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How a candidate is elected for one vacancy

If there is only one position available (e.g. a mayoralty) and there are only two candidates, the election will always be decided on the first preference votes, in just the same way as a first-past-the-post election.

If there is only one position available, and more than two candidates, STV works like this:

Setting the quota (called an absolute majority)

The quota needed to get elected in an election for one vacancy is half the votes being counted (technically, half the votes, plus a fraction). The quota is recalculated whenever votes can't be transferred (for example because the vote expresses only one preference, and the voting has progressed to second preferences).

Deciding an outcome on the count of first preferences

If a candidate gets more than half the first preference votes, that candidate will be elected. Votes will not need to be transferred to second and later preferences to decide the outcome because a candidate has already reached the quota.

Deciding an outcome if no one wins on the count of first preferences

If there are more than two candidates for a single position, it may be necessary to go only to second-preference candidates to decide a winner. This is done by excluding the lowest-polling candidate and transferring the second-preference votes of those who supported that candidate to other candidates. After this is done, if the vote for one of the candidates is higher than the quota, that candidate is elected.

However, even after the second preferences of voters for the lowest-polling candidate are transferred, it may be that no candidate has reached the quota. If this is the case, the next lowest-polling candidate is excluded, and the second-preference votes for that candidate are transferred to those who have not been excluded. But some of those second-preference votes may be for the candidate who was excluded first. In this case, these votes are transferred to the third preferences of those voters.

This continues until a candidate reaches the quota. The computer system used ensures that the order in which votes are counted does not affect the outcome.

Equal votes

If, on any count, two or more candidates have an equal number of votes and one of them has to be excluded, the electoral officer determines which candidate had the fewest votes the first time the candidates' totals were different and excludes the candidate with the lowest total votes.

Ties

If the candidates had an equal number of votes at all stages of the count, a random (or pseudo-random) process is used to choose which candidate is excluded.

Example one – one position, two candidates, 10,000 votes

- 5,500 first preferences for candidate A
- 4,500 first preferences for candidate B
- The quota is 10,000 divided by $(1+1) = 5,000$
- The total first preference votes for candidate A of 5,500 is greater than the quota of 5,000 therefore:

Candidate A is elected. There is no need to include second preferences.



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Example two – one position, 4 candidates, 10,000 votes

- 5,250 first preferences for candidate A
- 3,500 first preferences for candidate B
- 750 first preferences for candidate C
- 500 first preferences for candidate D
- The quota is 10,000 divided by $(1+1) = 5,000$
- The total of first preference votes for candidate A of 5,250 is greater than the quota of 5,000 therefore:

Candidate A is elected. There is no need to include second preferences.

Example three – one position, 4 candidates, 10,000 votes

- 3,500 first preferences for candidate A
- 2,500 first preferences for candidate B
- 3,000 first preferences for candidate C
- 1,000 first preferences for candidate D
- The quota is 10,000 divided by $(1+1) = 5,000$
- No candidate's first preference votes are greater than the quota of 5,000 therefore
- The lowest polling candidate (D) is excluded and the second preferences of the 1000 voters who voted for that candidate are transferred to the 3 remaining candidates. This results in:
 - 4,000 first preferences and transferred votes for candidate A
 - 2,750 first preferences and transferred votes candidate B
 - 3,250 first preferences and transferred votes for candidate C
 - 0 votes for candidate D, as all votes for this candidate have been transferred to the other candidates
- No candidate's vote is greater than the quota of 5,000 therefore
- The next lowest polling candidate (B) is excluded and the second preferences of those who voted for that candidate are transferred to the 2 remaining candidates. Where the second preferences were for candidate D, who has already been excluded, votes are transferred to voters' third preferences. This results in:
 - 5,750 first preferences and transferred votes for candidate A
 - 0 for candidate B, as all votes for this candidate have been transferred to other candidates
 - 4,250 first preferences and transferred votes for candidate C
 - 0 votes for candidate D, as all votes for this candidate have been transferred to other candidates
- The 5,750 votes for candidate A is more than the quota of 5,000, therefore:

Candidate A is elected.

NOTE: For elections with more than four candidates for a single position, the process continues in the same way until a candidate reaches the quota.



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How a candidate is elected for more than one vacancy

If there is more than one vacancy and more candidates than vacancies, STV works like this:

Setting the quota

The quota needed to get elected in an election where there is more than one vacancy, is the number of votes being counted divided by one more than the number of vacancies. For example, for an election where there are three vacancies and 1,000 votes, the quota is 1,000 divided by 4 ($3+1$) = 250.

The quota is recalculated whenever votes can't be transferred (for example because the vote expresses only one preference and the voting has progressed to second preferences).

Deciding an outcome on the count of first preferences

In an election with 1,000 votes for three vacancies, if three candidates get 250 or more first preference votes, those three candidates will be elected. Votes will not need to be transferred to second and later preferences to decide the outcome because enough candidates have already reached the quota.

Deciding an outcome if none or insufficient candidates win on the count of first preferences

If say two candidates reach the quota in an election for three vacancies, it may be necessary to go only to second-preference candidates to decide the other successful candidate. This is done first by transferring any surplus votes for the two candidates who reached the quota, to the second preference candidates of the voters who voted for those two candidates. If as a result a third candidate reaches the quota the election is complete.

Alternatively, if there are no surpluses to transfer, the candidate with the lowest number of first preferences is excluded and votes for that candidate are transferred to the second preferences of voters who voted for that candidate. If as a result a third candidate reaches the quota that candidate is elected and the election is completed.

However, it is more likely that even after the transfer of surpluses of elected candidates or transfers to second preference candidates following the exclusion of a candidate, insufficient candidates have reached the quota. If this is the case, the next lowest-polling candidate is excluded and the second-preference votes for that candidate are transferred to the other candidates. But some of those second-preference votes may be for the candidate who was excluded first. In this case, these votes are further transferred to the third or subsequent preferences of those voters.

On the other hand, some of the second-preference votes may be for the candidates who have already reached the quota. In this case the keep values for the elected candidates are recalculated and further transfers are made to voters' third and subsequent preferences.

This continues until sufficient candidates reach the quota. The computer system used ensures that the order in which votes are counted does not affect the outcome.

Equal votes

If, on any count, two or more candidates have an equal number of votes and one of them has to be excluded, the electoral officer determines which candidate had the fewest votes the first time the candidates' totals were different and excludes the candidate with the lowest total votes.

Ties

If the candidates had an equal number of votes at all stages of the count, a random (or pseudo-random) process is used to choose which candidate is excluded.



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Example one – 3 positions, 4 candidates, 20,000 votes

- 7,500 first preferences for candidate A
- 5,500 first preferences for candidate B
- 5,000 first preferences for candidate C
- 2,000 first preference for candidate D
- The quota is 20,000 divided by $(3+1) = 5,000$
- The totals of first preference votes for candidates A, B and C are greater than or equal to the quota of 5,000 and therefore:

Candidates A, B and C are elected. There is no need to include second preferences.

Example two - 3 positions, 4 candidates, 20,000 votes

- 8,000 first preferences for candidate A
- 6,500 first preferences for candidate B
- 4,000 first preferences for candidate C
- 1,500 first preferences for candidate D
- The quota is 20,000 divided by $(3+1) = 5,000$
- The totals of first preference votes for candidates A and B are greater than the quota of 5,000
- The surpluses of votes for candidates A and B are transferred according to the second preferences of the voters who voted for those two candidates. This results in:
 - 5,000 total votes retained by candidate A*
 - 5,000 total votes retained by candidate B*
 - 8,000 first preferences initially transferred votes for candidate C**
 - 2,000 first preferences and transferred votes for candidate D, and therefore:

Candidates A, B and C are elected.

* Candidate may have received further transferred votes but surpluses above the quota would have been transferred on to other candidates

**Normally the surplus votes for candidate C would be further transferred but in this case remain with that candidate as the computer counting program terminates once the required number of candidates are elected. Official results of elections are required to show candidates in the order they are elected and so candidate A would be shown as elected first, then candidate B followed by candidate C.

Example three - 3 positions, 8 candidates, 20,000 votes

- 4,750 first preferences for candidate A
- 3,500 first preferences for candidate B
- 3,250 first preferences for candidate C
- 3,000 first preferences for candidate D
- 2,500 first preferences for candidate E
- 1,750 first preferences for candidate F
- 1,000 first preferences for candidate G
- 250 first preferences for candidate H
- The quota is 20,000 divided by $(3+1) = 5,000$
- No candidate's vote is greater than or equal to the quota of 5,000 therefore
- The lowest polling candidate (H) is excluded and the votes for that candidate are transferred according to the second preferences of those who voted for that candidate. This results in:
 - 4,800 first preferences and transferred votes for candidate A
 - 3,540 first preferences and transferred votes for candidate B
 - 3,300 first preferences and transferred votes for candidate C
 - 3,020 first preferences and transferred votes for candidate D
 - 2,520 first preferences and transferred votes for candidate E
 - 1,760 first preferences and transferred votes for candidate F
 - 1,060 first preferences and transferred votes for candidate G



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- 0 votes for candidate H as all votes for this candidate have been transferred to other candidates
- Still no candidate's vote is greater than or equal to the quota of 5,000 therefore
- The next lowest polling candidate (G) is excluded and votes for that candidate are transferred according to the second or subsequent preferences of those who voted for that candidate. This results in:
 - 5,300 first preferences and transferred votes for candidate A
 - 3,800 first preferences and transferred votes for candidate B
 - 3,350 first preferences and transferred votes for candidate C
 - 3,100 first preferences and transferred votes for candidate D
 - 2,620 first preferences and transferred votes for candidate E
 - 1,830 first preferences and transferred votes for candidate F
 - 0 votes for candidate G as all votes for this candidate have been transferred to other candidates
 - 0 votes for candidate H as all votes for this candidate have been transferred to other candidates
- The 5,300 votes for candidate A is greater than the quota of 5,000 therefore this candidate is elected and 300 votes are available to be transferred to other candidates. This results in:
 - 5,000 votes retained by candidate A*
 - 4,000 first preferences and transferred votes for candidate B
 - 3,400 first preferences and transferred votes for candidate C
 - 3,150 first preferences and transferred votes for candidate D
 - 2,620 first preferences and transferred votes for candidate E
 - 1,830 first preferences and transferred votes for candidate F
 - 0 votes for candidate G as all votes for this candidate have been transferred to other candidates
 - 0 votes for candidate H as all votes for this candidate have been transferred to other candidates
- No further candidates have reached the quota therefore
- The next lowest polling candidate (F) is excluded and votes for that candidate are transferred according to the second or subsequent preferences of those who voted for that candidate. This results in:
 - 5,000 votes retained by candidate A*
 - 5,000 votes retained by candidate B*
 - 3,900 first preferences and transferred votes for candidate C
 - 3,450 first preferences and transferred votes for candidate D
 - 2,650 first preferences and transferred votes for candidate E
 - 0 votes for candidate F as all votes for this candidate have been transferred to other candidates
 - 0 votes for candidate G as all votes for this candidate have been transferred to other candidates
 - 0 votes for candidate H as all votes for this candidate have been transferred to other candidates
- A further candidate (B) has reached the quota but a third candidate is still required to be elected therefore
- The next lowest polling candidate (E) is excluded and the votes for that candidate are transferred according to the second or subsequent preferences of those who voted for that candidate. This results in:
 - 5,000 votes retained by candidate A*
 - 5,000 votes retained by candidate B*
 - 5,900 first preferences and initially transferred votes for candidate C**
 - 4,100 first preferences and transferred votes for candidate D and therefore:

Candidates A, B and C are elected.

* Candidate may have received further transferred votes but surpluses above the quota would have been transferred on to other candidates



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** Normally the surplus votes for candidate C would be further transferred but in this case remain with that candidate as the computer counting program terminates once the required number of candidates are elected. Official results of elections are required to show candidates in the order they are elected and so candidate A would be shown as elected first, then candidate B followed by candidate C.

