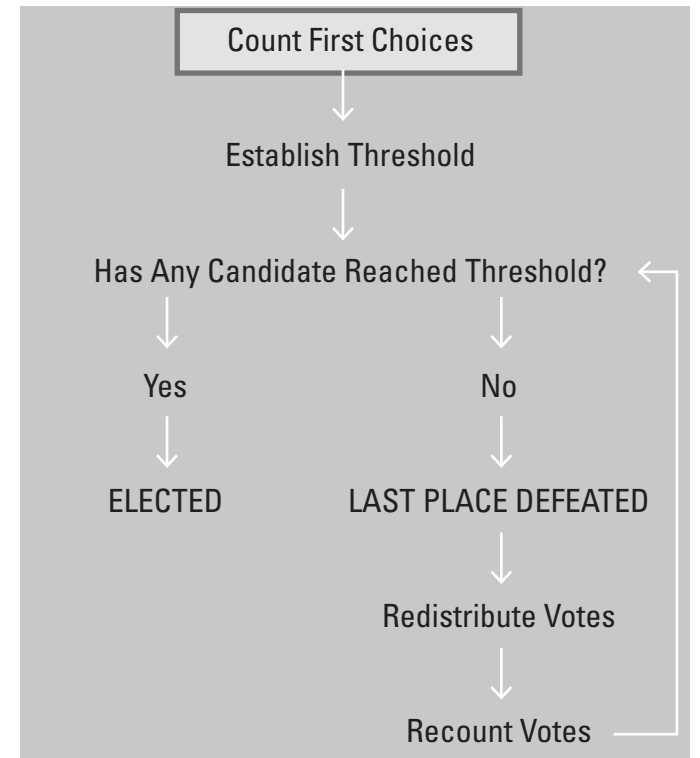
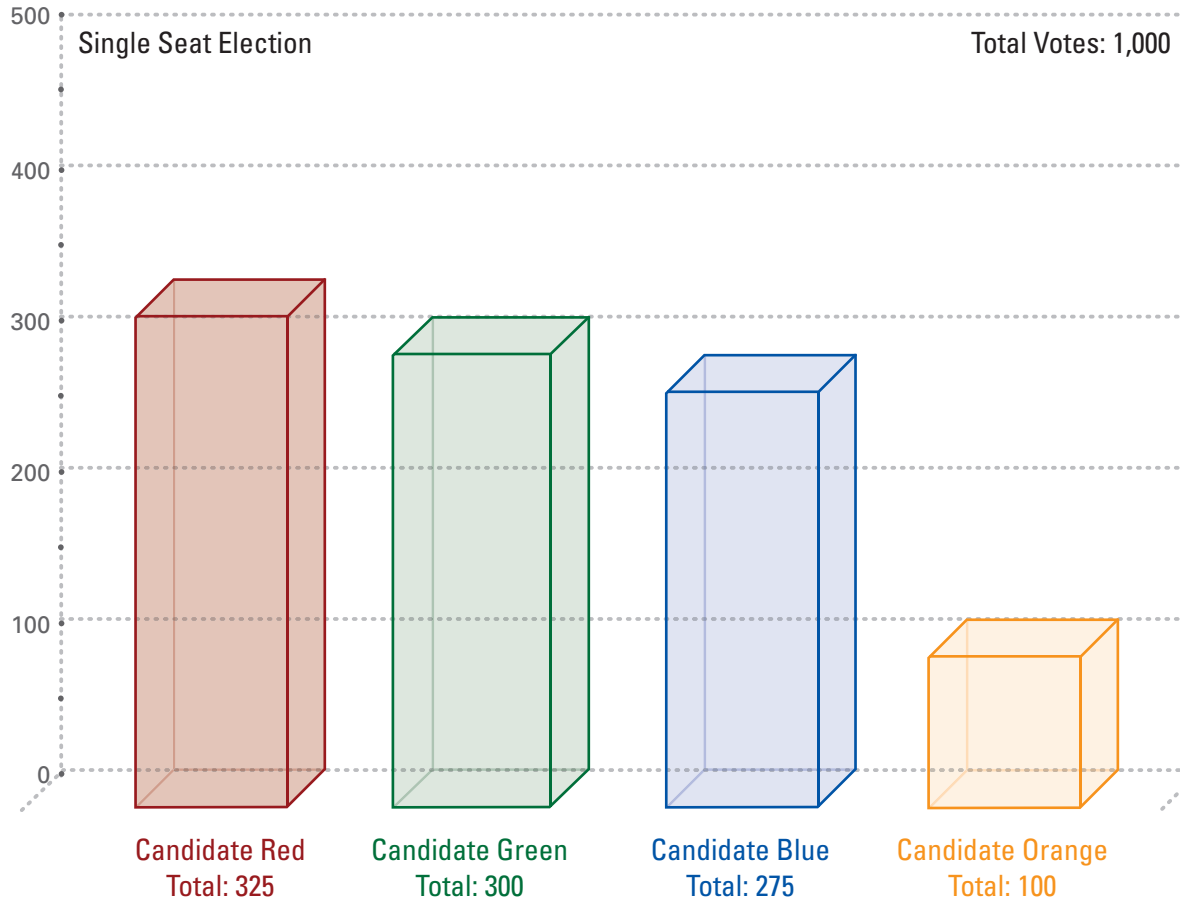


# **How Instant Runoff Voting (also known as Single Transferable Vote) Works**

# Ballot - Single Seat Election

Candidate	1st Choice	2nd Choice	3rd Choice	4th Choice
<b>Red</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Green</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Blue</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Orange</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Step 1: Count First Votes

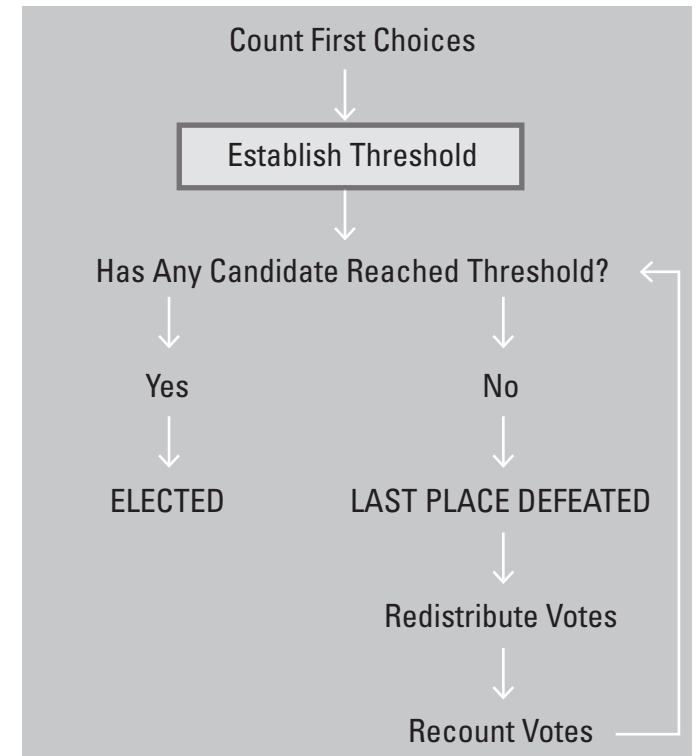
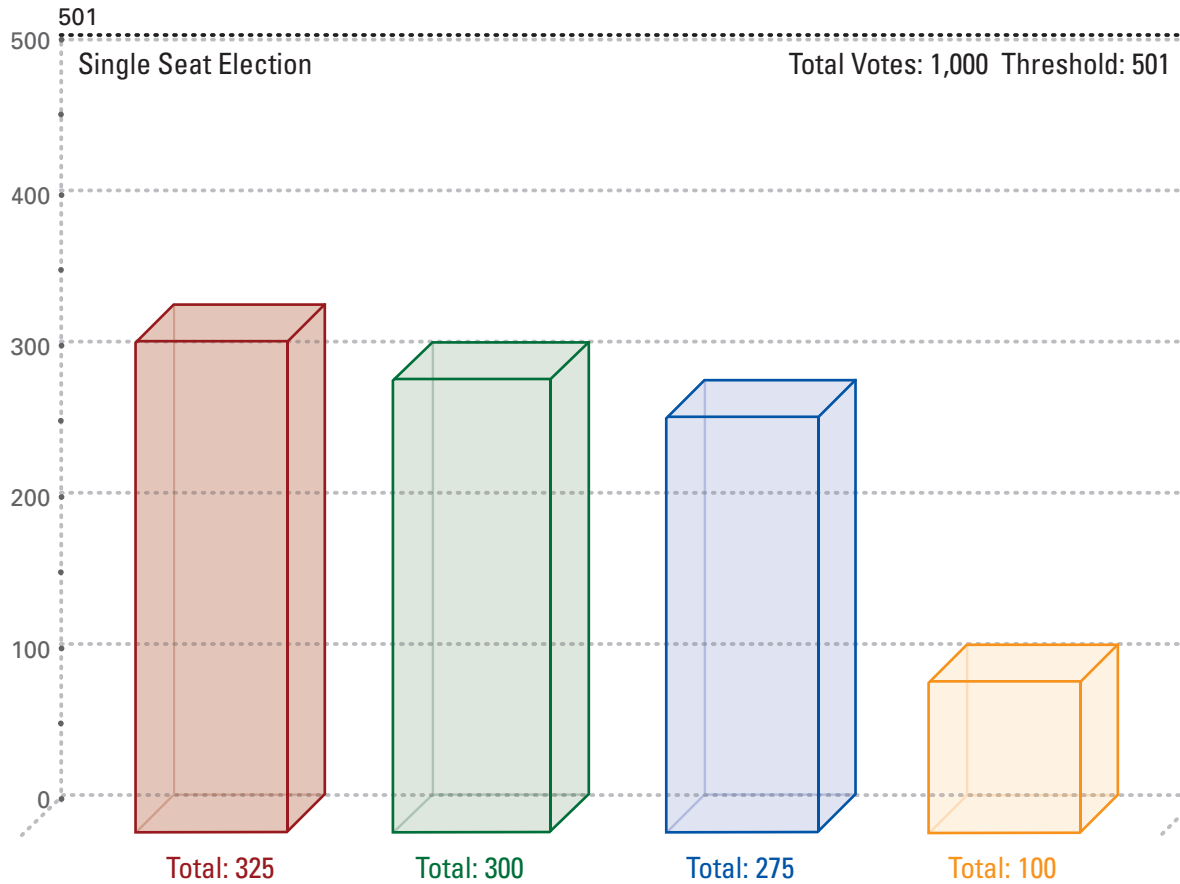


## Step 2: Establish Threshold to Win

Establish Threshold:

$$\text{WIN} = \left( \frac{\text{Votes}}{\text{Seats} + 1} \right) + 1$$

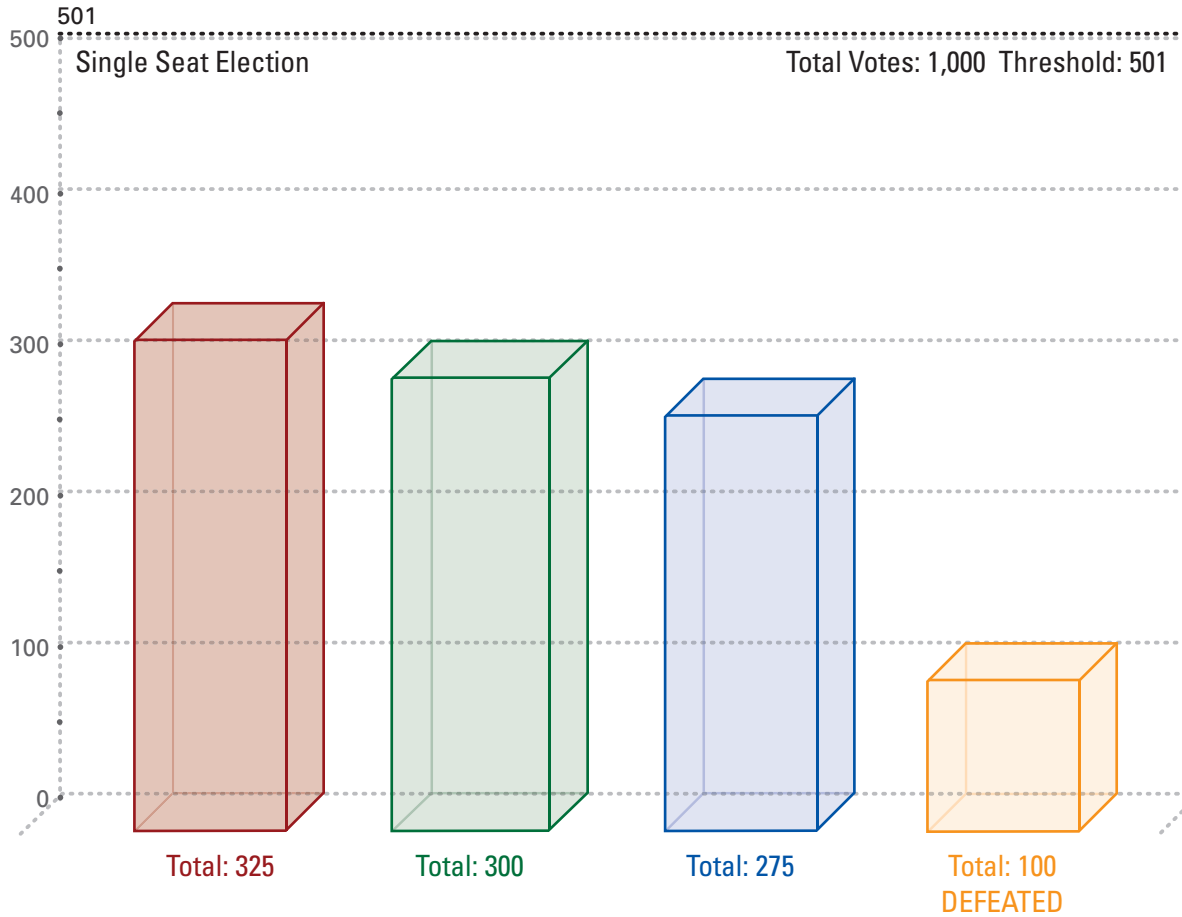
$$\text{WIN} = \left( \frac{1,000}{1+1} \right) + 1 = 500 + 1 = \mathbf{501}$$



### Step 3: Has Any Candidate Reached Threshold?

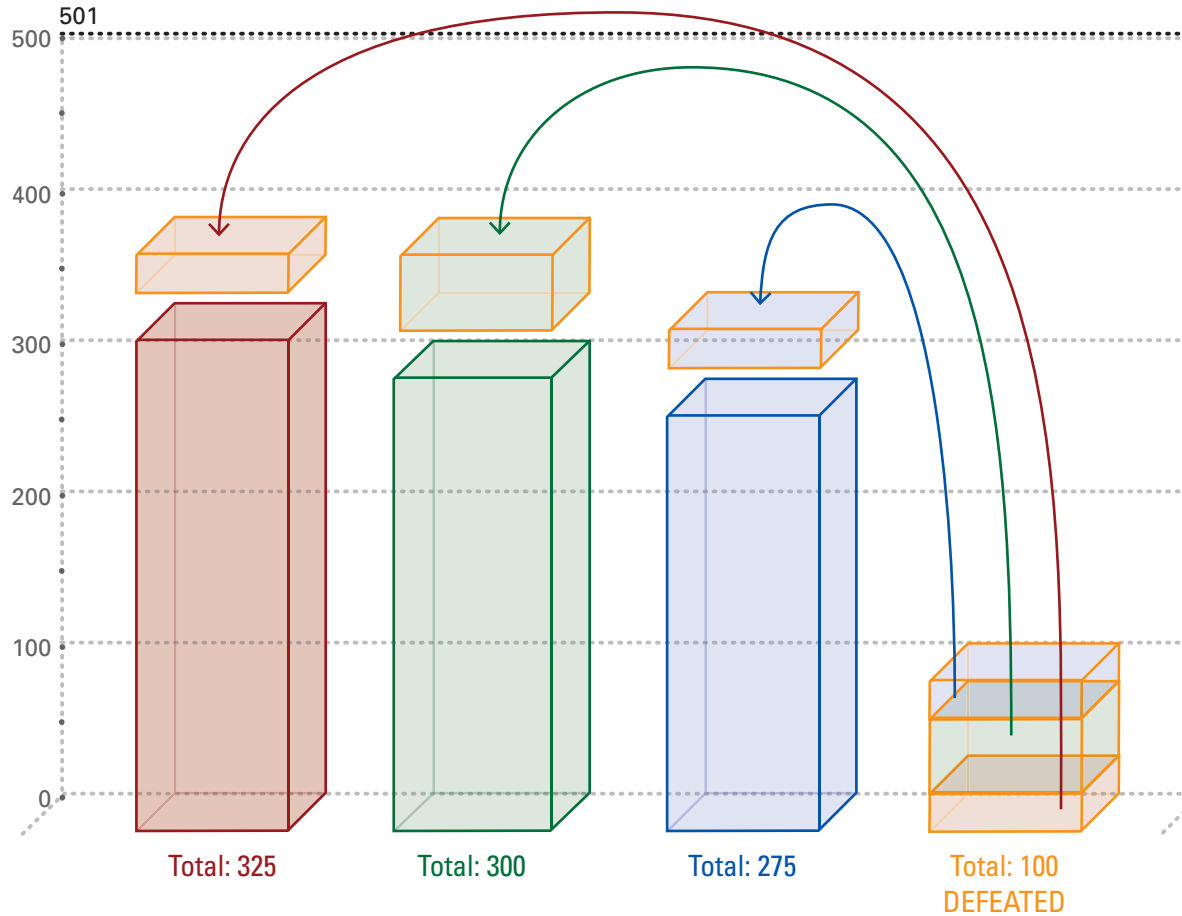
NO.

Candidate in last place is defeated.

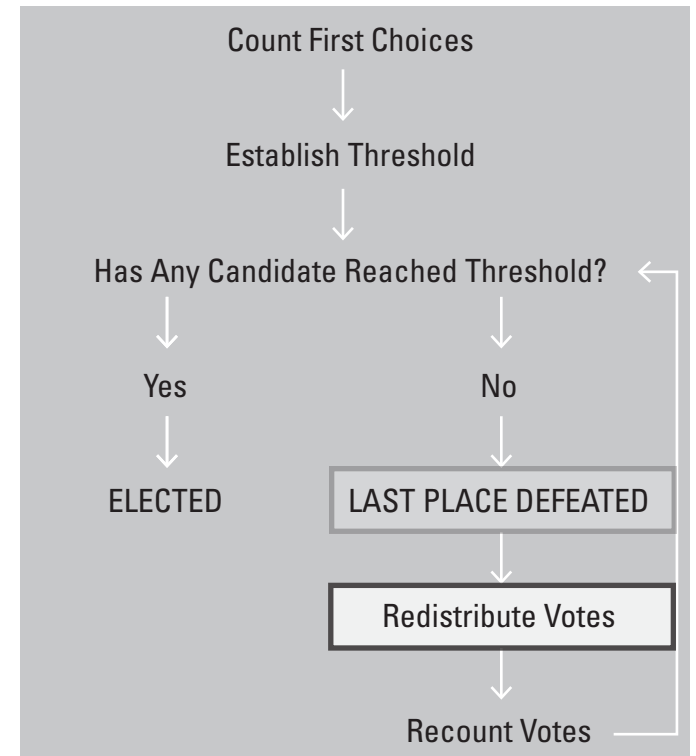


## Step 4: Redistribute Votes

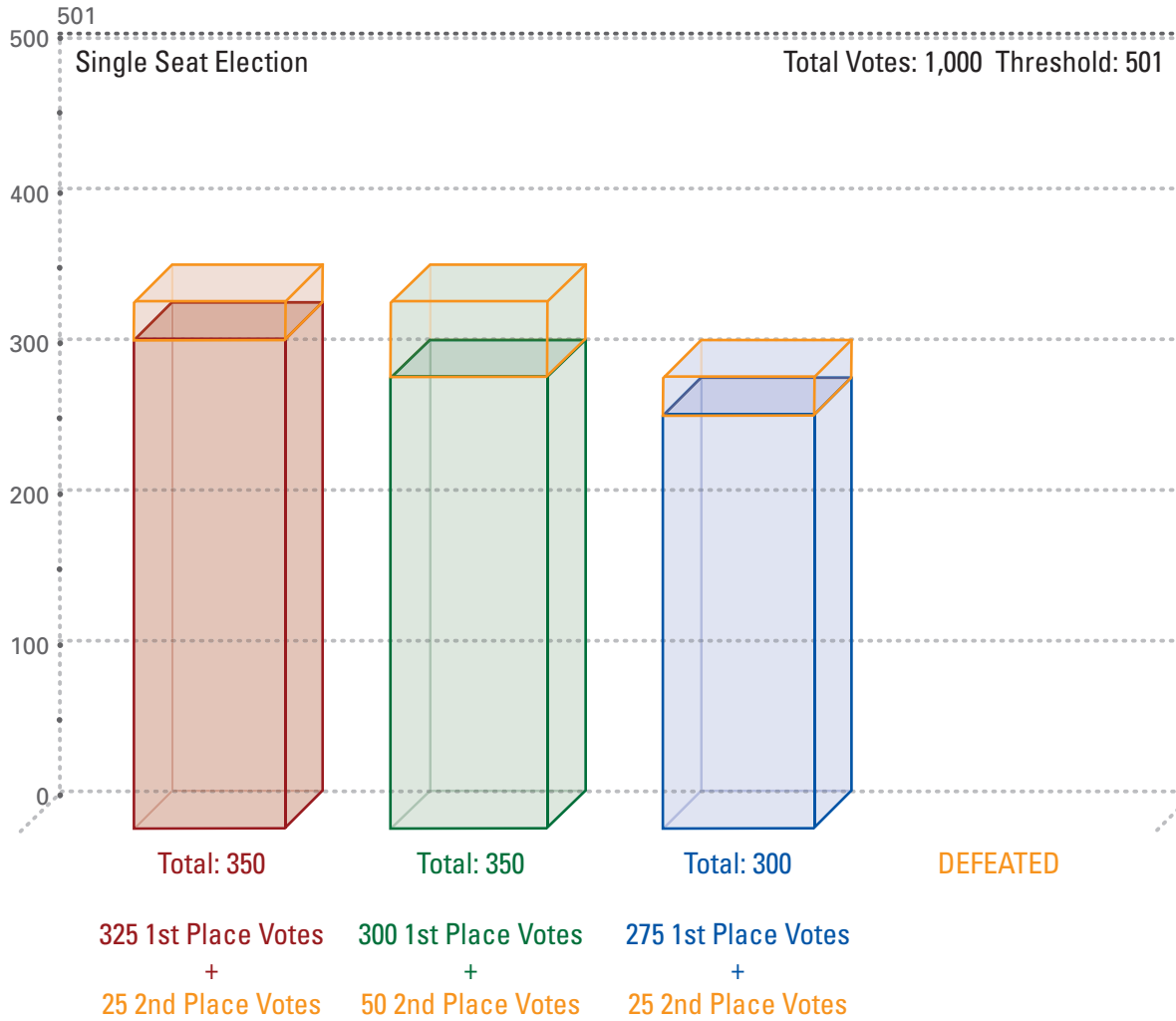
Last place candidate has ballots redistributed according to next place votes.



25 2nd Place Votes  
for Blue +  
50 2nd Place Votes  
for Green +  
25 2nd Place Votes  
for RED

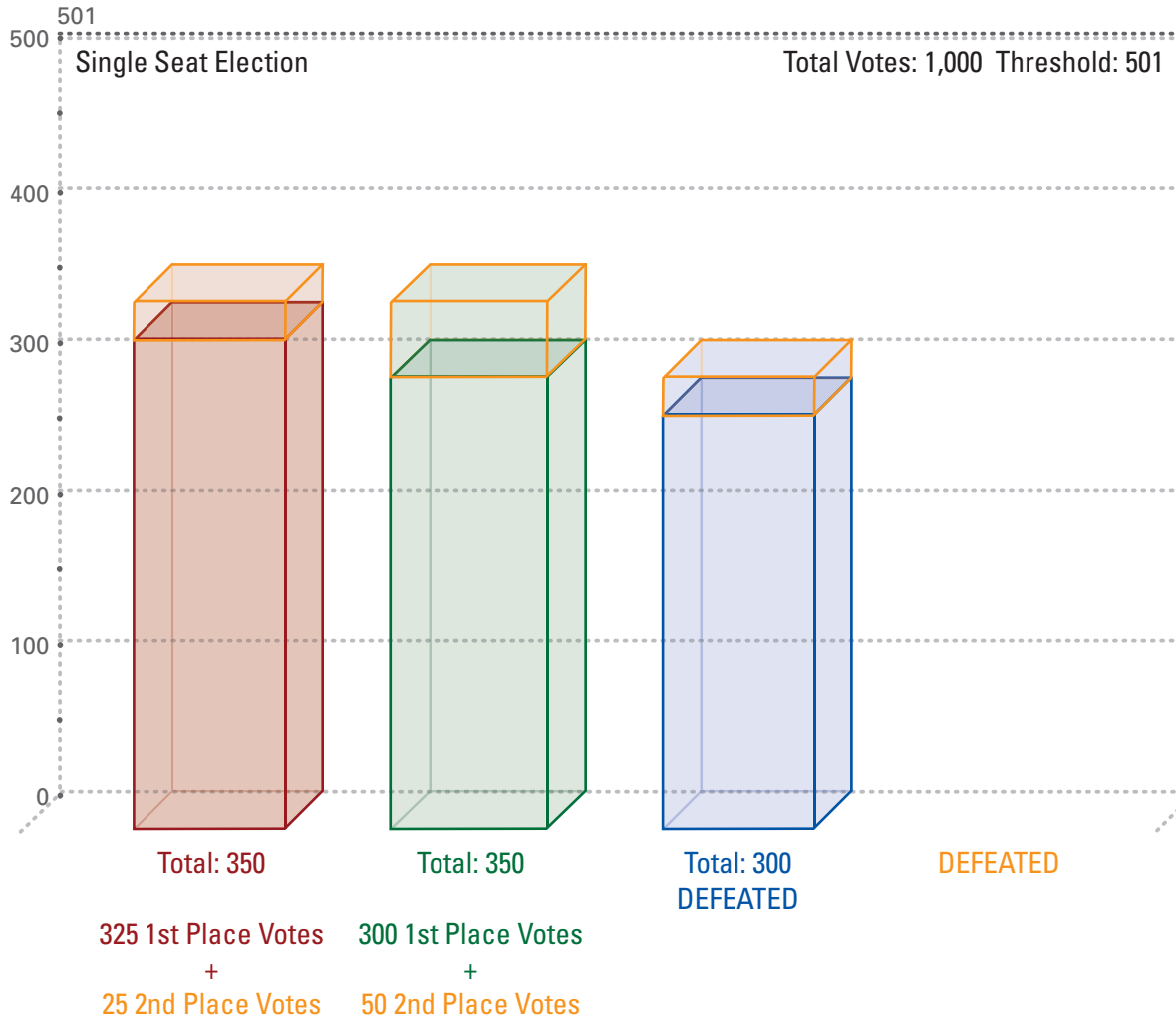


## Step 5: Recount Votes



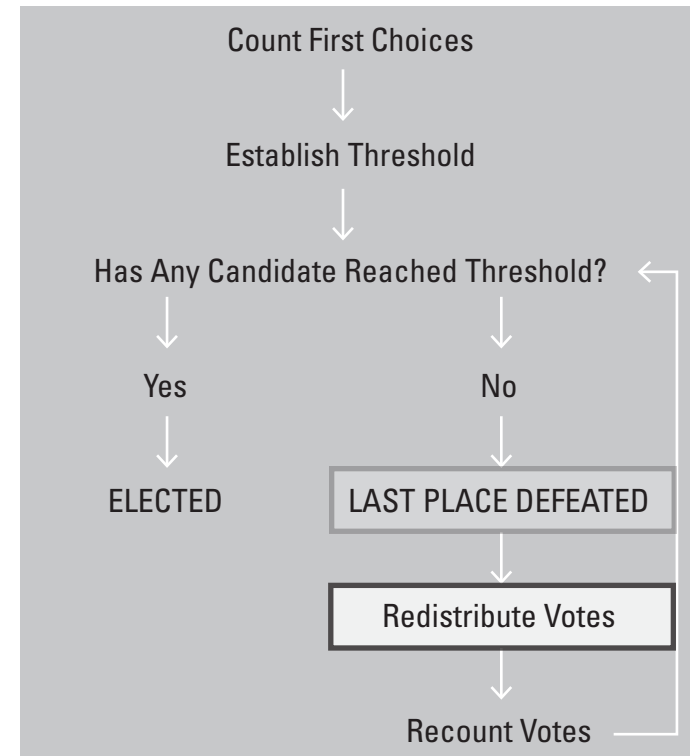
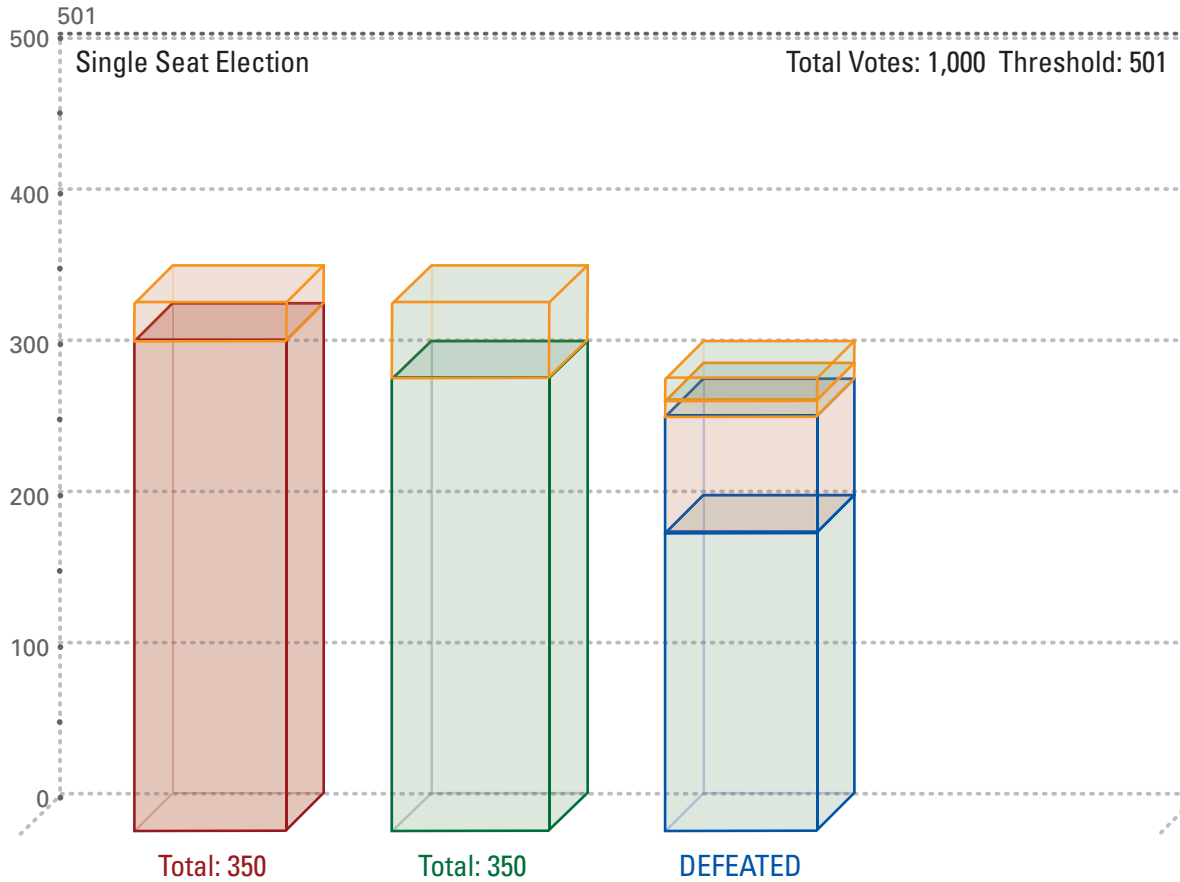
## Step 5: Recount Votes After Distribution

Has any candidate reached the threshold?  
NO. Candidate in last place is defeated.



## Step 6: Redistribute Votes

Last place candidate has ballots redistributed according to next place votes.



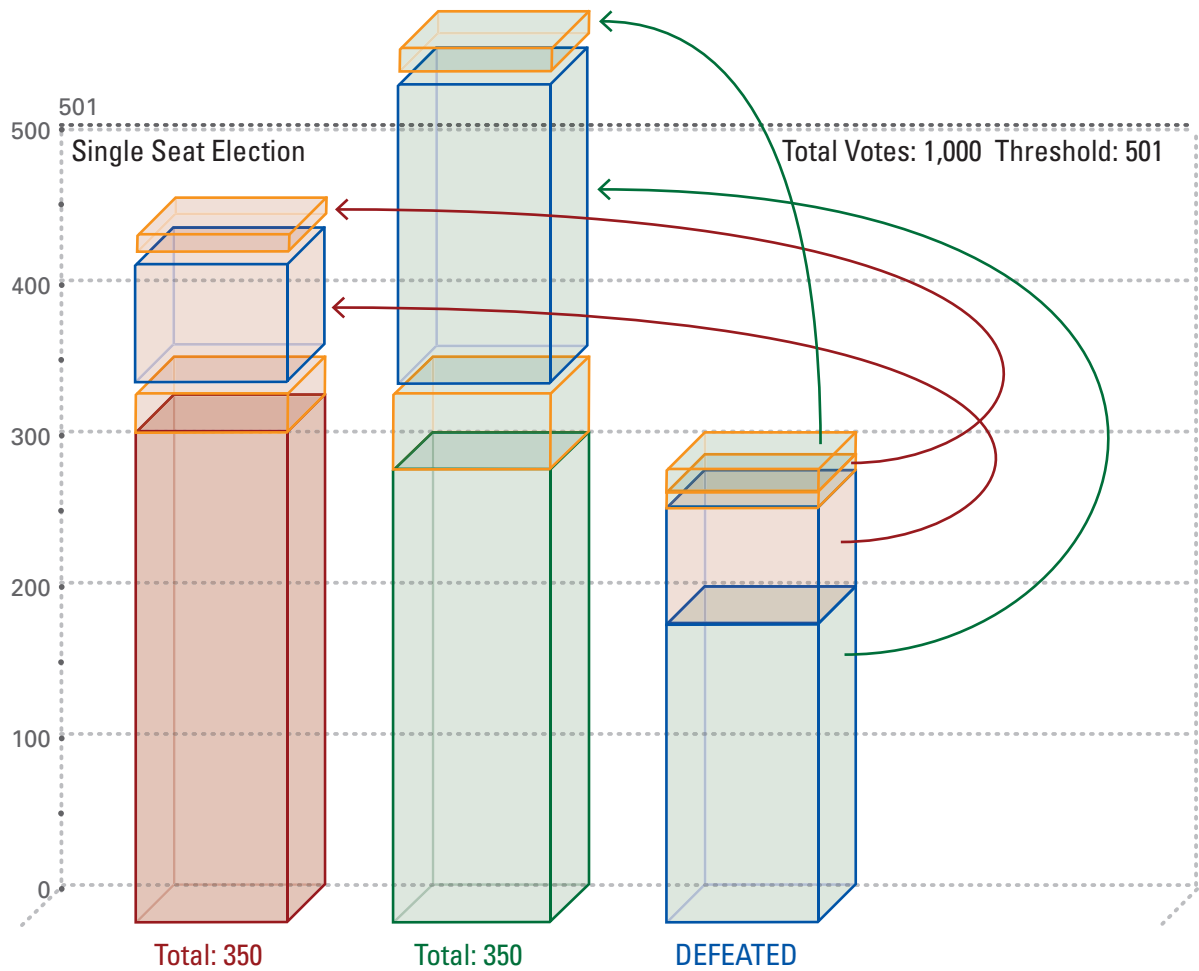
325 1st Place Votes + 25 2nd Place Votes

300 1st Place Votes + 50 2nd Place Votes

75 2nd Votes for Red + 200 2nd Votes for Green

10 3rd Votes for Red + 15 3rd Votes for Green

## Step 6: continued

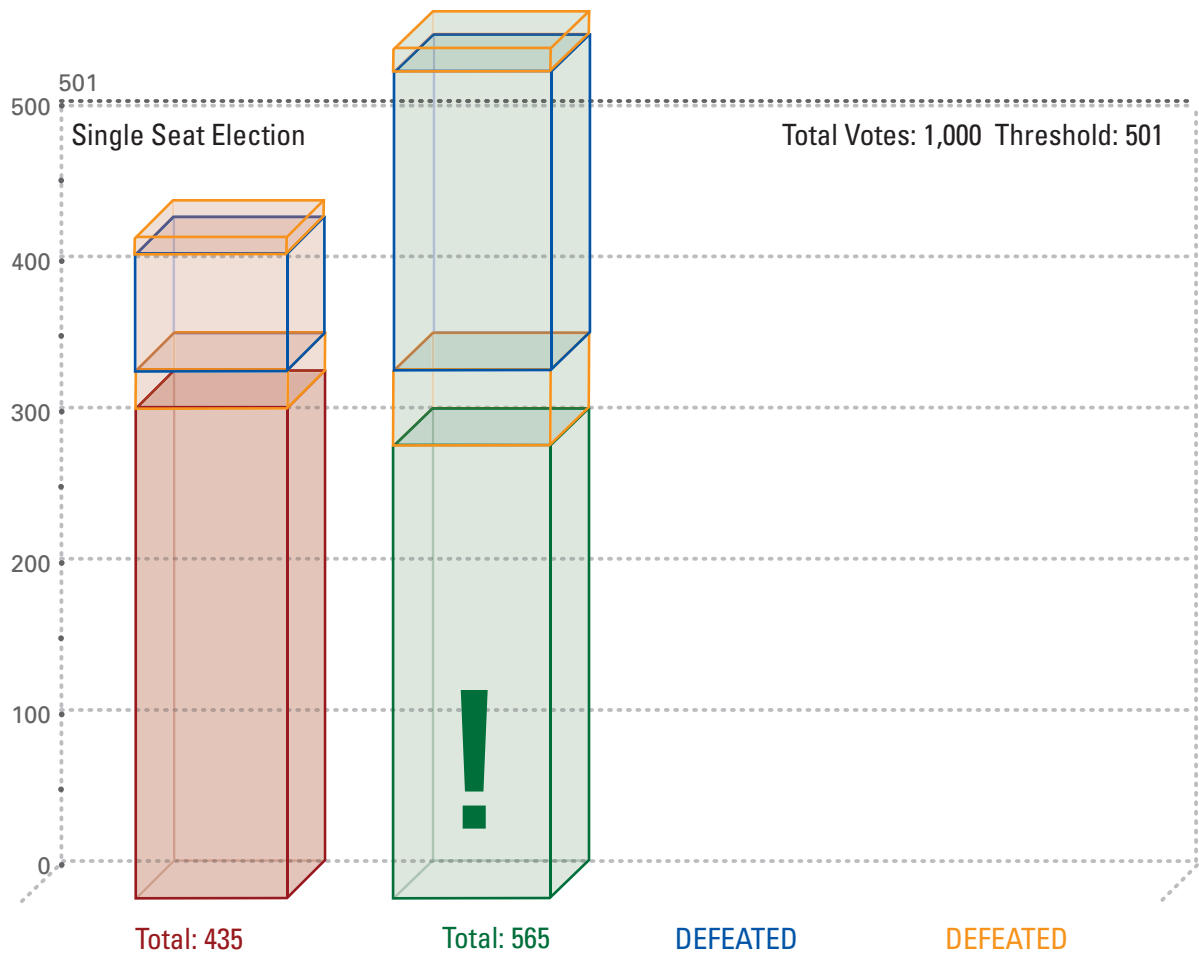


325 1st Place Votes + 25 2nd Place Votes  
 300 1st Place Votes + 50 2nd Place Votes  
 75 2nd Votes for Red + 200 2nd Votes for Green  
 10 3rd Votes for Red + 15 3rd Votes for Green



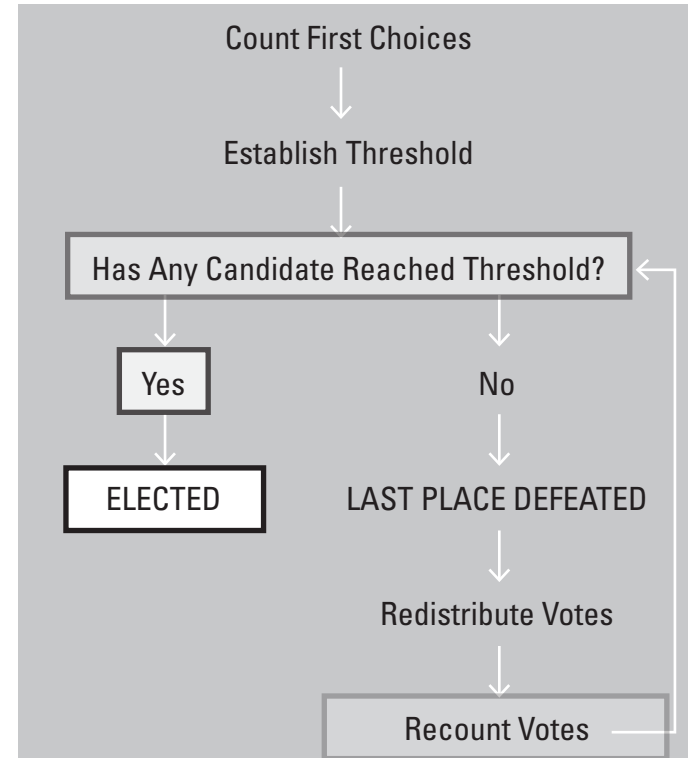
## Step 7: Has Any Candidate Reached Threshold?

YES.  
Candidate is elected.



325 1st Place Votes +  
25 2nd Place Votes +  
75 2nd Place Votes  
+ 10 3rd Place Votes

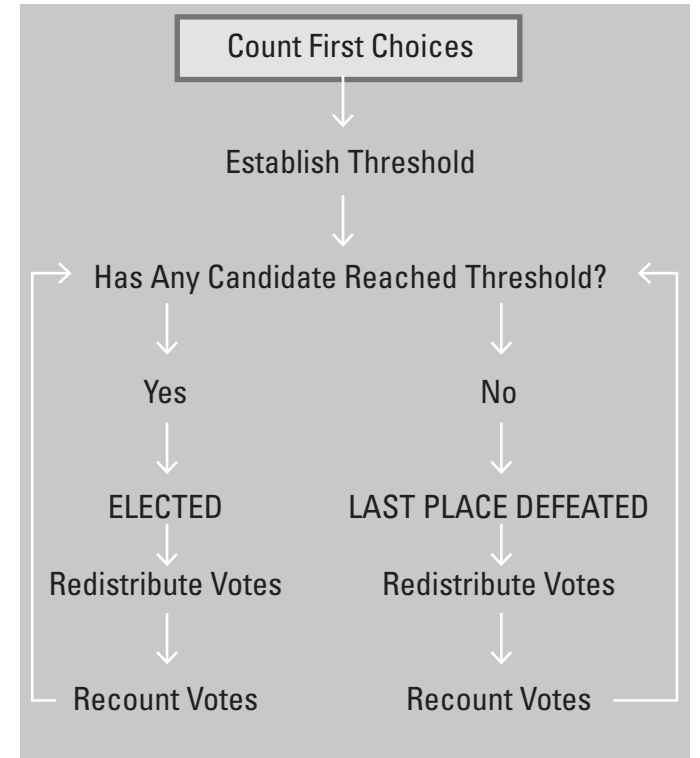
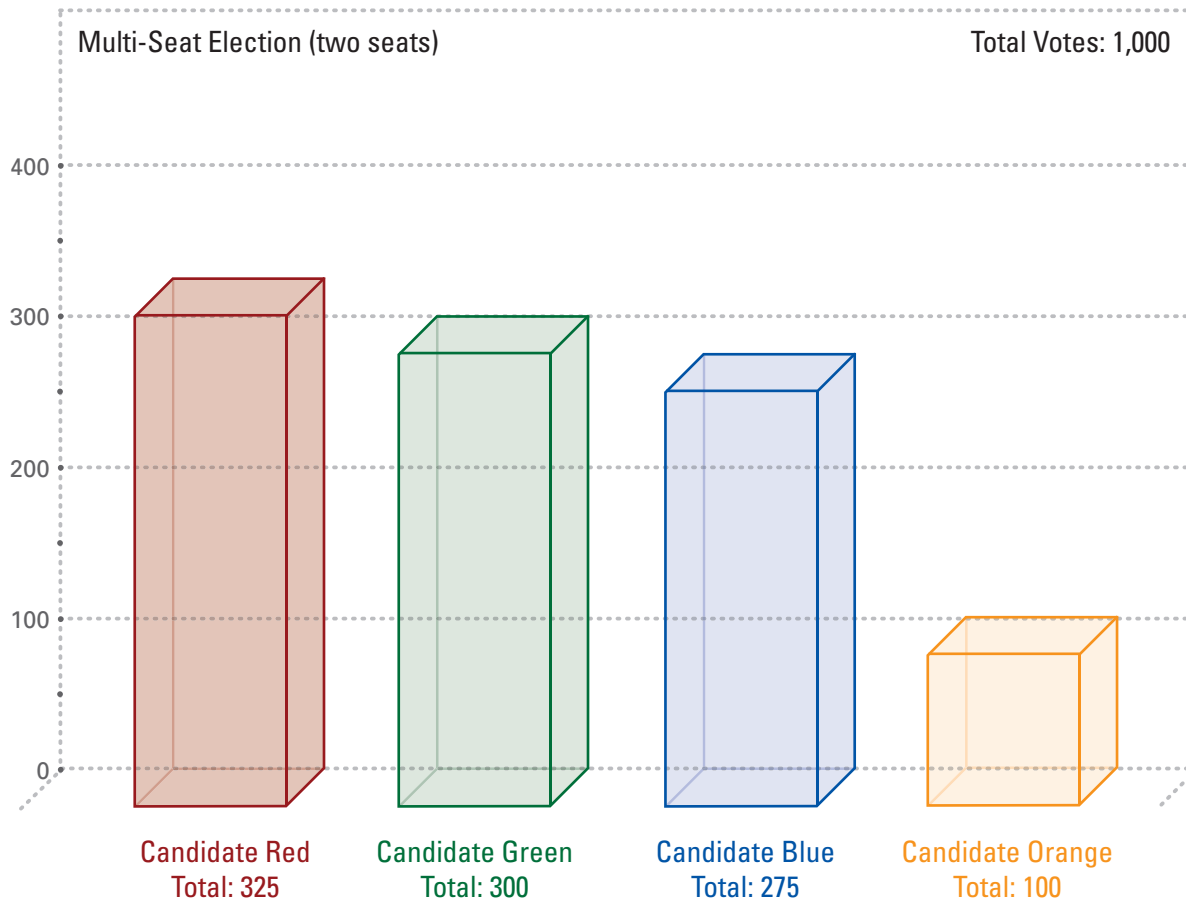
300 1st Place Votes +  
50 2nd Place Votes +  
200 2nd Place Votes  
+ 15 3rd Place Votes



# Ballot - Multi-Seat Election (2 seats)

Candidate	1st Choice	2nd Choice	3rd Choice	4th Choice
<b>Red</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Green</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Blue</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Orange</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Step 1: Count First Choices

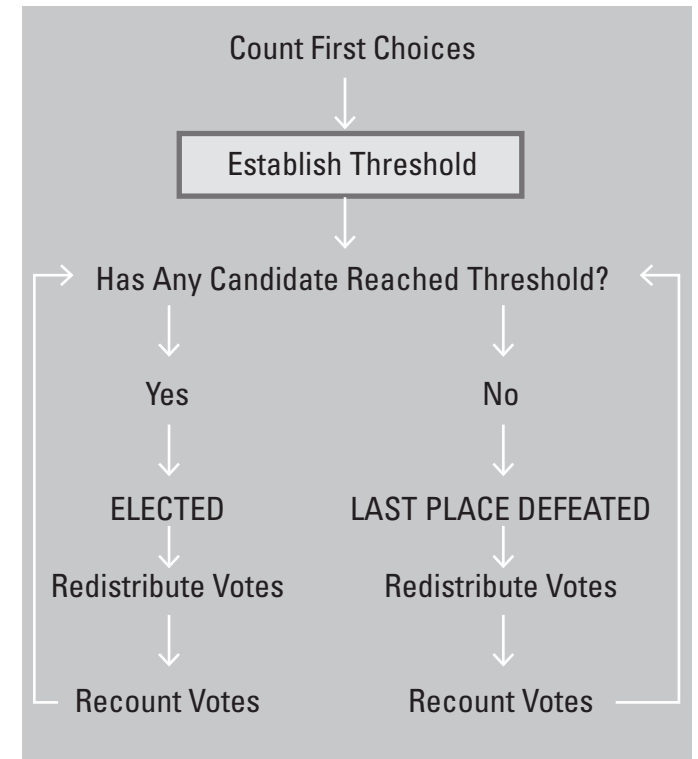
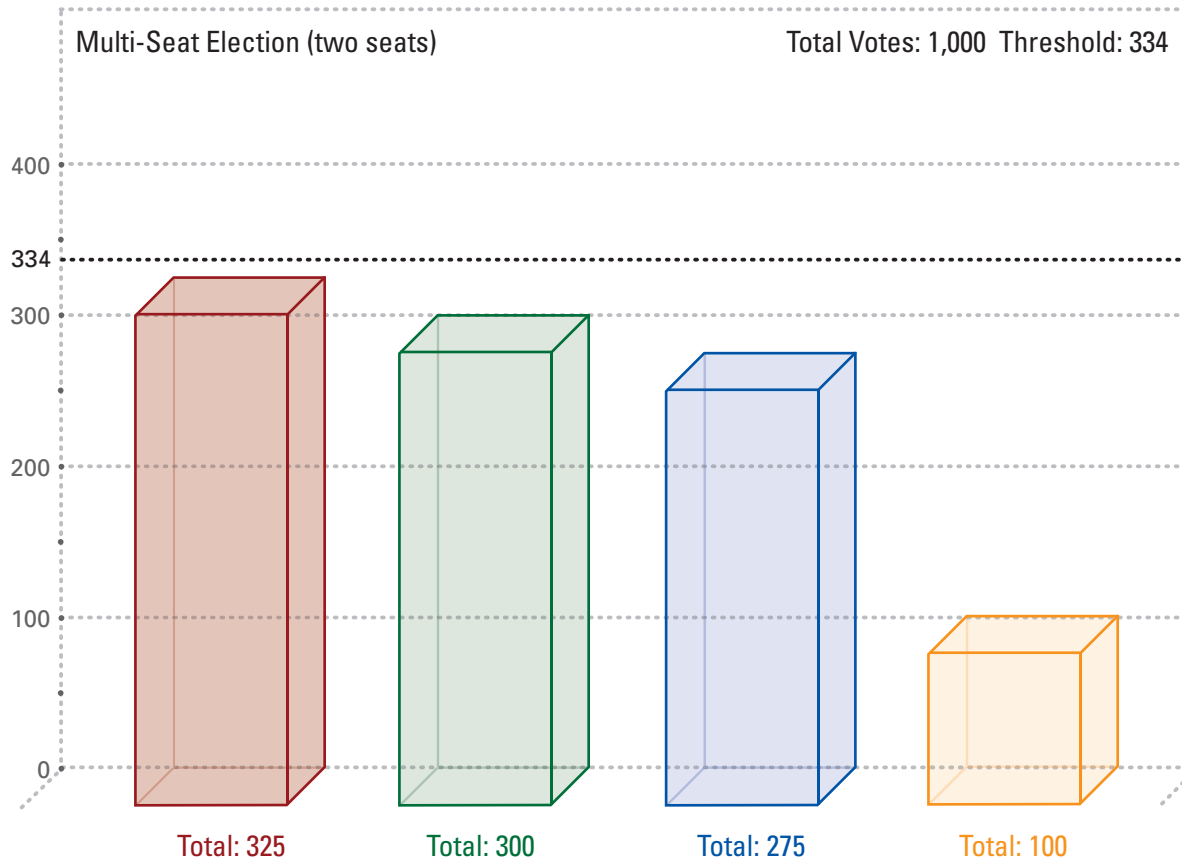


## Step 2: Establish Threshold to Win a Seat

Establish Threshold:

$$\text{WIN} = \left( \frac{\text{Votes}}{\text{Seats} + 1} \right) + 1$$

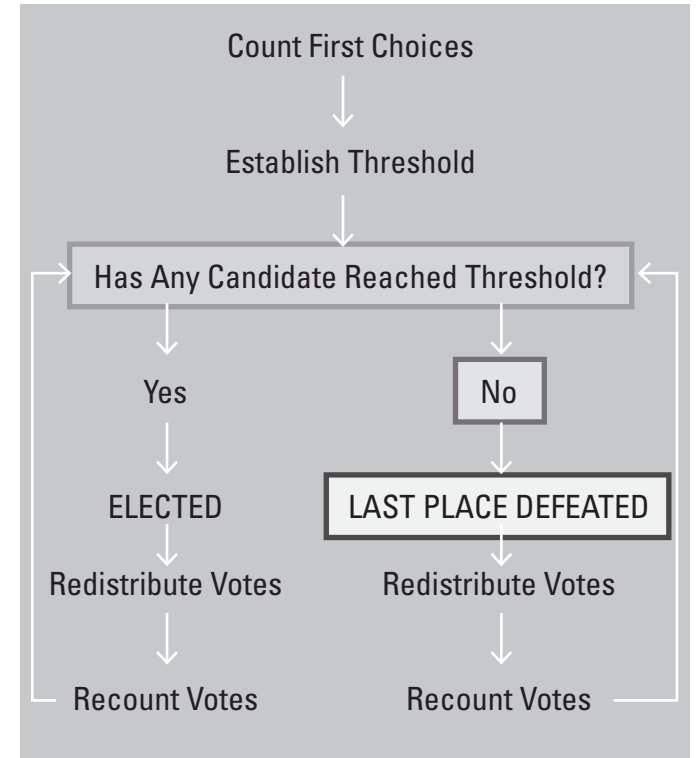
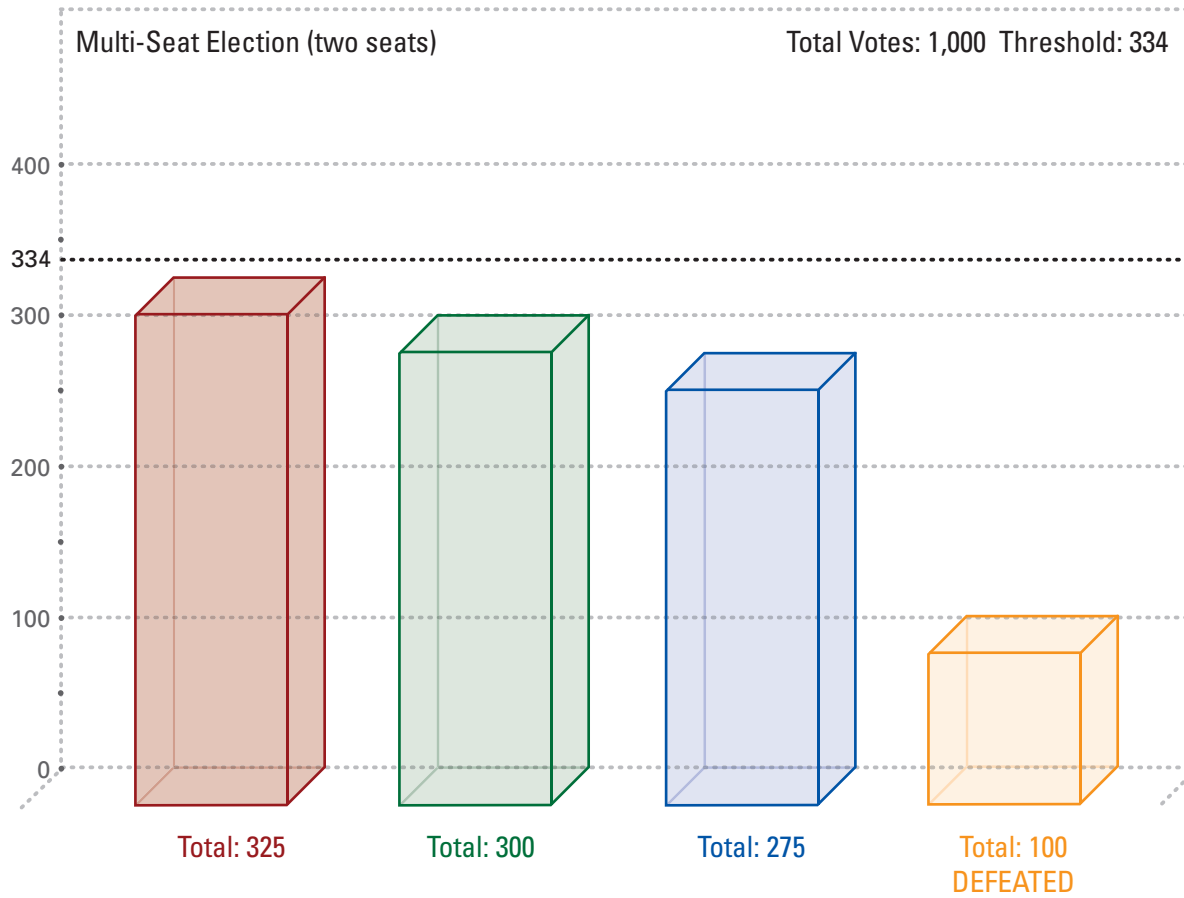
$$\text{WIN} = \left( \frac{1,000}{2 + 1} \right) + 1 = 333.3 + 1 = 334.3 \text{ (rounded to nearest whole number)} = \mathbf{334}$$



### Step 3: Has Any Candidate Reached the Threshold?

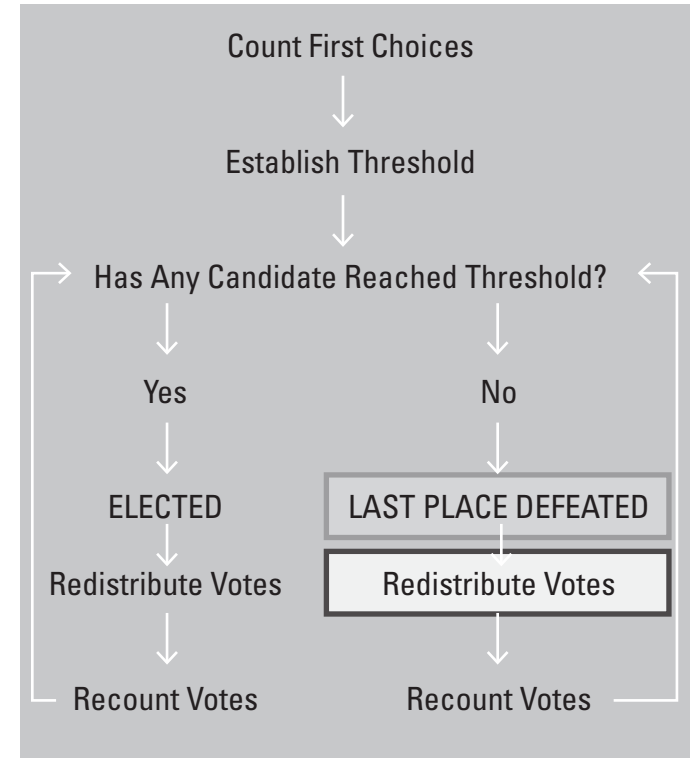
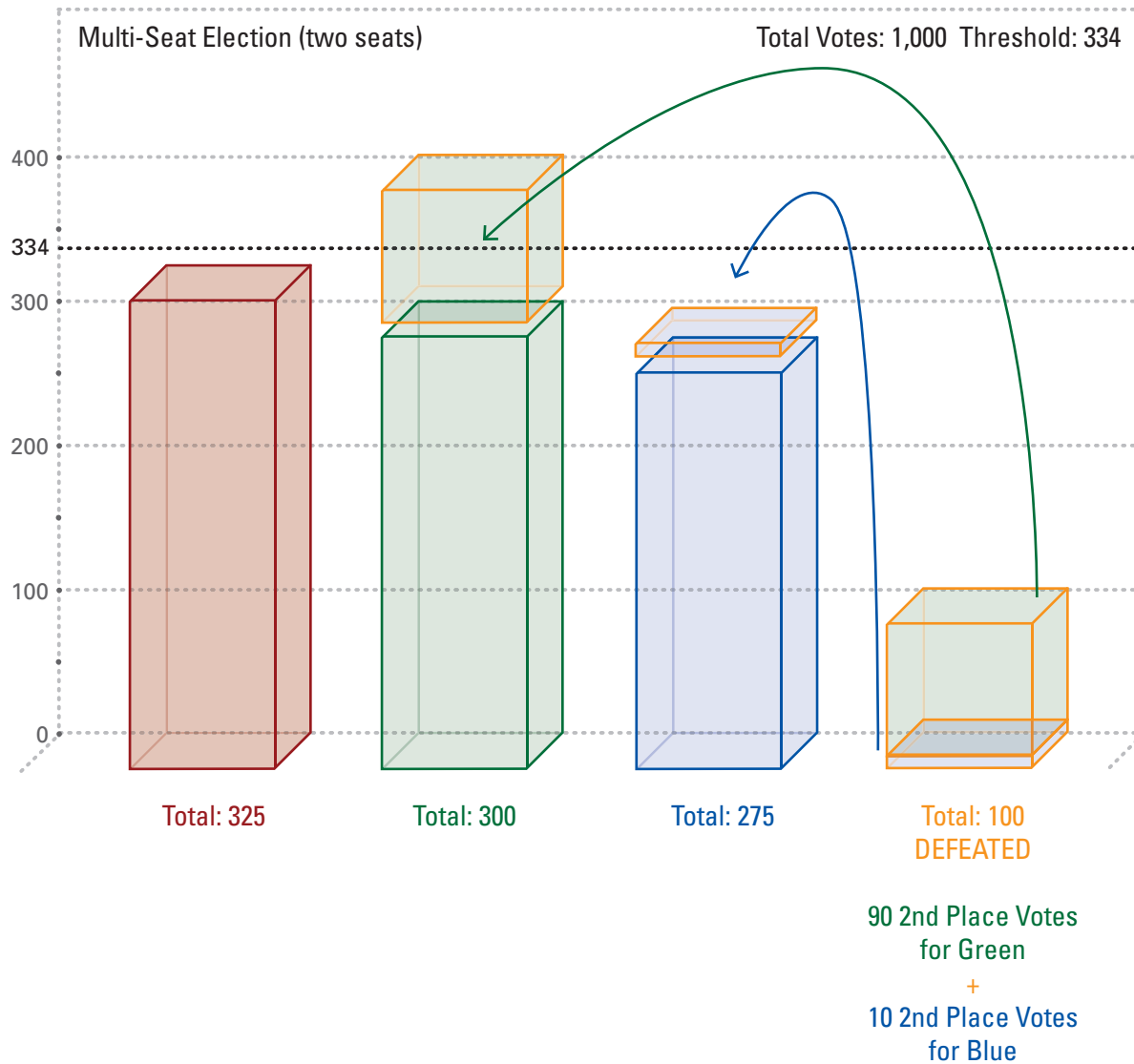
NO.

Candidate in last place is defeated.



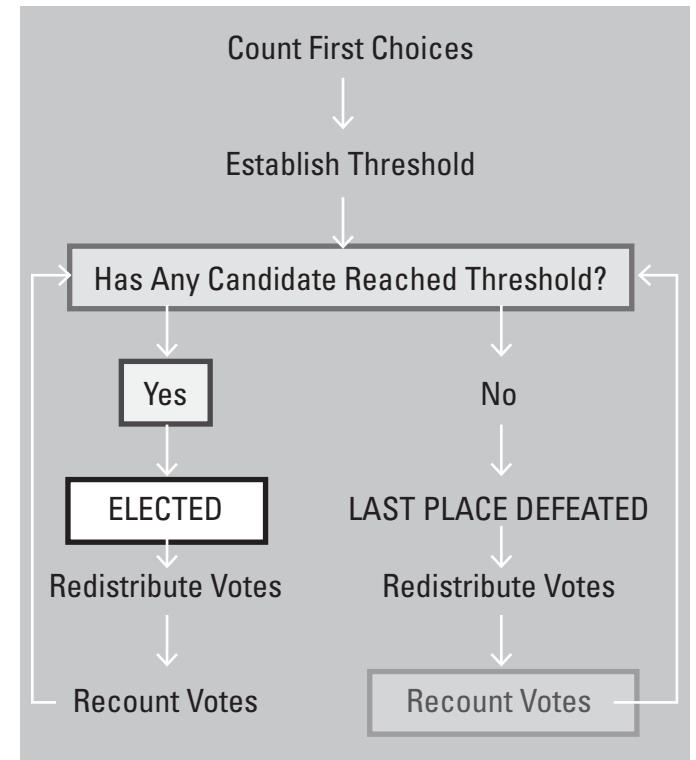
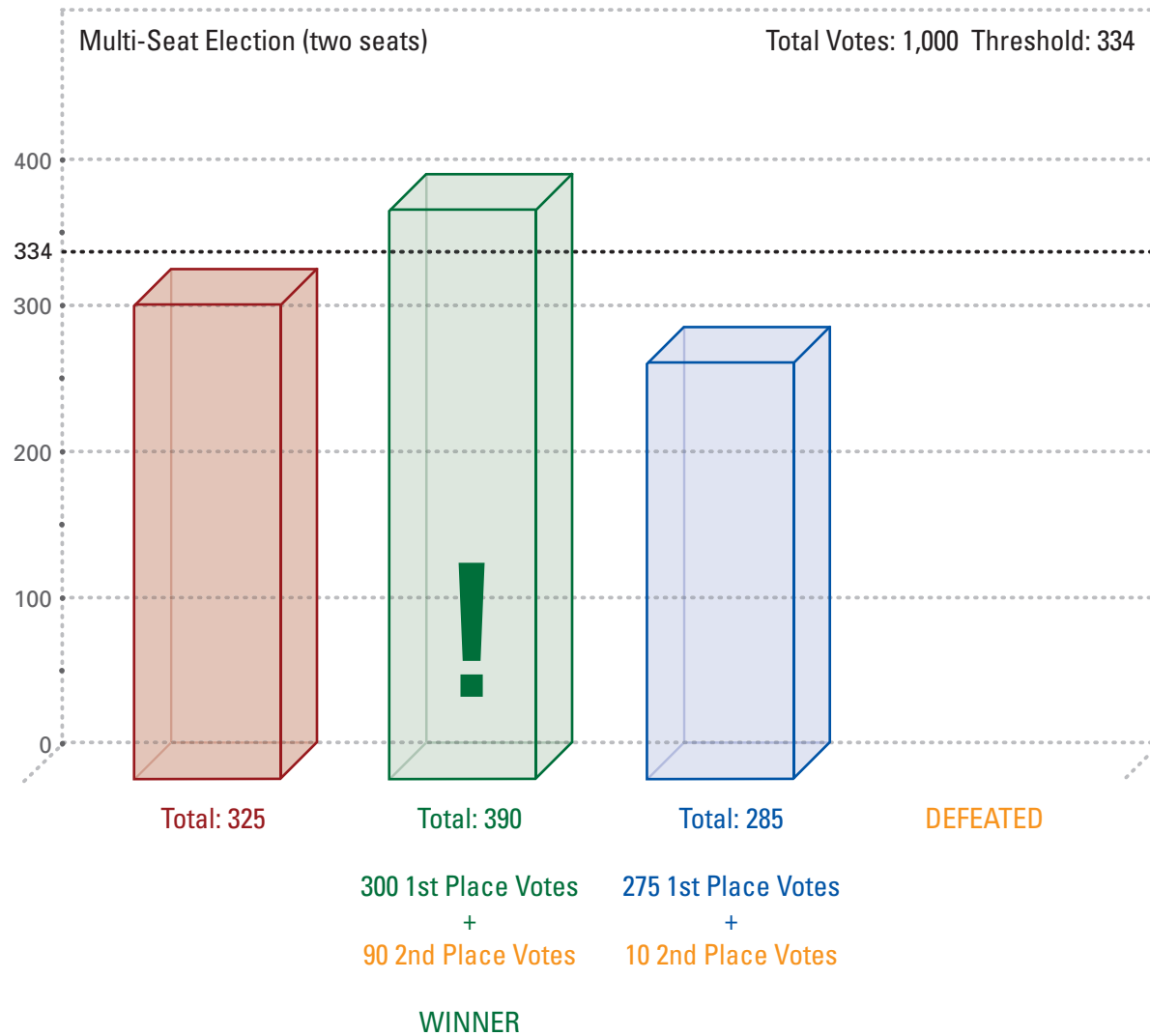
## Step 4: Redistribute Votes of Defeated Candidate

Last place candidate has ballots redistributed according to next place votes.



## Step 5: Has Any Candidate Reached the Threshold?

Recount after redistribution  
Has any candidate reached the threshold?  
YES. WINNER: GREEN



## Step 6: Redistribute Surplus Votes of the Winner

Green currently has more ballots than needed to win.

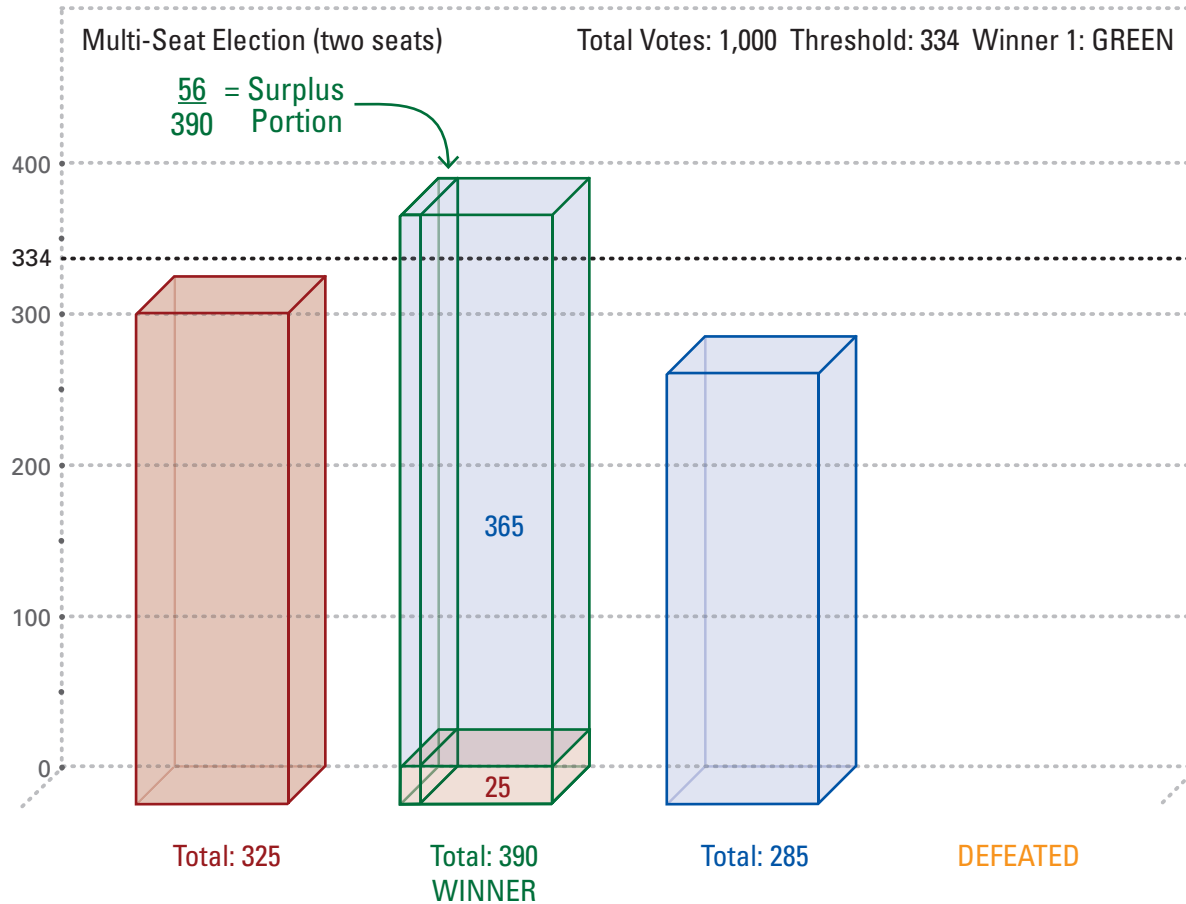
Ballots with 1st place votes for Green have 2nd place votes for another candidate, and should be allocated proportionally.

Surplus of Green Ballots:

Total Votes - Threshold = Surplus →  $390 - 334 = 56$

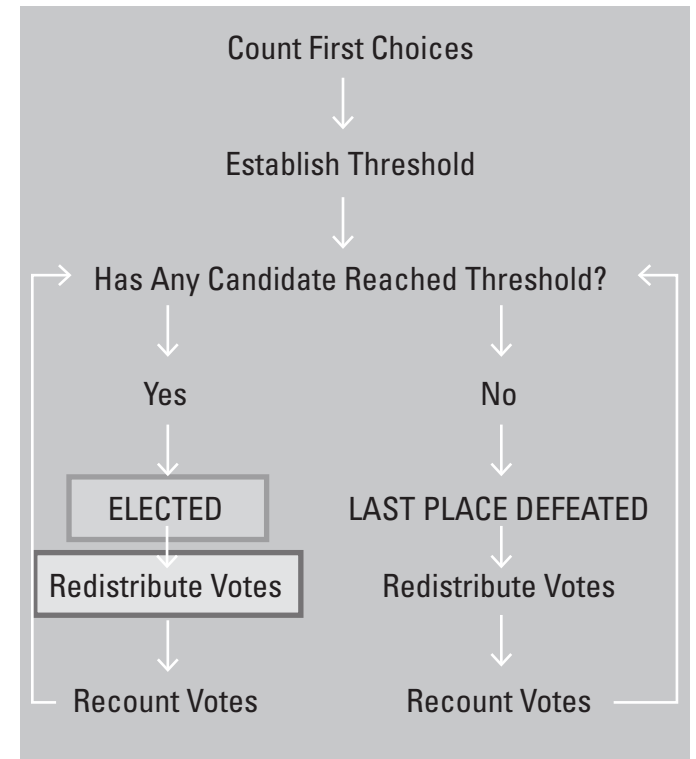
Surplus portion of each ballot =

$$\frac{\text{SURPLUS}}{\text{TOTAL \# OF BALLOTS}} = \frac{56}{390}$$



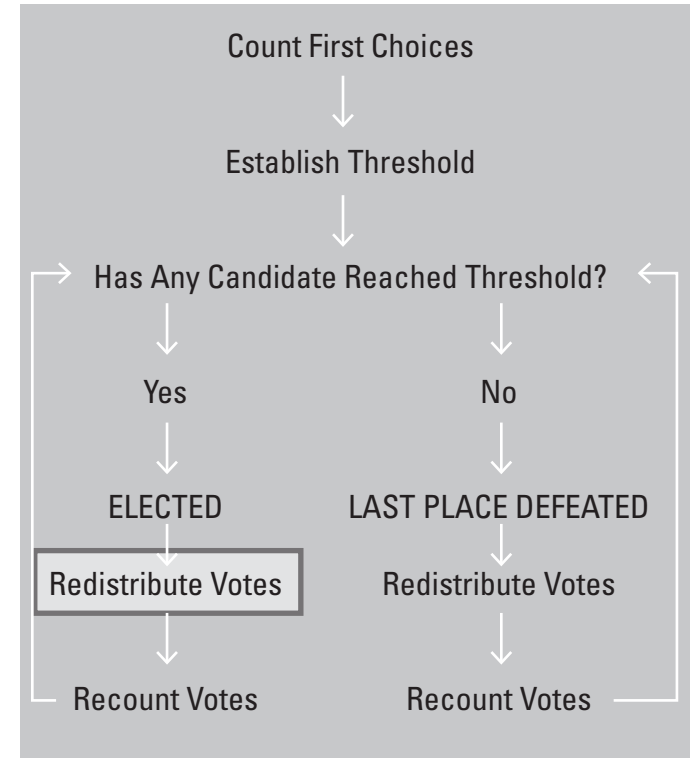
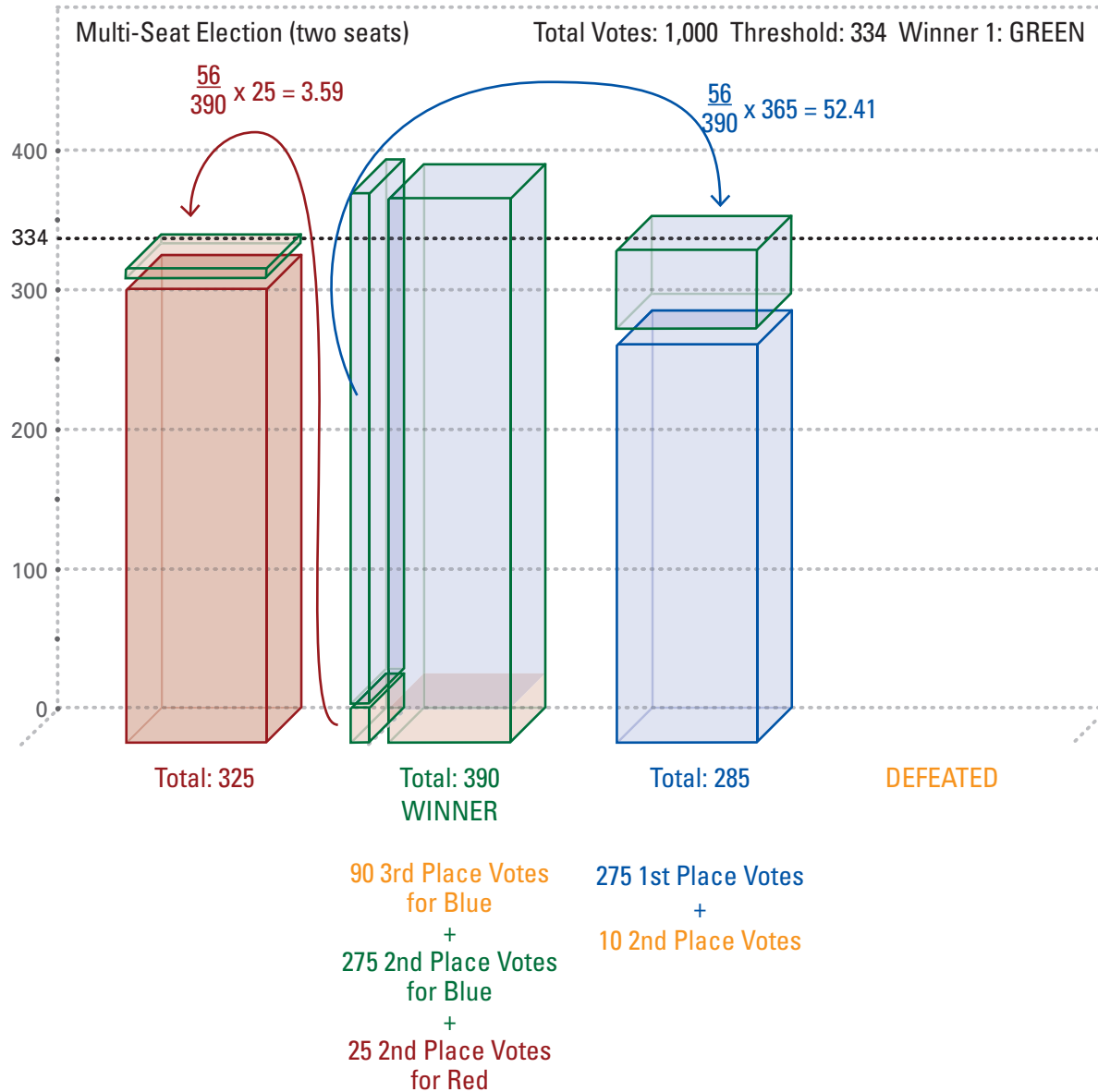
90 3rd Place Votes for Blue  
+  
275 2nd Place Votes for Blue  
+  
25 2nd Place Votes for Red

275 1st Place Votes  
+  
10 2nd Place Votes



## Step 6: Redistribute Surplus Votes of the Winner

Redistribution of Surplus Portion



## Step 7: Has Any Candidate Reached the Threshold?

Recount after redistribution  
 Has any candidate reached the threshold?  
 YES. WINNER: BLUE

