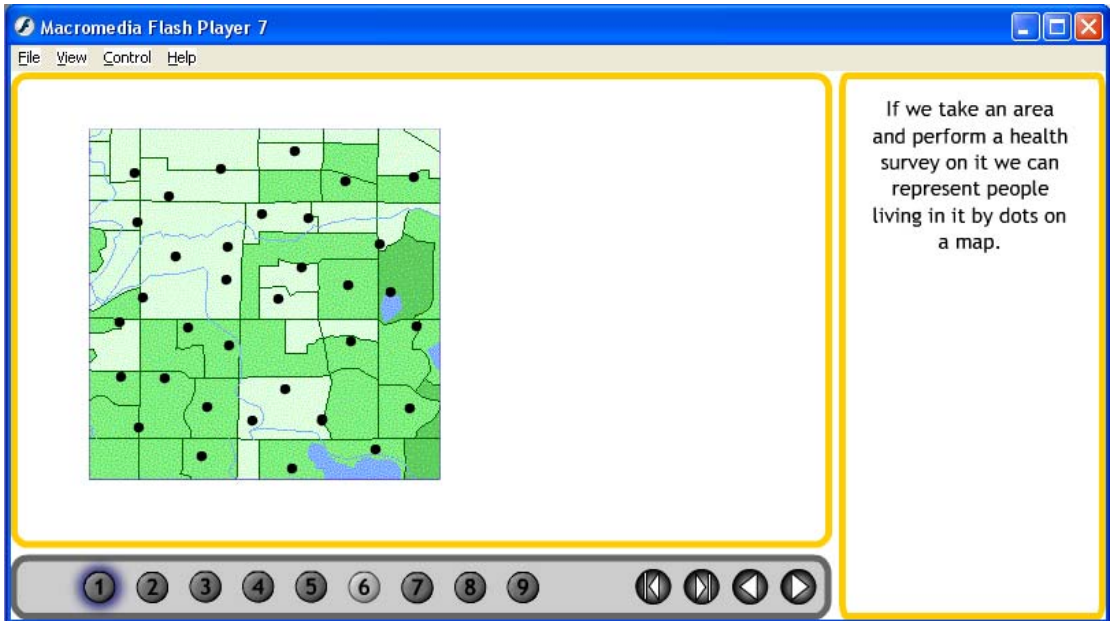
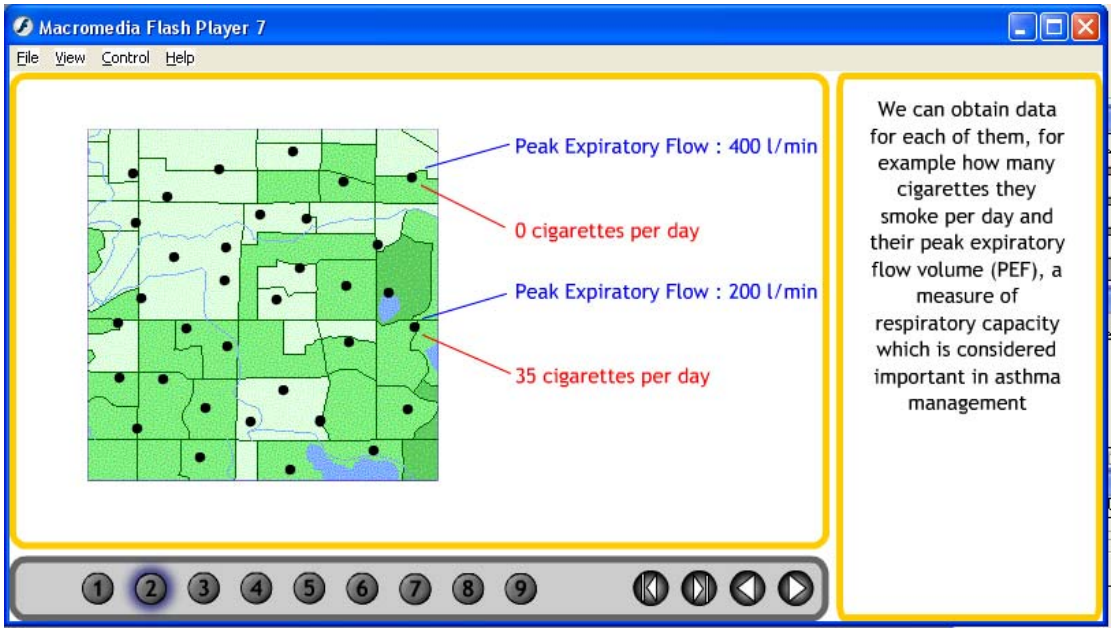
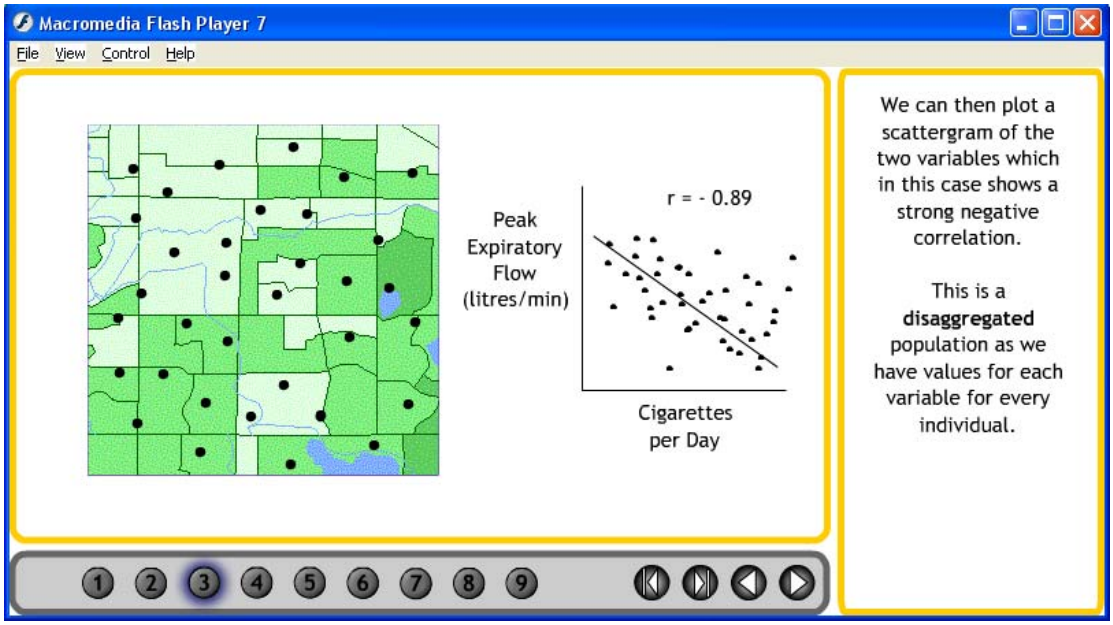
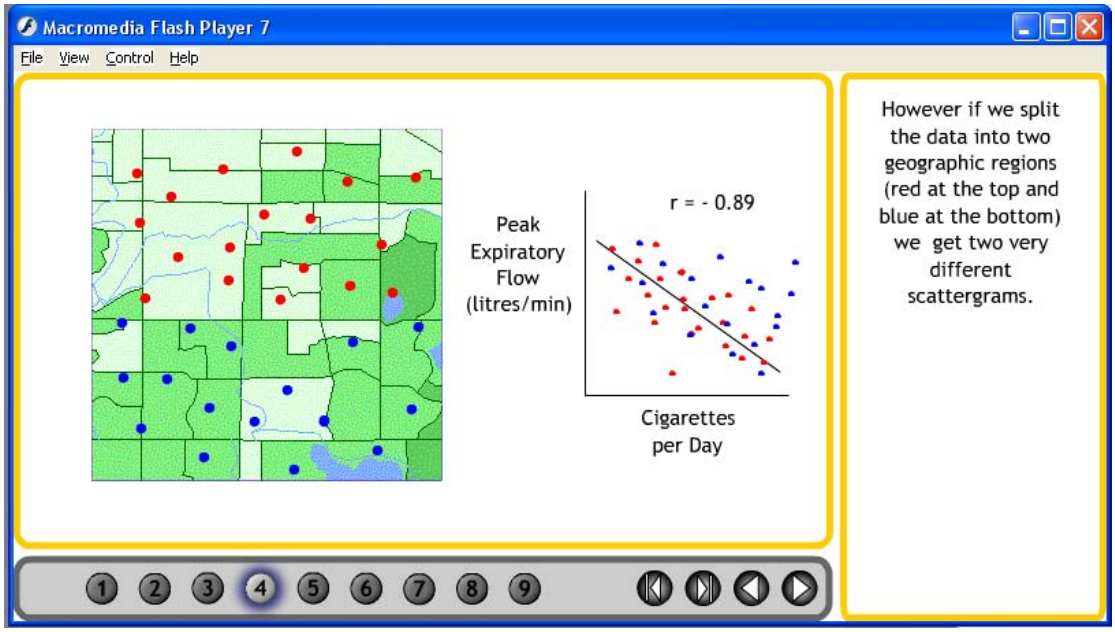
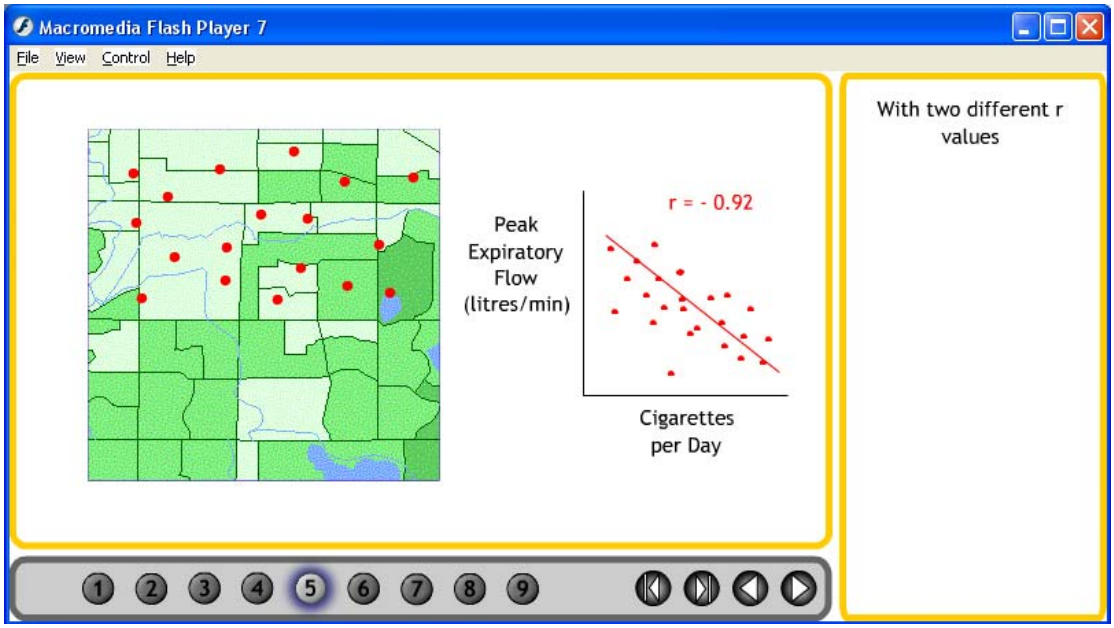
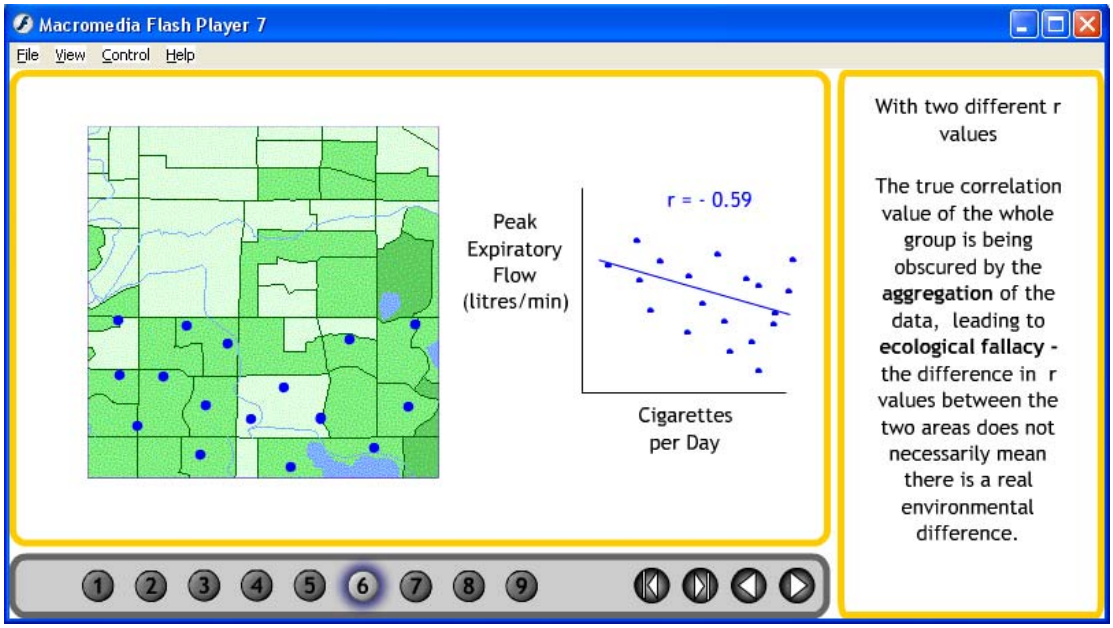

Macromedia Flash Player 7
File View Control Help
If we take an area and perform a health survey on it we can represent people living in it by dots on a map.
1 2 3 4 5 6 7 8 9

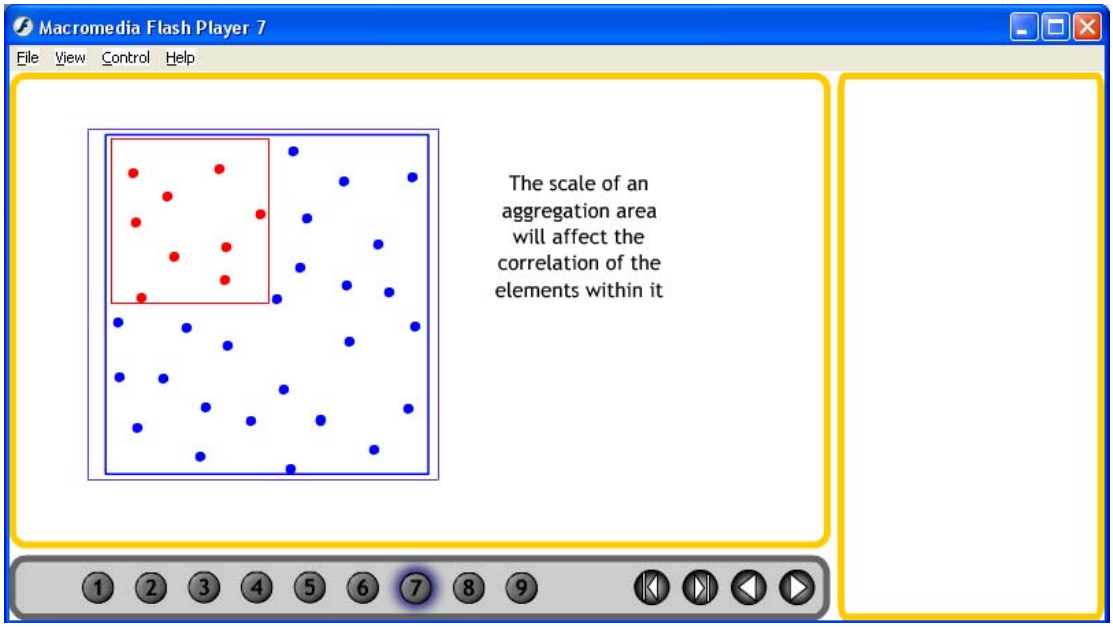

Macromedia Flash Player 7
File View Control Help
Peak Expiratory Flow : 400 l/min
0 cigarettes per day
Peak Expiratory Flow : 200 l/min
35 cigarettes per day
We can obtain data for each of them, for example how many cigarettes they smoke per day and their peak expiratory flow volume (PEF), a measure of respiratory capacity which is considered important in asthma management
1 2 3 4 5 6 7 8 9

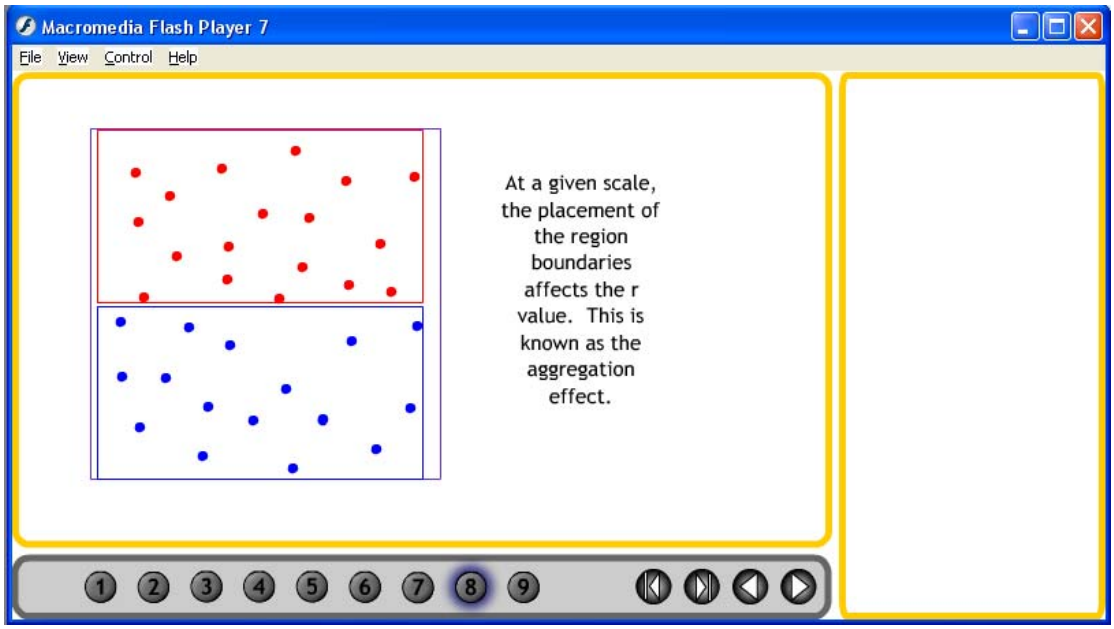

Macromedia Flash Player 7
File View Control Help
Peak Expiratory Flow (litres/min)
r = - 0.89
Cigarettes per Day
We can then plot a scattergram of the two variables which in this case shows a strong negative correlation.
This is a **disaggregated** population as we have values for each variable for every individual.
1 2 3 4 5 6 7 8 9

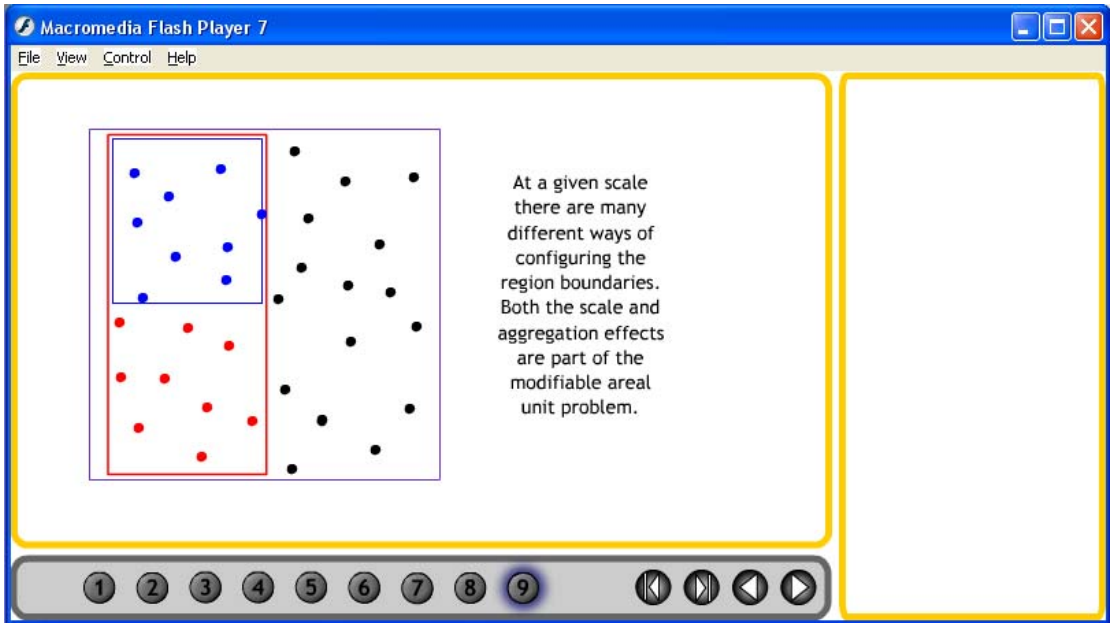

Macromedia Flash Player 7
File View Control Help
Peak Expiratory Flow (litres/min)
r = - 0.89
Cigarettes per Day
However if we split the data into two geographic regions (red at the top and blue at the bottom) we get two very different scattergrams.
1 2 3 4 5 6 7 8 9


Macromedia Flash Player 7
File View Control Help
Peak Expiratory Flow (litres/min)
r = - 0.92
Cigarettes per Day
With two different r values
1 2 3 4 5 6 7 8 9


Macromedia Flash Player 7
File View Control Help
Peak Expiratory Flow (litres/min)
r = - 0.59
Cigarettes per Day
With two different r values
The true correlation value of the whole group is being obscured by the aggregation of the data, leading to ecological fallacy - the difference in r values between the two areas does not necessarily mean there is a real environmental difference.
1 2 3 4 5 6 7 8 9


Macromedia Flash Player 7
File View Control Help
The scale of an aggregation area will affect the correlation of the elements within it
1 2 3 4 5 6 7 8 9


Macromedia Flash Player 7
File View Control Help
At a given scale, the placement of the region boundaries affects the r value. This is known as the aggregation effect.
1 2 3 4 5 6 7 8 9


Macromedia Flash Player 7
File View Control Help
At a given scale there are many different ways of configuring the region boundaries. Both the scale and aggregation effects are part of the modifiable areal unit problem.
1 2 3 4 5 6 7 8 9