

Relative Frequency

How often something happens divided by all outcomes.

Example: if your team has won 9 games from a total of 12 games played:

- the Frequency of winning is 9
- the Relative Frequency of winning is $9/12 = 75\%$

Example: Travel Survey

92 people were asked how they got to work:

- 35 used a car
- 42 took public transport
- 8 rode a bicycle
- 7 walked

The Relative Frequencies (to 2 decimal places) are:

- Car: $35/92 = \mathbf{0.38}$
- Public Transport: $42/92 = \mathbf{0.46}$
- Bicycle: $8/92 = \mathbf{0.09}$
- Walking: $7/92 = \mathbf{0.08}$

$$0.38 + 0.46 + 0.09 + 0.08 = \mathbf{1.01}$$

(It would be exactly 1 if we had used perfect accuracy)

Relative Frequency

.) Sarah conducts an experiment & spins the spinner 20 times.

4	2	3	4	2	2	1	3	2	3
3	4	2	4	1	4	2	2	4	2

Score	1	2	3	4
Frequency				
Relative Frequency				

- Complete the table with frequencies & relative frequencies.
- What is the **theoretical** probability of the spinner landing on four?
- Do you think the spinner is **biased**? Explain why.

;) A dice is rolled 30 times. It lands on four 12 times.

- What is the relative frequency of the dice landing on four?
- Do you think the dice is biased? Explain why.

;) Toby spins the spinner 50 times and records his results.
Complete his table.

Score	1	2	3	4	5
Frequency	12	14	8		
Relative Frequency		0.2			0.16

- Sam rolls a biased dice 200 times.
He calculates that the relative frequency of scoring a six is 0.2
How many times did Sam roll a six during his experiment?
- Mack records the meals bought at lunch. 60 students buy a sandwich.
He calculated the relative frequency of a student buying a sandwich was 0.8 How many meals did Mack record?

6) Dan records his wins & losses playing online & compares his results with Alice's results.

Alice says she's the better player.
Do you agree?

Result	Dan		Alice	
	Win	Loss	Win	Loss
Frequency	13	7	66	54
Relative Frequency				

Over the next 40 games...
...how many games does Dan expect to win?
...how many games does Alice expect to win?

7) Ash records the speed that cars are driving on the road by his home that has a 30 mph speed limit.

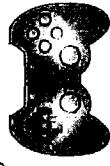
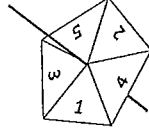
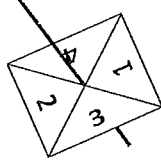
Speed (mph)	1-10	11-20	21-30	30+
Frequency	30		63	24
Relative Frequency	0.2	0.22		

- What is the probability the next car is breaking the law?
- What is the probability the next car is driving legally?
- 300 cars passed by his home over the next weekend.
Estimate how many were driving faster than 20 mph.

8) A factory records faults in the three types of robots it makes.

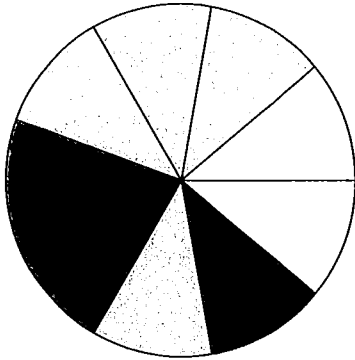
Robot	Type-A	Type-B	Type-C
Fault Relative Frequency		0.16	0.12

Type-A robots have 50% more faults compared to Type-B robots.
3 times the amount of Type-C robots are manufactured compared to Type-A robots & compared to Type-B robots.
What is the probability that the factory produces a faulty robot?





Use each diagram to solve the problems.



- 1) If you spun the spinner 1 time, what is the probability it would land on a gray piece?
- 2) If you spun the spinner 1 time, what is the probability it would land on a white piece?
- 3) How many pieces are there total in the spinner?
- 4) If you spun the spinner 1 time, what is the probability it would land on a black piece?
- 5) If you spun the spinner 1 time, what is the probability of landing on either a white piece or a gray piece?

Answers

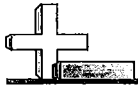
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

- 6) If you were to select 1 shape at random from the array, what is the probability it will be a heart?

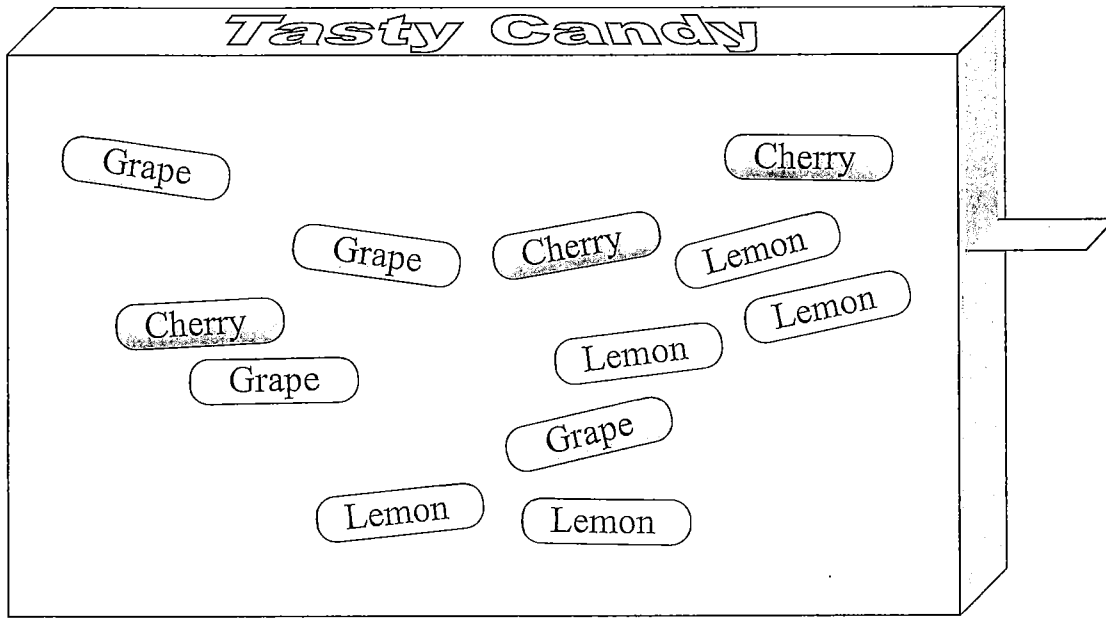
♡	♡	●	◇
♡	●	●	●
◇	●	♡	●
♡	●	♡	◇
♡	◇	●	●
- 7) How many shapes are there total in the array?
- 8) If you were to select 1 shape at random from the array, what shape do you have the greatest probability of selecting?
- 9) Which shape has a 0.35% chance (7 out of 20) of being selected?



- 10) If you were to roll the dice one time, what is the probability of it landing on an odd number?
- 11) If you were to roll the dice one time what is the probability it will NOT land on a 5?
- 12) If you were to roll the dice one time what is the probability it will land on a 5?



Use the candy box to solve each problem.



Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

- 1) How many total pieces of candy are in the box?
- 2) What is the probability of selecting a cherry piece?
- 3) What is the probability of selecting a lemon piece?
- 4) What is the probability of selecting a grape piece?
- 5) If you picked 1 piece of candy out of the box which flavor would you have the highest probability of selecting?
- 6) Which flavor has the lowest probability of being selected?
- 7) If you picked a piece at random would you be more likely to select, a lemon piece or a cherry piece?
- 8) What is the probability of selecting either a cherry piece OR a grape piece?
- 9) Your friend wants either a cherry piece or a grape piece. If you picked a piece out randomly, which one would you have the highest probability of selecting?
- 10) If you ate 3 lemon pieces, 3 cherry pieces and 4 grape pieces, which flavor would you have the highest probability of selecting next?