

## Organizing Data

**Level:** Key Stage 3

**Dimension:** Data Handling

**Module:** Organization and Representation of data

**Unit:** Introduction to various stages of statistics

**Student ability:** Average

### Content Objectives:

After completing the activity, students should have a better understanding of how to organize data into groups.

### Language Objectives:

After completing the activity, students should be able to

- recognize and pronounce the English key words used in statistics (e.g., *data, tally, frequency, total, groups, range, and width*);
- understand and state in English the basic principles for grouping data, e.g.,
  - *The number of groups should not be too small or too large.*
  - *The widths of the groups should be the same.*
  - *All the data should be included in the groups.*
  - *Even though the frequency of a group is zero, we have to keep the group.*
- understand and state in English the problems of group data into a very small number of groups or a very large number of groups (e.g., *We cannot see the trend / We cannot get meaningful information if the number of groups are too small or too large.*); and
- follow English instructions on solving problems concerning this topic and work on related problems written in English.

**Prerequisite knowledge:** Nil

**Time:** 2 lessons (2 x 40 minutes)

**Procedure:**

1. The teacher should introduce the terms “tally” and “frequency” by asking students to indicate the number of siblings they have.
2. The teacher should then put the students into groups of 4 and distribute the worksheets to them.
3. Using the data from set A, the teacher should then ask the students to complete table 1 individually and, working with their group members, to complete tables 2-4.
4. The teacher should then encourage students to report their findings to the whole class.
5. Sufficient time should be allowed for group discussion of the follow-up questions.
6. The teacher should then ask the group representatives to present their answers to the questions.
7. By using the follow-up questions, the teacher should guide students to discuss the problem of each table and the skills of organizing data.
8. The teacher should give students some time to write down the basic principles for organizing data, then guide the students to finish the task.
9. Then the teacher should ask students to complete the frequency distribution table using data set B. At the same time, the teacher should remind the students to think about the prompting questions before they start to draw the table.
10. Finally, the teacher should walk around to give support to the students when they are constructing the frequency distribution table.

### Explanatory Notes for Teachers:

1. When teaching the terms “tally” and “frequency”, the teacher can draw the following table and ask the students to come out and draw a line. Then the teacher can introduce the concept of “tally” and that the number of students is called the “frequency”.

Most favourite fruit	Tally	Number
Apple		
Orange		
Banana		
Mango		
Others		

2. When students are trying to write down the basic principles for organizing data, the teacher should give more language support to students, e.g. provide useful English words to help students express the concepts.
3. The teacher may explain to the students that in general, the widths of the groups are the same, but there are also exceptions like the following example:

In a survey on the number of children in a family, the groups may be like “0”, “1”, “2”, ..., “9” and “10 or above”.

## Statistics – Organizing Data (Lesson 1)

Name: \_\_\_\_\_

Class: \_\_\_\_\_ (    )

### Data set A:

Weight of 40 students (in kg)

36	40.5	45	55.4	60	37	42	51
41.5	50.9	39.5	39.8	50.6	42.4	43	53
50.7	38	57.5	44.5	43.5	40	43	54.5
56	39	44.1	44	52	55.3	55	51
59.8	57	59	50.6	58	53.4	57	54

Task 1:

Put the data into 2 groups (Table 1):

Weight (in kg)	Tally	Frequency
1-50		
51-100		
<b>Total=</b>		

Task 2:

Put the data into 5 groups (Table 2):

Weight (in kg)	Tally	Frequency
36-40		
41-45		
46-50		
51-55		
56-60		
<b>Total=</b>		

Task 3:

Put the data into 6 groups (Table 3):

Weight (in kg)	Tally	Frequency
31-37		
38-40		
41-45		
46-52		
53-55		
56-60		
Total=		

Task 4:

Put the data into 10 groups (Table 4):

Weight (in kg)	Tally	Frequency
30-32		
33-35		
36-38		
39-41		
42-44		
45-47		
48-50		
51-53		
54-56		
57-59		
Total=		

From your classmates' work, discuss the following questions about organizing data:

1) If the frequency is zero in a group, can we omit the group?

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2) Can we ignore the data if they cannot fit into any one of the groups?

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3) Is it fair for the groups to have different widths?

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4) What is the problem if the number of groups is too small?

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5) What is the problem if the number of groups is too large?

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From the above answers and your own observations, what are the basic principles for grouping data?

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Suggested Answers

Task 1:

Put the data into 2 groups (Table 1):

Weight (in kg)	Tally	Frequency
1-50	//// //// //// ///	18
51-100	//// //// //// //// //	22
Total=		40

Task 2:

Put the data into 5 groups (Table 2):

Weight (in kg)	Tally	Frequency
36-40	//// //	7
41-45	//// //// /	11
46-50		0
51-55	//// //// ////	14
56-60	//// ///	8
Total=		40

Task 3:

Put the data into 6 groups (Table 3):

Weight (in kg)	Tally	Frequency
31-37	//	2
38-40	////	5
41-45	//// //// /	11
46-52	//// ///	8
53-55	//// /	6
56-60	//// ///	8

Total=	40
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Task 4:

Put the data into 10 groups (Table 4):

Weight (in kg)	Tally	Frequency
30-32		0
33-35		0
36-38	///	3
39-41	////	5
42-44	//// ///	8
45-47	//	2
48-50		0
51-53	//// ////	9
54-56	//// /	6
57-59	////	5
Total=		38

- 1) No
- 2) No
- 3) Not fair / unfair
- 4) We cannot see the trend / no meaningful information
- 5) We cannot see the trend / no meaningful information

*Basic principles for grouping data:*

1. The number of groups should not be too small or too large.
2. The widths of the groups should be the same.
3. All the data should be included in the groups.
4. Even though the frequency of a group is zero, we have to keep the group.

Frequency distribution table for data set B:

Height (cm)	Tally	Frequency
131-138	///	3
139-146	#### ////	9
147-154	#### ###	10
155-162	#### ////	14
163-170	////	4
		40