Elections to the Northern Ireland Assembly
The Single Transferable Vote System

At the polling station

Voters in each constituency vote for as many candidates as they wish in order of preference.
Each voting paper is checked to see if it has been correctly filled in. Those that are not (spoilt papers) are removed from the count to give the number of valid votes.

At the count

A quota of votes is calculated for each constituency. This is the number of votes needed by a candidate to get elected. The quota is calculated using the formula below:

$$\text{Quota} = \left\{ \frac{\text{Total number of valid votes cast in constituency (V)}}{\text{Number of seats (S)} + 1} \right\} + 1$$

In Northern Ireland all our constituencies are 6-member, i.e. the number of seats (S) is 6, this means the quota is 1/7th of the votes cast plus 1 vote.

Example: In the 2011 Assembly Election, 35,487 valid votes were cast in the constituency of Lagan Valley. The quota of votes required therefore for a member to be elected was 5,975.

$$\left\{ \frac{35487}{6 + 1} \right\} + 1 \ = \textbf{5070}$$

NB: The whole number is always used in calculating the quota. Should there be a fraction, the numbers after the decimal point are ignored. For example, in calculation above, 5069.5714 becomes 5069.

Activity 1: Calculating the Quota (number of votes a candidate needs to get elected)
Using the Total Valid Vote figures given below, calculate the quotas for the following constituencies in the 2011 Northern Ireland Assembly Election.

	Valid Vote	Quota
a) Belfast North	33,470	
b) East Antrim	29,023	

	Valid Vote	Quota
c) Foyle	38,847	
d) Upper Bann	42,362	

How are votes counted and preferences transferred?

Voting papers are sorted into bundles according to first preferences and counted. Any candidate reaching or exceeding the quota is elected. If they are elected with more 1st preference votes than the quota, their extra votes are called a surplus.

The Surplus

Surplus votes from candidates who exceed the quota are transferred to the remaining candidates who were chosen as number 2 (second preference) on the elected candidate/s' ballot papers (which show a second preference). All votes are transferred at a fractional value.

The surplus is calculated as follows:

> Surplus = Number of valid votes received – Quota

Example: The quota in constituency X is 4500 votes and candidate A received 5000 votes.
Surplus = 5000 – 4500. Therefore, candidate A has a surplus of 500.

Activity 2: Calculating the Surplus (number of votes a candidate has received over the quota)

Calculate the surplus for each of the following candidates at the first stage of the count.

	Candidate's Vote	Quota	Surplus			Candidate's Vote	Quota	Surplus
a	11210	5655		c		6100	5650	
b	12580	6970		d		8195	5330	

Which papers are transferred?

Candidate A was selected at the first count, having exceeded the quota. It would not be a fair system to transfer the just candidate A's 500 surplus papers to the other candidates. If only the 'extra' papers were transferred there would be no way of ensuring that the 2nd preferences on these 500 papers were representative of all the 5000 ballot papers that candidate A had received: 4,500 people would not have their second preferences considered. For fairness, all the candidate's ballot papers with a 2nd choice are redistributed. These are called transferable ballotpapers as the voter has indicated a 2nd preference.

The transferable ballot papers are reallocated to the next choice candidates at a transfer value (a fractional percentage of one vote). This reduces the value of each vote transferred, so that the total redistributed vote is not worth more than the value of the candidate's surplus. So when we talk about transferring the surplus, we really mean transferring the value of the surplus (across all the transferable papers) rather than transferring the actual surplus papers.

That sounds complicated

If we take the example of candidate A again, if all their papers have a 2nd preference then there are 5000 transferable papers to be reallocated. This will be at a total transfer value of their surplus – 500. So 5000 papers transferred to equal a total value of 500 means that each ballot paper has an individual transfer value of 0.10. 500/5000 = 1/10 = 0.10

How is this transfer value calculated?

$$\text{Transfer value} = \frac{\text{Surplus}}{\text{Total number of transferable ballot papers for candidate}}$$

Example: Candidate B receives 1000 votes. The quota in their constituency is 900. This means they have a surplus of 100 (1000–900). The transfer value is calculated by dividing the surplus (100) by the total number of transferable ballot papers. If all 1000 ballot papers Candidate B received were transferable, that would be 100/1000 = 1/10th or 0.10 of a vote (2 decimal places). So in this example the 1000 ballot papers would be re-distributed to the next available preferences at the value of 1/10th of a vote.

Activity 3: Calculating the Transfer Value

Using the figures from Activity 2 and assuming all papers are transferable, calculate the transfer value for each of the candidates at the first stage of the count.

	Candidate's Vote	Quota	Surplus	Transfer Value
a	11210	5655	5555	
b	12580	6970	5610	
c	6100	5650	450	
d	8195	5330	2865	

What happens if no one reaches the quota in the first count?

If no candidate reaches the quota when the 1st preferences votes have been counted, the candidate with the lowest number of 1st preferences is eliminated.

Their next available preferences are redistributed to the candidates left. The transfer value of each transferable paper is still 1 vote, as the 1st preference was not used.

What happens after the first count?

The second count adds the first preference votes for the candidates not selected in the first count with the second preferences transferred to them.

Again, if a candidate reaches the quota at this stage they are elected and any surplus over the quota is redistributed at transfer value according to the next available preferences.

This process is repeated until all 6 seats have been filled. If no one reaches the quota in a particular stage of the count, the candidate with the lowest vote is eliminated and their votes redistributed to the next preference candidate.
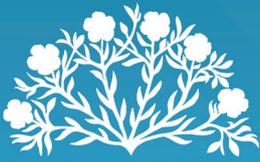
How many counts are there?

There will be as many counts as are needed to fill all 6 seats. The first 6 candidates to reach or come closest to reaching the quota will be successful.

Activity 4: Revision

Using the information given, identify which of the following candidates were deemed elected in the first count in the 2011 Assembly Election.

Constituency	Total Valid Vote	Candidate A	Candidate B	Candidate C	Candidate D	Candidate E
Belfast East	32347	9149	4329	4183	2436	2668
Fermanagh & South Tyrone	47999	5082	6876	9110	5146	4606
Mid Ulster	42738	5065	7127	4263	8957	5178
North Antrim	40313	4061	6083	6152	3275	6581
Newry & Armagh	446514	6614	7123	3825	830	8718

Calculate the surplus for each of the following candidates and the transfer value of each of their ballot papers at the first stage of the count, assuming all papers are transferable.

	Candidate's Vote	Quota	Surplus	Transfer Value
a	4844	4595		
b	4284	4239		
c	6390	4616		
d	5175	4015		
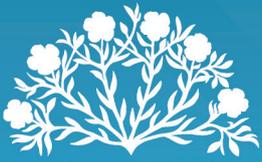
Additional Information

For analysis of the 2011 election, go to: www.niassembly.gov.uk/researchandlibrary/2011/5511.pdf

Results for individual constituencies can be accessed via the Membership (Constituency Map) section of the main Northern Ireland Assembly website at: www.niassembly.gov.uk

Further information on elections is available from the websites of the Electoral Commission and the Electoral Office:

www.electoralcommission.org/northernireland

www.eoni.org.uk