



XSEED

Foundation

GRADE

8

Maths

Content Book · VOLUME 2

- 21st Century Skills Development Focus
- Unique Problem Solving Approach
- Powered by the XSEED Method

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Probability

STRAND: Data Handling & Probability

11



Big Idea

Students will understand that when all outcomes of an experiment are equally likely, the theoretical probability of an event is the fraction of outcomes in which the event occurs.

What will we learn about in this chapter?

- Chance
- Theoretical Probability
- Experimental Probability

Approaching

Student can define chance.

Meeting

Student can define theoretical and experimental probability.

Exceeding

In addition, student can solve problems based on real-life application of probability principles.

B. Probability of taking out a blue ribbon roll = $\frac{1}{10}$

Example 4: Find the probability of rolling a six on a dice.

The sample space for rolling a dice gives 6 equally likely results: {1, 2, 3, 4, 5, 6}.

The probability of rolling a 6 is one out of 6 or $\frac{1}{6}$.

Remember: When the outcomes have an equal chance of occurring, the outcomes are called equally likely outcomes.

Experimental Probability

Every outcome of an experiment or collection of outcomes gives us the experimental probability of an event occurring. Experimental probability can help us make decisions.

At the shop, there are five different coloured sweaters—red, blue, white, green, and orange. If a customer is buying one sweater, there is a 1 in 5 chance of purchasing an orange sweater. However, if the shop manager notices that of a collection of 25 sweaters, 5 each of red, blue, white, green, and orange, during the last ten purchases, 2 red, 4 blue, 1 white, and 3 green sweaters were bought. We can then assume that orange is the least favourite of the colours, based on the actual purchase results.

More on Probability

When all the possible outcomes are equally likely, the probability of an event is the ratio of the number of favourable outcomes to the number of possible outcomes.

Did You Know?

A formal theory of probability was developed in the 1930s by the Russian mathematician AN Kolmogorov.

The probability of an event is written as $P(\text{event})$
$$= \frac{\text{Number of winning outcomes}}{\text{Total number of outcomes}}$$

We often make predictions in daily life. Hence, probability exists in daily life too.

1. We use probability to forecast the weather. We have a 1 in 2 chance that it will or won't rain on any given day. However, if over the course of the last week, it rained every day based on the actual outcomes, it is fair to assume that it will rain tomorrow. Hence, the theoretical probability is an equally likely chance of rain, whereas the experimental probability is a certain chance of rain.
2. We use probability to find conclusions related to characteristics of large groups by using a small group.

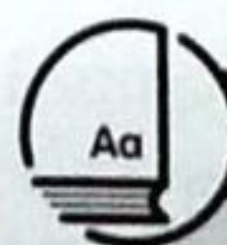
For example, the students of Grade 8 are asked to vote for their favourite teacher. The principal wants to do this quickly so he asks a few students randomly to vote and uses it to make the prediction about their favourite teacher.

Example 5: Find the probability of rolling a dice and getting an odd number.

Event **E**: rolling an odd number; outcomes in **E**: {1, 3, 5}

Sample space **S**: {1, 2, 3, 4, 5, 6}

The probability of getting an odd number is 3 out of 6 or $\frac{3}{6}$ or $\frac{1}{2}$.



Glossary

probability: the measure of how likely it is for an event to occur



Weblink

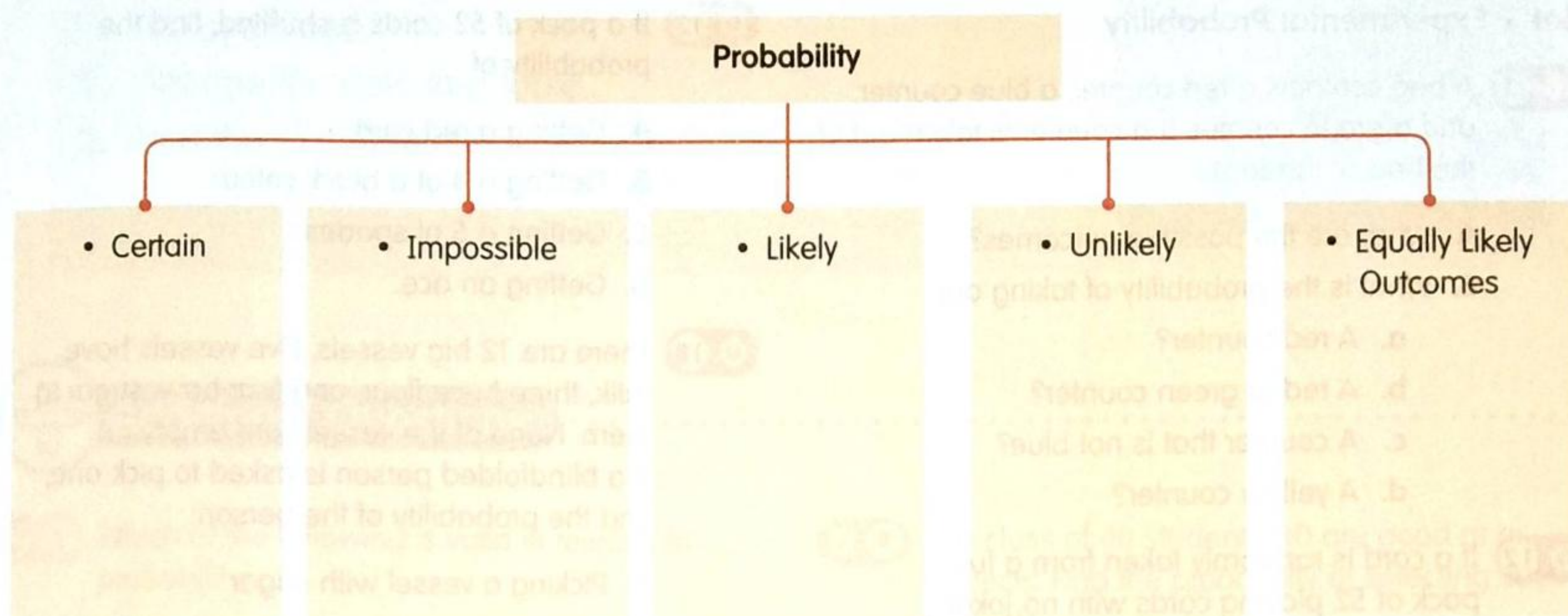
<https://www.teachingchannel.org/videos/teaching-probability-odds>

Use this website to watch a video on probability.



My Learning Chart

Write some scenarios and their possible outcomes.



Practice Questions

Set 1: Chance

- 1 Assuming that today is the 1st of July, tomorrow will be the 2nd of July. What is this an example of?
 - ☒ A. Certain event
 - ☐ B. Impossible event
 - ☐ C. Can't be predicted
 - ☐ D. None of these
- 2 Write whether *true* or *false*
 - A. When we roll a dice, we get any one number out of 1, 2, 3, 4, 5, or 6. These numbers are called outcomes.
 - B. A random experiment is one that can be predicted.
- 3 You have a bag with 6 identical balls of different colours (red, yellow, pink, blue, black, and green). If you pull out a ball without looking, what are the possible outcomes you would get?
- 4 When a dice is rolled, what are the six possible outcomes?

- HOTS** 5 List all the possible outcomes you would get:

- A. On rolling 2 dice together.
- B. On tossing 2 coins together.

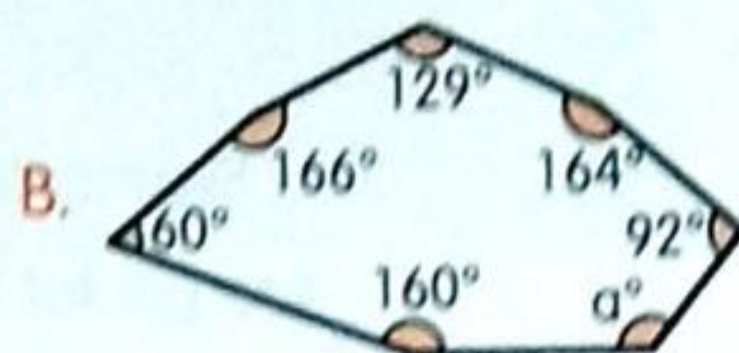
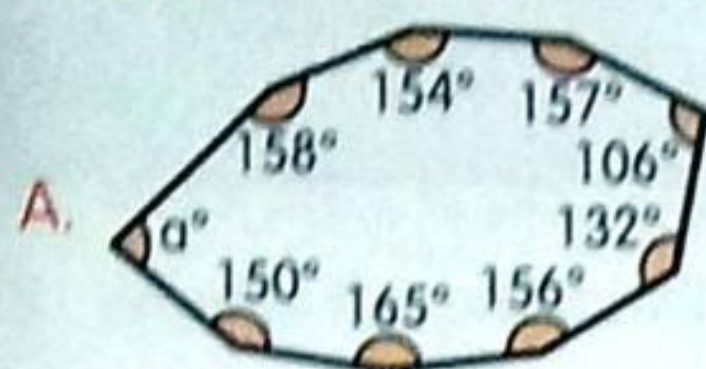
Set 2: Theoretical Probability

- 6 Fill in the blanks.
 - A. It is _____ that the entire class has taken leave on the same day.
 - B. It is _____ that the maths teacher will teach maths.
 - C. It is _____ that you will improve your conceptual understanding in various subjects.
 - D. It is _____ that you will start liking the subject which you dislike in a week.
- 7 Find all the possible equally likely outcomes when you roll a dice.
- 8 When a coin is tossed, what are the possible chances?
- HOTS** 9 If there are ten cards numbered 1 to 10 in a box, what are the possible chances that the card drawn will have a number less than 5?

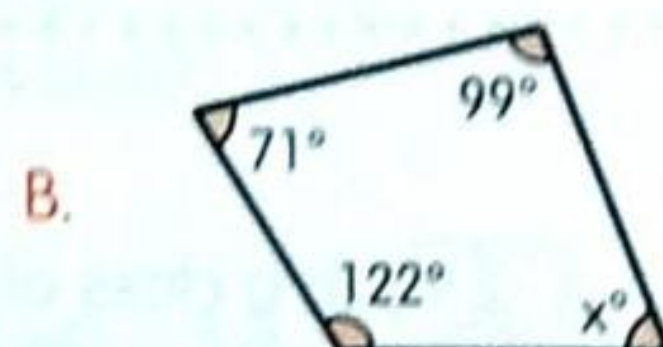
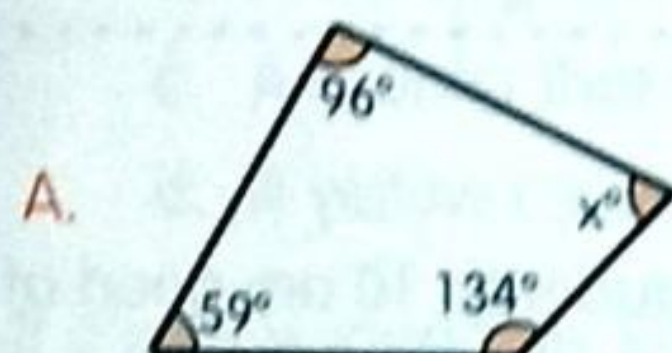


Revision Questions

1. A car travelled a certain distance at a speed of 55 km/hr on Monday. On Tuesday, it travelled for 10 more km than the distance travelled on Monday at a speed of 40 km/hr. If the car travelled for 5 hours in total on both days, find the distance travelled on each day.
2. Find the measure of $\angle a$ in each polygon.



3. Find the measure of $\angle x$ in each quadrilateral.



4. Find the measure of the missing angles in a parallelogram where one of the angles is given.
A. 157° B. 131°
5. Construct a quadrilateral DEFG with these measurements:
DE = 7 cm, EF = 3.5 cm, GF = 3 cm, DG = 5 cm, DF = 8 cm
6. Draw a double bar graph for the data in the table.

Favourite Colour	Number of Children in the First Colony	Number of Children in the Second Colony
Black	20	15
White	15	10
Red	25	30
Blue	15	20
Green	15	12
Any other	5	8

7. Sameer got the following outcomes when he rolled a dice 35 times:
5, 3, 4, 2, 6, 5, 4, 2, 2, 5, 6, 4, 5, 6, 1, 2, 1, 4, 6, 4, 3, 3, 3, 4, 1, 2, 4, 3, 5, 3, 2, 3, 4, 3, 4
Organise the data in a grouped frequency table.
8. Which statement is true for a circle graph?
A. The angles formed by all the sectors are equal.
B. The sum of the percentages of all the data sectors is 360° .
C. The sum of the angles formed by all the sectors is 360° .
D. The sum of the angles formed by all the sectors is 100° .

Squares of Numbers

STRAND: Numbers & Operations

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Big Idea

Students will understand that square numbers are those that can be expressed as the product of a number with itself.

What will we learn about in this chapter?

- The Square of a Number
- Properties of Square Numbers
- Patterns in Square Numbers

Approaching

Student can multiply a number by itself.

Meeting

Student can test whether a number is a perfect square.

Exceeding

In addition, student can identify patterns within squared numbers.