

Single Transferable Vote

Your Simulated Election Results



Objectives

- Illustrate how the Single Transferable Vote system works
- Show that features of Single Transferable Vote can be altered to produce different results

Design Features

- One 5 member district
- Not necessary to rank all candidates
- When transferring surplus votes all ballots are counted

Calculating the quota

- Calculate the Quota
 - Quota = $(\text{votes}/[\text{seats} + 1]) + 1$
 - STV always uses this formula to calculate the quota
 - Ignore decimals
- Your Quota:
- Quota = $(123/[5 + 1]) + 1$
- Quota = 21
- This means that all candidates who receive 21 votes will be elected

Counting 1st Preferences

- Count all first preferences on all ballots
- Anyone who reaches the quota will be elected

Your 1st Preference Results

Black Liquorice	9
Broccoli	7
Cantaloupe	11
Carrot Sticks	4
Chocolate Chip	27
Digestives	5
Dill Pickle	6

Honeydew Melon	10
Macaroons	4
Mixed Nuts	11
Oatmeal	14
Ripple	13
Scotch Mints	2

Quota = 21

Counting STV

- Each time someone passes the quota they are elected and the surplus votes are transferred
 - Transfer value must be recalculated each time
- If no one is elected the candidate with the fewest votes is eliminated

Transferring Surplus Votes

- Surplus votes of Chocolate Chip Cookies are transferred
- How do we transfer?
 - All ballots at a discounted rate
 - Why?

Calculating the Transfer Value

- Calculating the discounted rate (Transfer Value - TV)
- $TV = \frac{\text{Surplus votes for elected candidate}}{\text{Total votes for the elected candidate}}$

Calculating Your Transfer Value

- $TV = 6 \div 27$
- $TV = .222$

Transferring Surplus Votes

- Count all of the second preference votes on the ballots of the elected candidate (Chocolate Chip)

Transferring Your Surplus Votes

Oatmeal	13	Cantaloupe	2
Macaroons	3	Dill Pickle	2
Carrot Sticks	3	Mixed Nuts	1
Ripple	2	Black Liquorice	1

Second preferences on
Chocolate Chip's first
preference ballots

Transferring Surplus Votes

- Multiply these totals by the transfer value to determine how many surplus votes each candidate is entitled to
 - Ignore any decimals

Transferring Your Surplus Votes

- For Oatmeal Cookies:
 - $13 \times (.222) = 2.886$ surplus votes
- Oatmeal Cookies receives 2 surplus votes from Chocolate Chip cookies
- Do the same for the other candidates receiving 2nd preferences
- Add these totals to the original tally

Your STV Results

Black Liquorice	9
Broccoli	7
Cantaloupe	11
Carrot Sticks	4
Chocolate Chip*	21
Digestives	5
Dill Pickle	6

Honeydew Melon	10
Macaroons	4
Mixed Nuts	11
Oatmeal	16
Ripple	13
Scotch Mints	2

Quota = 21

* Elected

Counting STV

- Each time someone passes the quota they are elected and the surplus votes are transferred
 - Transfer value must be recalculated each time
- If no one is elected the candidate with the fewest votes is eliminated

Your STV Results

Black Liquorice	9
Broccoli	7
Cantaloupe	11
Carrot Sticks	4
Chocolate Chip*	21
Digestives	5
Dill Pickle	6

Honeydew Melon	10
Macaroons	4
Mixed Nuts	11
Oatmeal	16
Ripple	13
Scotch Mints	2

Quota = 21

* Elected

Eliminating the Last Place Candidate

- The votes for eliminated candidates are transferred to their next available preference at full value
 - Have not yet been used to elect anybody

Transferring Eliminated Candidate's Votes

Ripple	1
Digestives	1

Next preferences on
Scotch Mints' ballots

Your STV Results

Black Liquorice	9
Broccoli	7
Cantaloupe	11
Carrot Sticks	4
Chocolate Chip*	21
Digestives	6
Dill Pickle	6

Honeydew Melon	10
Macaroons	4
Mixed Nuts	11
Oatmeal	16
Ripple	14
Scotch Mints**	2

Quota = 21

* Elected ** Eliminated

Counting STV

- Each time someone passes the quota they are elected and the surplus votes are transferred
 - Transfer value must be recalculated each time
- If no one is elected the candidate with the most votes is eliminated

Your Final STV Results

Black Liquorice	10	Honeydew Melon	15
Broccoli	7	Macaroons	4
Cantaloupe	21	Mixed Nuts	21
Carrot Sticks	4	Oatmeal	21
Chocolate Chip	21	Ripple	21
Digestives	8	Scotch Mints	2
Dill Pickle	6	Quota = 21	

Your STV Results

Party	Seats
Candy	0
Chip	1
Cookie	2
Fruit	1
Veggie	0
Independents	1

Your STV Results

- 5 candidates were elected representing 3 different snack parties (one independent)
- This result required 11 counts
- 0 ballot were exhausted
 - Ballots that did not have enough preferences marked to be fully transferred

Variations

- Transfer method
- Different DMs
- Ranking method
- District magnitude
 - We will simulate the results produced by altering this variable
 - We will start by changing the DM to 3

Why Change the DM to 3?

- Allows for smaller geographic ridings
- Fewer candidates makes it easier to vote
- Easier to keep the legislature a small size
- Increases the likelihood of single-party majority governments
- Increases the strength of large parties, decreases the strength of small parties
- Tends to decrease proportionality

How to Vary the District Magnitude

The process is the same, all that changes is the number of candidates who are elected, and therefore the quota

- Quota = $(\text{votes}/[\text{Seats} + 1]) + 1$
- Ignore any decimal

- Your Quota:
- Quota = $(123/[3 + 1]) + 1$
- Quota = 31

Your Final STV Results (DM = 3)

Black Liquorice	10	Honeydew Melon	14
Broccoli	9	Macaroons	4
Cantaloupe	31	Mixed Nuts	31
Carrot Sticks	4	Oatmeal	30
Chocolate Chip	31	Ripple	20
Digestives	6	Scotch Mints	2
Dill Pickle	6	Quota = 31	

Your STV Results (DM = 3)

Party	Seats
Candy	0
Chip	0
Cookie	1
Fruit	1
Veggie	0
Independents	1

DM = 5 vs. DM = 3

- With a DM of 5 there were 11 counts required to reach the final result, with a DM of 3 there were 11 counts required
- With a DM of 5 there were 5 candidates elected from 3 different snack parties (one independent)
- With a DM of 3 there were 3 candidates elected from 2 different snack parties (one independent)

DM = 3

- Smaller geographic districts are possible
 - Tends to create less proportional results
 - Greater likelihood of single party majority government
 - Fewer parties (parliamentary and electoral)
 - Less voter choice
-
- What if we increased the DM to 7?

Why Change the DM to 7?

- Tends to increase proportionality
- Increases the likelihood of coalition governments
- Decreases the strength of large parties, increases the strength of small parties
- Creates larger geographic ridings
- More choice

How to Vary the DM

The process is the same, all that changes is the number of candidates who are elected, and therefore the quota

- Quota = (votes/[Seats + 1]) + 1
- Ignore any decimals

- Your Quota:
- Quota = (123/[7 + 1]) + 1
- Quota = 16

Your Final STV Results (DM = 7)

Black Liquorice	16	Honeydew Melon	16
Broccoli	9	Macaroons	6
Cantaloupe	16	Mixed Nuts	16
Carrot Sticks	5	Oatmeal	16
Chocolate Chip	16	Ripple	16
Digestives	11	Scotch Mints	2
Dill Pickle	7	Quota = 16	

Your STV Results DM = 7

Party	Seats
Candy	1
Chip	1
Cookie	2
Fruit	2
Veggie	0
Independents	1

DM = 5 vs. DM = 7

- With a DM of 5 there 11 counts required to reach the final result, with a DM of 3 required there were 11 counts required, with a DM of 7 there were 12 counts required
- With a DM of 5 there were 5 candidates elected from 3 different snack parties (one independent)
- With a DM of 3 there were 3 candidates elected from 2 different snack parties (one independent)
- With a DM of 7 there were 7 candidates elected from 4 different snack parties, (one independent)

DM = 7

- Larger geographic districts are likely
- Greater likelihood of coalition majority government
- More parties (parliamentary and electoral)
- More candidates means more choice
- Tends to produce more proportional results

Conclusion

- Changing the district magnitude in STV impacts upon the number of parties and the amount of local representation
- You can have local representation and more parties if you increase the size of the legislature