

## Voting Procedures

### Majority Rule

- Requires MORE than 50% of the votes in one category
- If no category has the required number of votes – no winner

### **Example #1**

Students at HRHS voted on their favorite sports team. The following tables shows the results:

Number of Votes	100	175	73	84
Sports Team	Hockey	Volleyball	Basketball	Soccer

Total number of votes =  $100 + 175 + 73 + 84 = 432$

50% of votes =  $0.5 \times 432 = 216$

No category has more than the required 216 – therefore no winner is declared.

### **Example #2**

One hundred people were polled about their favorite type of running shoes. The table below shows the results

Number of Votes	26	57	17
Shoe Brand	Nike	Asics	Saucony

Total number of votes = 100

50% of votes = 50

Asics has more than the required 50 – therefore they are declared the winner.

## **Plurality Voting**

- Winner is declared based on the most votes in a category.
- If a tie occurs – no winner is declared

### **Example #1**

Students at HRHS were asked to vote on a potential new mascot. The table below shows the results:

Number of Votes	257	198	120	10	501
Mascot	Hawks	Hogs	Hippos	Horses	Keep Same

Based on the MOST votes – HRHS will be keeping the same mascot

### **Example #2**

Students at HRHS were asked to vote on their favorite class. The following table shows the results from the poll:

Number of Votes	100	175	110	84	1	2
Class	Math	Science	Phys Ed	Art	Ethics	English

Based on the MOST votes – Science was voted the favorite class amongst students

## **Borda Count**

- Winner is declared based on point system for ranking preferences
- Points allotted for preferences is determined by you

### **Example #1**

Students at HRHS were polled to determine the newest sports team to be introduced in the fall. The table below shows the results:

Number of Votes	18	27	9	31
1 <sup>st</sup> Choice	Bowling	Handball	Bowling	Ping Pong
2 <sup>nd</sup> Choice	Ping Pong	Ping Pong	Handball	Bowling
3 <sup>rd</sup> Choice	Handball	Bowling	Ping Pong	Handball

3 points for 1<sup>st</sup> place

2 points for 2<sup>nd</sup> place

1 point for 3<sup>rd</sup> place

Bowling:

$$18(3) + 27(1) + 9(3) + 31(2) = 170$$

Ping Pong:

$$18(2) + 27(2) + 9(1) + 31(3) = 192 \text{ points}$$

Handball:

$$18(1) + 27(3) + 9(2) + 31(1) = 148$$

The winner would be ping pong based on the total number of points.

## Example #2

Students at HRHS were polled to determine their preference for the next school trip. The table below shows the results

Number of Votes	54	73	36	40
1 <sup>st</sup> Choice	Australia	Brazil	Russia	Scotland
2 <sup>nd</sup> Choice	Scotland	Australia	Brazil	Russia
3 <sup>rd</sup> Choice	Russia	Scotland	Australia	Brazil
4 <sup>th</sup> Choice	Brazil	Russia	Scotland	Australia

4 Points for 1<sup>st</sup> place

3 Points for 2<sup>nd</sup> Place

2 Points for 3<sup>rd</sup> Place

1 Point for 4<sup>th</sup> Place

Australia:

$$54(4) + 73(3) + 36(2) + 40(1) = 547$$

Scotland:

$$54(3) + 73(2) + 36(1) + 40(4) = 504$$

Russia:

$$54(2) + 73(1) + 36(4) + 40(3) = 445$$

Brazil:

$$54(1) + 73(4) + 36(3) + 40(2) = 534$$

Australia would be declared the winner based on the most votes.

## Condorcet Method

- Uses a preference system to rank categories
- “One vs One Matchups” used to declare winner
- All categories must be matched up against every other category

### Example #1

Students at HRHS were polled about their favorite cologne. The table below shows the results:

Number of Votes	12	36	15	22
1 <sup>st</sup> Choice	Polo	Armani	JP Gauthier	Polo
2 <sup>nd</sup> Choice	Armani	Polo	Armani	JP Gauthier
3 <sup>rd</sup> Choice	JP Gauthier	JP Gauthier	Polo	Armani

Determine who is ranked HIGHER and that category gets the votes.

Polo vs Armani

12	36
22	15
<hr/>	
34	51

Polo vs JP Gauthier

12	15
36	
22	
<hr/>	
70	15

Armani vs JP Gauthier

12	15
36	22
<hr/>	
48	37

Polo = 1 Win

Armani = 2 Wins

JP Gauthier = 0 Wins

Armani is the winner based on more 1 on 1 matchup wins.

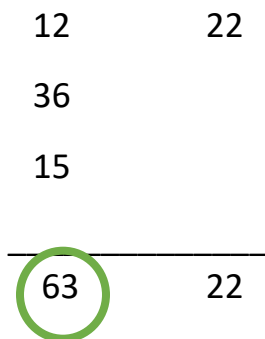
## Example #2

Students were polled about their favorite fast food restaurants. The table below shows the results:

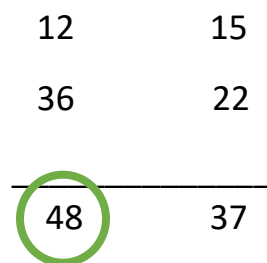
Number of Votes	12	36	15	22
1 <sup>st</sup> Choice	Wendys	Tim Hortons	Subway	Kojax
2 <sup>nd</sup> Choice	Kojax	Wendys	Tim Hortons	Subway
3 <sup>rd</sup> Choice	Subway	Kojax	Wendys	Tim Hortons
4 <sup>th</sup> Choice	Tim Hortons	Subway	Kojax	Wendys

Determine who is ranked HIGHER and that category gets the votes.

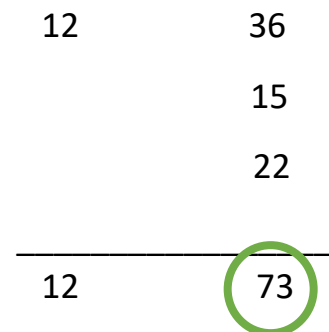
Wendys vs Kojax



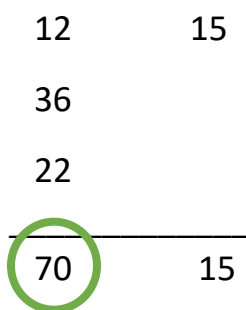
Wendys vs Subway



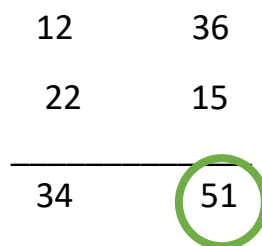
Wendys vs Tim Hortons



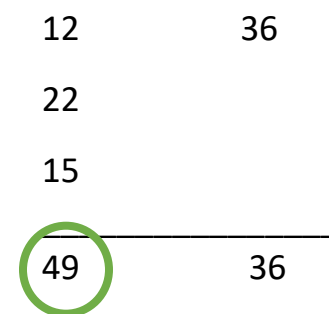
Kojax vs Subway



Kojax vs Tim Hortons



Subway vs Tim Hortons



Wendy's = 2 Wins

Kojax = 1 Wins

Subway = 1 Win

Tim Hortons = 2 wins

## Elimination Method

- Preferences used to rank choice
- Only 1<sup>st</sup> place votes counted
- Eliminate lowest number of 1<sup>st</sup> place votes – eliminated votes go to next candidate in that particular category
- Elimination process continues until 1 candidate remains

### Example #1

Votes	45	32	28	23
1 <sup>st</sup> Choice	B	C	A	A
2 <sup>nd</sup> Choice	C	B	C	B
3 <sup>rd</sup> Choice	A	A	B	C

#### Round 1

A has  $28 + 23 = 51$  1<sup>st</sup> place votes

B has **45** 1<sup>st</sup> place votes

C has **32** first place votes

C is eliminated and their votes go to the candidate under them in their column → which is B

#### Round 2

A has **51** 1<sup>st</sup> place votes

B has  $45 + 32 = 77$  1<sup>st</sup> place votes

A is eliminated → B wins

## Example #2

Students were asked to rank their choices for the next Winter Carnival activities.  
The table below shows the results.

Votes	45	32	28	23
1 <sup>st</sup> Choice	Laser Quest	Rock Climbing	Jail Break	Go-Karting
2 <sup>nd</sup> Choice	Jail Break	Laser Quest	Rock Climbing	Jail Break
3 <sup>rd</sup> Choice	Rock Climbing	Jail Break	Laser Quest	Rock Climbing
4 <sup>th</sup> Choice	Go-Karting	Go-Karting	Go-Karting	Laser Quest

### Round 1

Laser Quest has **45** 1<sup>st</sup> Place Votes

Rock Climbing has **32** 1<sup>st</sup> Place Votes

Jail Break has **28** 1<sup>st</sup> Place Votes

Go-Karting has **23** 1<sup>st</sup> Place Votes

Go-Karting is eliminated & their votes go to the next in their column → Jail Break

### Round 2

Laser Quest has **45** 1<sup>st</sup> Place Votes

Rock Climbing has **32** 1<sup>st</sup> Place Votes

Jail Break has  $28 + 23 = \mathbf{51}$  1<sup>st</sup> Place Votes

Rock Climbing is eliminated & their votes go to the next in their column → Laser Quest

### Round 3

Laser Quest has  $45 + 32 = \mathbf{77}$  1<sup>st</sup> Place Votes

Jail Break has **51** 1<sup>st</sup> Place Votes

Jail Break is eliminated & Laser Quest WINS 😊



### Approval Voting

- You can vote for as many choices as you wish
- Candidate with most votes, wins

#### Example #1

Number of Votes	45	32	28	23
	A	B	A	A
	D	C	B	
		D	C	

A has  $45 + 28 + 23 = 96$  votes

B has  $32 + 28 = 60$  votes

C has  $32 + 28 = 60$  votes

D has  $45 + 32 = 77$  votes

A is the winner because it has the most votes.

#### Example #2

Number of Votes	14	6	13	5
	A	B	D	C
	D	C	B	D
		D	C	

A has **14 votes**

B has  $6 + 13 = \mathbf{19}$  votes

C has  $6 + 13 + 5 = \mathbf{24}$  votes

D has  $14 + 6 + 13 + 5 = \mathbf{38}$  votes

D is the winner because it has the most votes

## Proportional Representation

Parties are given a # of seats depending on the % of votes

$$\frac{\text{\# of votes}}{\text{total votes}} \times \text{available seats}$$

Example in a voting region, there are 8 seats to be filled

Party	A	B	C	Total
# of Votes	10000	25000	12500	47500

Calculate the % of seats

Party A:

$$\frac{10000}{47500} = 0.21 \quad 0.21 \times 8 = 1.68$$

Party B:

$$\frac{25000}{47500} = 0.53 \quad 0.53 \times 8 = 4.24$$

Party C:

$$\frac{12500}{47500} = 0.26 \quad 0.26 \times 8 = 2.08$$

Party A is given 1 whole seat, Party B is given 4 whole seats and Party C is given 2 whole seats.

There is still one more seat to be given, therefore you look at the highest decimal left which would be 0.68 from Party A – who will be given the additional seat.