Topic

Probability

Objective

To set the idea of the probability of an event through a double colour card experiment.

Previous Knowledge Required

1. Sample space and event.
2. The total number of possible outcomes.
3. Favourable outcomes.
4. Probability of an event $= \frac{\text{No. of favourable outcomes}}{\text{Total no .of Possible outcome}}$

Material Required

Cardboard of size 18 cm × 18 cm, two colour papers say pink and blue, pair of dice, empty box, pair of scissors, sketch pens, fevicol, etc.

Procedure

1. Paste different colour papers, blue and pink on both sides of the board, (such that pink on one side and blue on another side)
2. Divide the board into 36 small, squared cards.
3. Write all 36 possible outcomes obtained by throwing two dice, e.g., for the outcome (4,5), write 4 on the blue side and 5 on the pink side.
4. Cut and put all the cards into a box.
5. Now take out each card one by one without replacement and write the observation in the appropriate column.

Observation

1. Total number of possible outcomes =
2. Total number of favourable outcomes of sum 2 =
3. Total number of favourable outcomes of sum 3 =
4. Total number of favourable outcomes of sum 4 =
5. Total number of favourable outcomes of sum 5=
6. Total number of favourable outcomes of sum 6 =
7. Total number of favourable outcomes of sum 7 =
8. Total number of favourable outcomes of sum 8 =
9. Total number of favourable outcomes of sum 9 =
10. Total number of favourable outcomes of sum 10 =

11. Total number of favourable outcomes of sum 11 =

12. Total number of favourable outcomes of sum 12 =

13. Total number of favourable outcomes (sum ≥11) =

14. Total number of favourable outcomes (sum >12) =

15. Total number of favourable outcomes (sum < 7) =

Using formula calculates the required Probability of each event. Sample space (when two dice are thrown)

(1,1)	(1,2)	(1,3)	(1,4)	(1,5)	(1,6)
(2,1)	(2,2)	(2,3)	(2,4)	(2,5)	(2,6)
(3,1)	(3,2)	(3,3)	(3,4)	(3,5)	(3,6)
(4,1)	(4,2)	(4,3)	(4,4)	(4,5)	(4,6)
(5,1)	(5,2)	(5,3)	(5,4)	(5,5)	(5,6)
(6,1)	(6,2)	(6,3)	(6,4)	(6,5)	(6,6)

Example: Number of favourable outcomes of the sum of two numbers = 1

Total outcomes = 36

∴ The probability of the sum of two numbers = $\frac{1}{36}$

Similarly, find other probabilities for different outcomes of the sum.

Result

Probability of an event = $\frac{\text{No. of favourable outcomes}}{\text{Total no .of Possible outcome}}$

Learning Outcome

The concept of finding the probability of an event is clear through this activity.

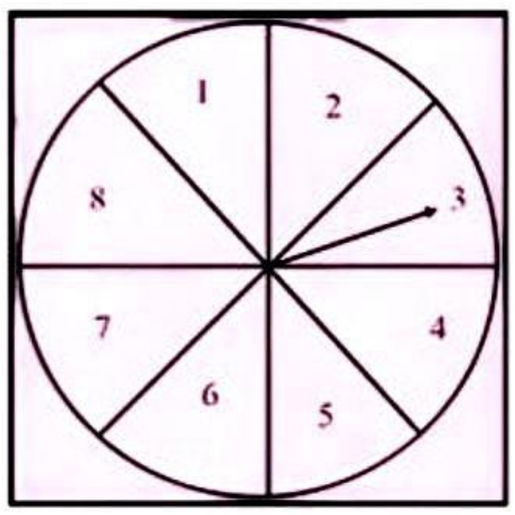
Activity Time

1. What is the probability of getting the sum of two numbers more than 17?

2. Write the sample space, when a coin is tossed 3 times.

3. A game of chance consists of spinning an arrow that comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 as shown in the fig. and these are equally likely outcomes. What is the probability that it will point at:

- 3?
- an odd number?
- a number greater than 2?
- a number less than 9?
- a number less than 1?



VIVA VOCE

Q 1. What is probability?

Ans. The possibility (or possibilities) of occurring or not occurring of an event is called probability.

Probability of an event = $\frac{\text{No. of favourable outcomes}}{\text{Total no .of Possible outcome}}$

Q 2. What is a sample space?

Ans. It is the set of all possible outcomes of a random experiment.

Q 3. What is the probability of an impossible event, sure event respectively?

Ans. Zero, one.

Q 4. A dice is thrown twice. How many elements are possible in sample space?

Ans. 36

Q 5. One card is drawn from a well-shuffled deck of 52 cards. What is the probability of a king of red colour?

Ans. $\frac{2}{52} = \frac{1}{26}$

MULTIPLE CHOICE QUESTIONS

Q 1. A dice is thrown twice. What is the probability that 5 will not come up either? (Hint: meaning is 5 is not coming in the first throw as well as in the second throw).

(a) $\frac{25}{36}$ (b) $\frac{17}{36}$ (c) $\frac{15}{36}$ (d) None of these

Q 2. 17 cards numbered 1, 2, 3, ... 17 are put in a box and mixed. One person draws a card. Find the probability that the number on the card is prime.

(a) $\frac{15}{17}$ (b) $\frac{7}{17}$ (c) $\frac{8}{17}$ (d) $\frac{9}{17}$

Q 3. The king, queen and jack of clubs are removed from a pack of 52 cards and then well shuffled. One card is selected from the remaining cards. Find the probability of getting 'The '10' of heart'.

(a) $\frac{1}{49}$ (b) 949 (c) 1049 (d) None of these

Q 4. A bag contains 5 red and some blue balls. If the probability of drawing a blue ball is double that of a red ball, find the number of blue balls in the bag.

(a) 10 (b) 5 (c) 20 (d) None of these

Q 5. A coin is tossed three times what is the probability of getting the same result in each trial?

(a) 14 (b) 18 (c) 38 (d) None of these

Answer Key

1.(a)	2.(b)	3.(c)	4.(a)	5.(a)