CHAPTER: Data Handling

Grade: **8**
Board: **CBSE**
Book: **NCERT**

1.

Chapter Summary and Placement

<Read through the following to understand how this chapter is connected with the previous and next grades and also the important concepts covered in it.>

1. This chapter connects to the chapter Data handling of Grade 7
2. Here it deals with histogram, pie chart and calculating probability of the events
3. It connects to statistics chapters of higher grades

2.

LEARNING OUTCOMES

<On completion of the chapter, students will be able to:>

1. Recap definitions related to data handling
2. Acquires the knowledge of class intervals and it’s types
3. Draw histogram
4. Draw pie chart
5. Solve questions related to probability

4. TEACHING PLAN

Follow this section for getting ideas on teaching the content covered in the chapter. The subtopic given in the first column with the matching learning outcome can be explained using instructions and resources listed subsequently

Subtopic and Learning Objective #1

Subtopic:Definitions
LO
:Recap definitions related to data handling
1.To make the student recollect the definitions that were learnt in grade 7

Teacher Activity

Do a recap of definitions with enough examples
Use Resource 1 for reference

Check for understanding:

a) What is data?
b) How a data can be represented?
c) Is the pictograph best method of representing all kinds of data?
d) What are demerits of pictograph?
e) What is raw data?

Resources Suggested

Blackboard, pen and paper
Resource 1 for reference

Resource 1

Statistics: The science which deals with the collection, presentation, analysis and interpretation of numerical data.
Data Handling: Deals with the process of collecting data, presenting it and getting result.
Data: Data is a collection of information gathered by observation, questioning or measurement.
Data mostly available to us in an unorganised form is called raw data.
It could be the marks of a student in whole academic year, shopping done in an year, Height and weight of the students, Number of child births and their gender and so on
In order to draw meaningful inferences from any data, we need to organise the data systematically.
Organising data : To get a particular information from the given data quickly, the data can be arranged as per requirement is called organisation of data.

Resource 1

Eg: The marks scored out of 50 in a math exam taken by 16 students are as follows:

26,15, 40, 18, 26, 24, 48, 40, 39, 26, 23, 37, 38, 40, 45, 48. [Raw data]

15, 18, 23, 24, 26, 26, 26, 37, 38, 39, 40, 40, 40, 45, 48, 48. [Data organised in ascending order]

Array: Arranging raw data in ascending or descending order of magnitude.

Representation of data: Data is represented in many forms for easy accessibility and readability. Some of them are as follows

Pictographs, pie charts, Bar graphs, line graphs and so on

Observation: Each entry (number) in raw data.

Range: The difference between the lowest and the highest observation in a given data.

Frequency: Frequency gives the number of times that a particular entry occurs.

Raw data can be ‘grouped’ and presented systematically through ‘grouped frequency distribution’.

Example of frequency distribution table:

For example, in a class if there are 15 students and their favorite subjects are Maths, English, Maths, Science, English, Maths, Hindi, Hindi, Maths, English, Maths, English, Maths, Hindi, Maths. Frequency distribution table can be drawn as:

Resource 1

Subject	Tally Marks	Number of Students (Frequency)
Maths	𝍸 ||	7
English	||||	4
Science	|	1
Hindi	|||	3

Resource 1

Frequency: The number of times a particular observation occurs in the given data.

Class Interval: A group in which the raw data is condensed.

(i) Continuous: The upper limit of a class interval coincides with the lower limit of the next class.

Eg: 10-20; 20-30; 30-40…….

(ii) Discontinuous: The upper limit of a class interval does not coincide with the lower limit of the next class.

Eg.: 1-10; 11-20; 21-30; 31-40……..

Class Limits: Each class in a bounded by two figures which are called class limits.

(i) Upper Class Limit: The upper value of a class interval.

(ii) Lower Class Limit: The lower value of a class interval.

Class Size or width: The difference between the upper class limit and lower class limit of a class.

Class Mark: The mid-value of a class-interval. Class mark=upper limit+lower limit/2

Graphic representation of data:

(i) Pictograph: Pictorial representation of data using symbols.

(ii) Bar Graph: A display of information using bars of uniform width, their heights proportional to the respective values.

Subtopic and Learning Objective #2

Sub topic:Types of class intervals
LO:
Acquires the knowledge of class intervals and its types
1. To make student understand types of class intervals

Teacher Activity

Introduce types of class intervals
Resource 1 for reference

Check for understanding:

a) Give an example of continuous class interval

b) Represent the following data by grouping using class intervals

830, 835, 890, 810, 835, 836, 869, 845, 898, 890, 820, 860, 832, 833, 855, 845, 804, 808, 812, 840, 885, 835, 835, 836, 878, 840, 868, 890, 806, 840.

c) Classify the types of class intervals[types of class intervals is of teachers choice]

Resources Suggested

Blackboard, pen and paper
Resource 1 for reference

Subtopic and Learning Objective #3

Sub topic:Histogram
LO:
Draw histogram
1. To make student draw histograms to the given data/ read histograms and answer the questions

Teacher Activity

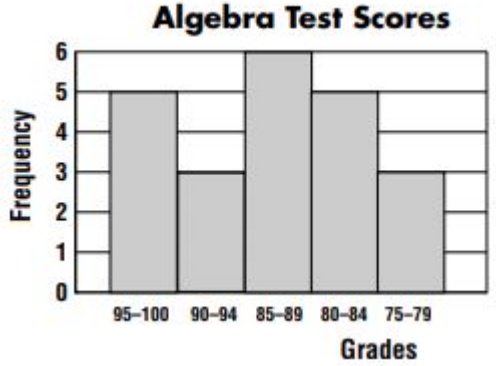
Introduce histograms and method of reading them
Resource 2 for reference
Carry out **Activity 1**

Check for understanding:

a) Construct a histogram to represent the following data. The number of hours of television watched in a week: 2, 2, 2, 3, 3.5, 3.5, 4, 4, 5.5, 5.5, 5.5, 6, 8, 8.5, 8.5, 8.5, 8.5, 8.5, 8.5, 9, 9, 9, 9.5, 12.5

b) Answer the questions followed by the histogram:

Teacher Activity



How many students took the algebra test?
Which grade has the most test scores?
Which grades have the same number of test scores?
How many more students earned 85–89 than earned 80–84?

Resources Suggested

Blackboard, pen and paper
Resource 2 for reference

Activity 1

Name of the activity- choice of grade 8 students
Type of activity – Individual
Use it for – practice
Materials – Pen and papers, graph paper
Procedure:

1. Ask students to collect data from other students of class.
2. Data can be related to marks in a subject/ height of students/weight of the students
3. Represent the data in distribution table and draw a histogram

Subtopic and Learning Objective #4

Sub topic:Pie chart / circle chart
LO:
Draw pie chart
1. To make student draw pie charts to the given data/ read pie charts and answer the questions

Teacher Activity

Introduce pie charts and method of reading them
Resource 3 for reference
Carry out Activity 2

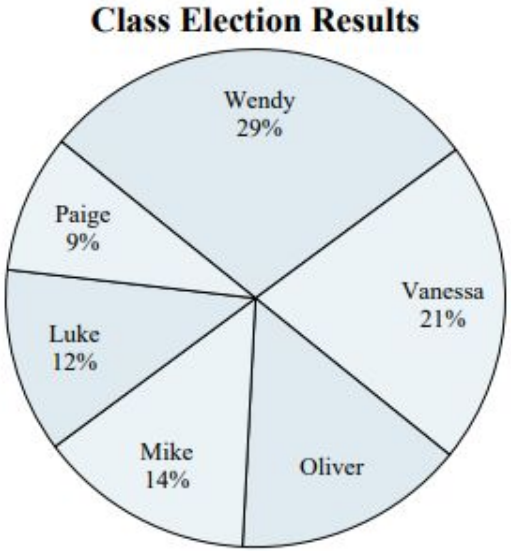
Check for understanding:

a) Various modes of transport used by 1260 students in a given school are given below:
Represent the data in pie chart

School Bus	Private Bus	Bicycle	Rickshaw	On foot
350	245	210	175	280

B Read the following pie chart and answer the questions given below

Teacher Activity



Who won the election?
Who got the least number of votes?
What percent of people voted for Oliver?
What percent of people voted for either Luke or Oliver?
Which two candidates had about half the votes?

Resources Suggested

Blackboard, pen and paper
Resource 3 for reference

Activity 2

Name of the activity- choice of grade 8 students
Type of activity – Individual
Use it for – practice
Materials – Pen and papers, geometry instrument box
Procedure:

1. Ask students to pick an item and collect data from other students of class
2. Choice of items can be : food, games, types of movie, cartoon show, favourite fruits
3. Under each head take three varieties. If food is chosen then three food items has to be taken
1. Represent the data in table with central angles and draw pie chart

Resource 3

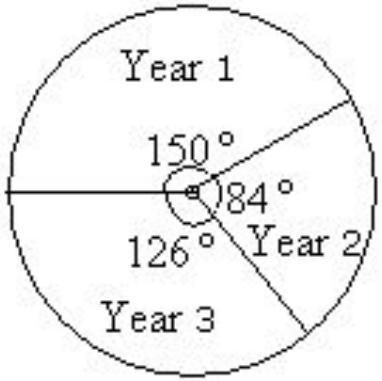
1. **Pie chart or circle graph:**
2. Data can also presented using circle graph or pie chart.
3. A circle graph shows the relationship between a whole and its part.
4. **Examples:**
5. In a school, there are 750 students in Year 1, 420 students in Year 2 and 630 students in Year 3. Draw a circle graph to represent the numbers of students in these groups.
6. ***Solution:***
7. Total number of students = 750 + 420 + 630 = 1,800.

$$\text{Year 1: size of angle} = \frac{750}{1800} \times 360° = 150°$$

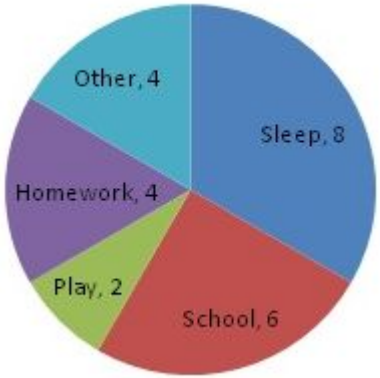
$$\text{Year 2: size of angle} = \frac{420}{1800} \times 360° = 84°$$

$$\text{Year 3: size of angle} = \frac{630}{1800} \times 360° = 126°$$

Resource 3



Read the below pie graph which represents a daily routine of a student.Analyse it and frame questions with answers



Resource 3

1. How many hours were spent in other activities?
   4 hours
2. How much time is taken to complete homework?
   4 hours
3. How many hours did he play?
   2 hours
4. His sleeping duration is 4 hours
5. How many hours were spent in school?
   6 hours

Subtopic and Learning Objective #1

Sub topic:Probability
LO:
Solve questions related to probability
1. To make student understand meaning and terms related to probability

Teacher Activity

Introduce probability and terms related to it

Resource 4 for reference

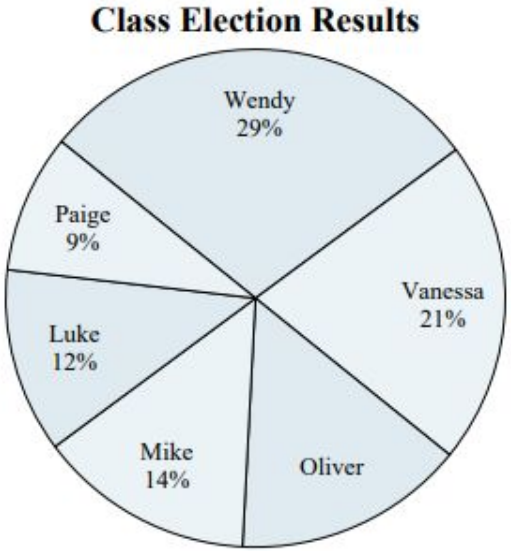
Check for understanding:

a) There are 4 purple balls, 7 white balls, and 11 green color balls in a bag. What is the probability of picking up one white ball out of the bag without looking?

b) A coin is tossed times and it is found that head comes up times and tail times. If a coin is tossed at random, what is the probability of getting a tail?

c) What is the probability of getting a number less than 5 while rolling a dice?

Teacher Activity



Who won the election?
Who got the least number of votes?
What percent of people voted for Oliver?
What percent of people voted for either Luke or Oliver?
Which two candidates had about half the votes?

Resources Suggested

Blackboard, pen and paper
Resource 4 for reference

Resource 4

There are certain experiments whose outcomes have an equal chance of occurring.
Eg: If a coin is tossed chance of coming head
A random experiment is one whose outcome cannot be predicted exactly in advance.
Eg: If a coin is tossed chance of coming head or tail
Outcomes of an experiment are equally likely if each has the same chance of occurring as given in above example.
Experiment: An operation which can produce some well-defined outcomes.
Trial: The performance of an experiment.
Random Experiment: An experiment in which all possible outcomes are known and the exact outcome cannot be predicted in advance.
Equally Likely Outcomes: Certain experiments whose outcomes have an equal chance of occurring.
Event: Each outcome of an experiment or a collection of outcomes is called an event.
Chances and probability are related to real life.
Probability: The chance of occurring of a certain event when measured quantitatively.

Resource 4

Probability of an event =number of outcomes that makes an event/ total number of outcomes. when the outcomes are equally likely.

Example:

When a die is thrown which is marked as 1,2,3,4,5 and 6 on each face

The probability of getting 5 is 1/6

The probability of getting a number greater than 6 is 0/6

Probability of getting even numbers is 3/6 = 1/2

5. WORKSHEETS

Print or copy the worksheet questions on the blackboard and ask the students to attempt them. They can be given as homework or a class test as well.

Worksheet 1

Use it like: test after the chapter is complete, homework

Answer the following:

1. The heights (in cm) of 22 students were recorded as under:

Prepare a frequency distribution table, taking equal class intervals and starting from 125-130, where 130 is not included.

125, 132, 138, 144, 142, 136, 134, 125, 135, 130, 126, 132, 135, 142, 143, 128, 126, 136, 135, 130, 130, 133

2. The frequency distribution of weights (in kg) of 40 persons is given below

Weights (in kg)	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55
Frequency	6	13	14	4	3

Worksheet 2

Use it like: test after the chapter is complete, homework

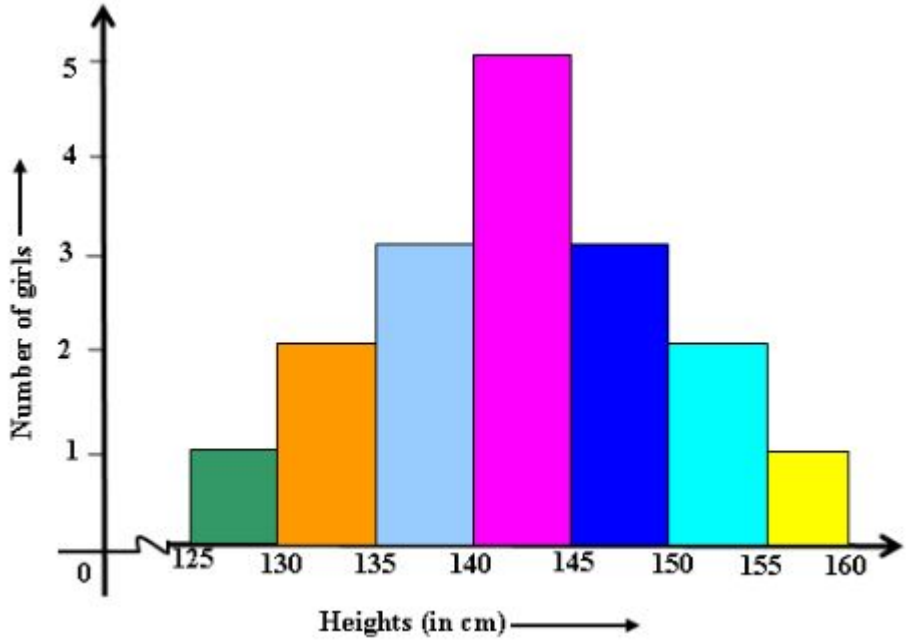
Answer the following:

1. List given below was made by a researcher to record the number of bacteria in each sample slide. Draw a histogram for the data

4,1,22,33,43,52,4,11,22,34,43,53,5,12,22,34,44,53,38,5,12,23,35,44,53,5,13,23,36,45,54,6,14,24,36,45,57,58,6,15,24,37,45,57,7,15,28,37,46,57,8,16,38,58,9,18,19,39

2. Read the following histogram and the following questions:

Worksheet 2



a) What information is depicted in histogram?
b) Which group contains maximum number of girls?
c) Which groups contain same number of girls?
d) Heights of how many girls are 145 cm and more?
e) How many girls are surveyed?

Worksheet 3

Use it like: test after the chapter is complete, homework

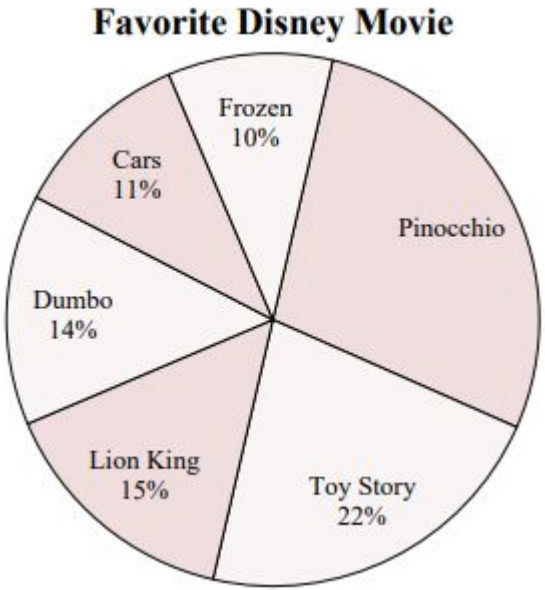
Answer the following:

1. Draw a pie chart showing the following information of choice of colours in a group of people.

Colours	Number of people
Blue	18
Green	9
Red	6
Yellow	3

Worksheet 3

1. Read the following pie chart and answer the following questions



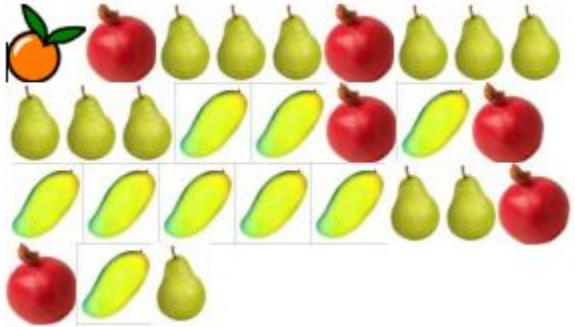
   a) Which movie was the most popular?
   b) Which movie was the least popular?
   c) What percent of people said Pinocchio was their favorite?
   d) What percent of people said either Pinocchio or Cars was their favorite?
   e) Which two movies did about half the people say was their favorite

Worksheet 4

Use it like: test after the chapter is complete, homework

Answer the following:

1. Radha was getting late for her match. While running out the door, she picks up a fruit from the fruit basket which had the following fruits. What is the probability that Radha did not pick a pomegranate?



Worksheet 4

1. If a die is thrown, what is the probability of getting an odd number?
2. There are 4 purple balls, 7 white balls, and 11 green color balls in a bag. What is the probability of picking up one white ball out of the bag without looking?
3. A coin is tossed 200 times and head appeared 120 times. Find the probability of getting a tail in this experiment?
4. If you have a spinning wheel with 3 green sectors, 1 blue sector and 1 red sector what is the probability of getting a green sector and what is the probability of getting non blue sector?

6. SOLUTIONS

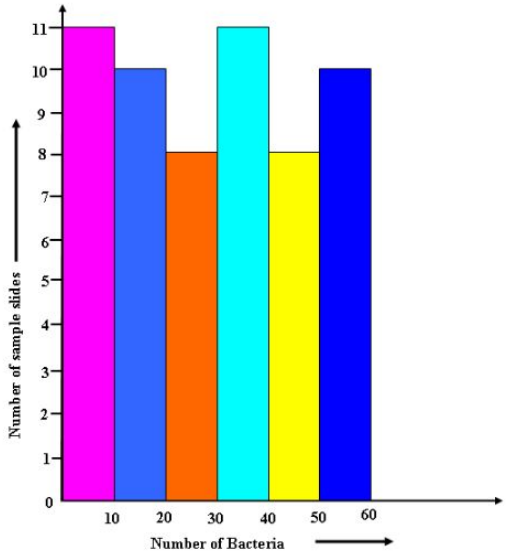
This section gives you sample answers for activities and questions listed above.

Worksheet 1

Height in cm	frequency
125-130	5
130-135	7
135-140	6
140-145	4

2. a) 45 (b) 5 (c) 40 - 45 (d) 50 - 55

Worksheet 2



a) The histogram depicts heights of girls in a group

b) 140-145

c) Number of girls in following groups are equal

125 - 130; 155 - 160

130-135 ; 150-155

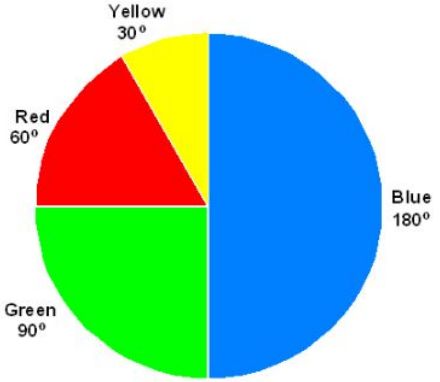
135-140; 145-150

d) Number of girls whose height is 145 cm and more is 6

e) Total number of girls surveyed 17

Worksheet 3

Colours	No. of People	In Fractions	Central Angle
Blue	18	$\frac{18}{36}=\frac{1}{2}$	$\frac{1}{2}\times 360^\circ = 180^\circ$
Green	9	$\frac{9}{36}=\frac{1}{4}$	$\frac{1}{4}\times 360^\circ = 90^\circ$
Red	6	$\frac{6}{36}=\frac{1}{6}$	$\frac{1}{6}\times 360^\circ = 60^\circ$
Yellow	3	$\frac{3}{36}=\frac{1}{12}$	$\frac{1}{12}\times 360^\circ = 30^\circ$



Worksheet 4

1. 22/28
2. 1/2
3. 7/22
4. 2/5
5. Total number of sectors=5; green sector=3/5,non blue sector=4/5

7. EXTRA RESOURCES

Carry out the following suggested activities/ tasks if you have the time and resources to do them

Teacher can use these videos if time and facilities permit:

1. https://www.youtube.com/watch?v=GwNO0Af1dW8 - probability