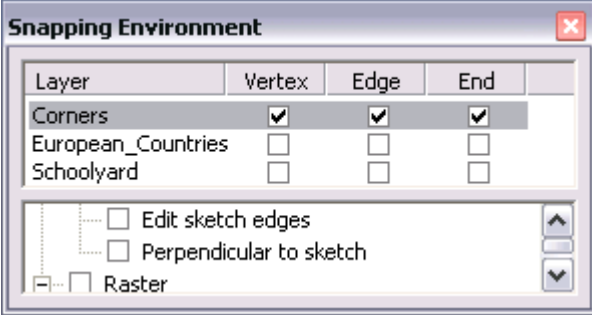
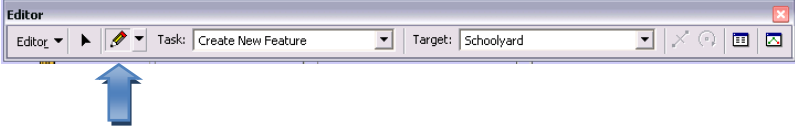
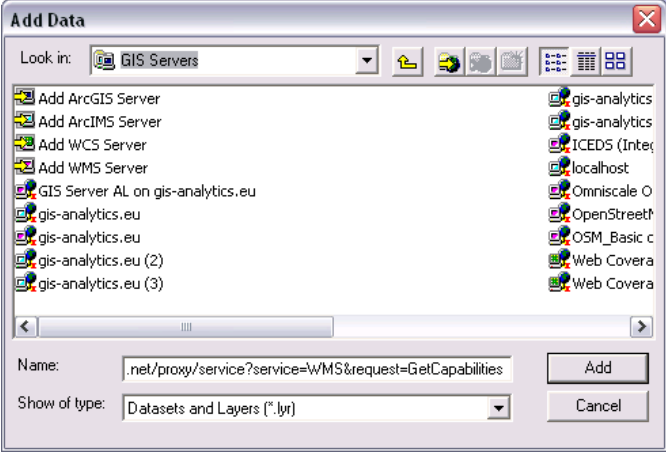
Description of the exercise:

The exercise addresses issues of field data collection through handheld GPS, and the consequent creation of geographical information in a computer laboratory. The necessary resources require the use of a handheld GPS on a PDA device with the ArcPad software for mobile data collection installed.

The aim of the exercise is to collect data for the school yard in the field and integrate it with other sources of information into a desktop GIS.

<i>number</i>	<i>instruction</i>	<i>iNotes</i>	<i>Teachers' / Trainers' activity</i>	<i>Pupils' / participants' activity</i>
1	Go outside to a place with as good a visibility of the horizon as possible			X
2	Start ArcPad and add the predefined project ourschoolyard.apm	1	<input type="checkbox"/>	X
	The data collection during the exercise will require the creation of separate point features representing all of the corners of the school yard. In order to do so it is necessary to consequently visit all of them with the GPS of the device activated. A point layer with a fixed attribute structure is already created and available for the exercise.			
3	Start the GPS and wait for the GPS signal to be acquired (approx. 3-5 minutes)		<input type="checkbox"/>	X
4	You need to make the point layer editable by clicking the "Table of Contents" and the editable layer checkbox:		<input type="checkbox"/>	X

				
5	<p>Once there is GPS signal you can start creating point features by visiting the corners of the school yard and pressing the capture point tool:</p> 		□	X
<p>Now that you have collected the points representing the corners of the school yard you can proceed with creating a polygon, representing the yard in the GIS computer laboratory</p>				
6	<p>Download the data from the handheld mobile GIS device and copy the entire folder, containing the data - "Mapping_our_school" to the hard drive.</p>		□	X
7	<p>Start ArcMap and add the layers "Corners" and "Schoolyard" to the program. The "Schoolyard" layer is already created for you and has polygon geometry.</p>		□	X
9	<p>Activate the Editor toolbar</p> 	12	□	X
10	<p>Start editing the empty polygon layer by choosing Editor → Start editing.</p>  <p>Make sure that the layer "Schoolyard" is set as target layer, and not one of the other layers which are added in ArcMap.</p>	12	□	X
<p>In order to create the data for the school yard you need to create the polygon by snapping its edges to the points collected through the mobile GIS device. This is achieved in ArcMap through the Editor toolbar.</p>				
11	<p>Select "Snapping" from the edit menu and choose to snap the polygon feature to the points, created with the GPS device (Corners.shp)</p>		□	X

				
<p>12</p>	<p>Now that you have done all the required settings you can start creating the polygon, representing the school yard. This is done by choosing the Sketch tool and creating the polygon by consequently clicking all of its corners.</p>  <p>Make sure to save your edits from the Editor menu and then stop editing the polygon.</p>	<p>12</p>	<p><input type="checkbox"/></p>	<p>X</p>
<p>You can now integrate the newly created data with other sources of information about the same territory. In order to verify the collected information you can add a layer representing the surrounding streets from an internet source - Omniscale OpenStreetMap WMS Proxy on osm.omniscale.net</p>				
<p>13</p>	<p>Choose the Add Data button and select “GIS Servers”</p> 	<p>44</p>	<p><input type="checkbox"/></p>	<p>X</p>
<p>14</p>	<p>Select the Add WMS Server option and paste the following line in the address bar: http://osm.Omniscale.net/proxy/service?service=WMS&request=GetCapabilities This will add the streets of the entire Germany, Austria, Switzerland, the Netherlands, Belgium and Luxembourg. Everything should be in line with the newly created data.</p>	<p>44</p>	<p><input type="checkbox"/></p>	<p>X</p>

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15	Export your map as <i>mappingourschoolyourname.pdf</i> and save it in your portfolio on Moodle.	42	<input type="checkbox"/>	X
<p>Congratulations! You are now ready to collect geographic data with a mobile GIS. Enjoy!</p>				

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