



## **Exemplar 1 :** **Time to Take Off**

**Objectives:** To construct and interpret histograms by using data obtained from the Internet

**Learning Unit:** Construction and Interpretation of Simple Diagrams and Graphs

**Key Stage :** 3

**Materials Required:** *Internet and Excel*

**Pre-requisite Knowledge:** Construction of histograms

### **Description of the Activity:**

1. To arouse students' interest, the teacher begins the activity by asking questions about the Hong Kong International Airport and/or aeroplanes.
2. The teacher asks students to visit the web site of the Flight Information of the Hong Kong International Airport at :  
*[http://www.hkairport.com/eng/flight\\_info/FlightInfoFrame.jsp](http://www.hkairport.com/eng/flight_info/FlightInfoFrame.jsp).*  
The teacher allows some time for students to browse the web site to have an idea of the flight information.
3. Students find the schedules of departing flights from the Airport for a date specified by the teacher.
4. Students collect the following data from the web site:
  - (a) number of flights taking off from the Airport in each hour,
  - (b) number of flights delayed in taking off from the Airport in each hour.

5. Students complete Table 1 in the worksheet.
6. Students use the information in the table to answer the questions in the worksheet and then use *Excel* to draw histograms on the number of flights taking off and the number of flights delayed in each hour.
7. Discussions can be held among the groups in answering Question 6 for comparing the two histograms.
8. To stimulate further discussion, the teacher can ask students whether there are other types of graphs to represent these data.

## ***Worksheet : Time to Take Off***

Use the information on the web site of the Flight Information of the Hong Kong International Airport at [http://www.hkairport.com/eng/flight\\_info/FlightInfoFrame.jsp](http://www.hkairport.com/eng/flight_info/FlightInfoFrame.jsp) to answer the following questions.

1. Use the information of flight departures on       (day)/      (month)/      (year) to complete the following table:

Time Interval	Number of flights taking off	Number of flights delayed
7:00 a.m. – 7:59 a.m.		
8:00 a.m. – 8:59 a.m.		
9:00 a.m. – 9:59 a.m.		
10:00 a.m. – 10:59 a.m.		
11:00 a.m. – 11:59 a.m.		
12:00 p.m. – 12:59 p.m.		
1:00 p.m. – 1:59 p.m.		
2:00 p.m. – 2:59 p.m.		
3:00 p.m. – 3:59 p.m.		
4:00 p.m. – 4:59 p.m.		
5:00 p.m. – 5:59 p.m.		
6:00 p.m. – 6:59 p.m.		
7:00 p.m. – 7:59 p.m.		
8:00 p.m. – 8:59 p.m.		
9:00 p.m. – 9:59 p.m.		
10:00 p.m. – 10:59 p.m.		
11:00 p.m. – 11:59 p.m.		

Table 1

2. From Table 1,
- (a) what is the time interval with the highest number of departing flights?
  - (b) what is the number of flight taking off in this interval?
  - (c) what is the number of flights delayed in this interval?
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
3. From Table 1,
- (a) what is the time interval with the lowest number of departing flights?
  - (b) what is the number of flight taking off in this time interval?
  - (c) what is the number of flights delayed in this interval?
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
4. Is there any relation between the number of flights taking off and the number of flights delayed in the two time intervals of Questions 2 and 3? Explain briefly.
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
5. Use *Excel* to draw
- (a) a histogram representing the number of flights taking off in Table 1, and
  - (b) a histogram representing the number of flights delayed in Table 1.

6. Compare the two histograms drawn in Question 5. Is there any relation between the number of flights taking off and the number of flights delayed in other time intervals? In which time interval is the relation more significant?

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7. (For more able students)

Can you give some factors that may cause the flights to delay in departure?

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**Notes for Teachers:**

1. The web site contains information of flight departures for a limited period of time only. Therefore, the teacher should check that the information for the date specified still exists on the web site before the activity.
2. In this exemplar, the departure time is used. As an alternative, the teacher can ask students to use the arrival time instead. Or, the departure time or arrival time of certain airlines can be investigated to see if they are punctual or not.
3. Apart from investigating the time of departure or arrival, the number of in-bound flights or out-bound flights can also be used for investigation. In addition, flight information of other airports can be used for investigation, e.g. Incheon International Airport of South Korea ([www.airport.or.kr/intro.htm](http://www.airport.or.kr/intro.htm)).
4. The teacher should point out that the Hong Kong International Airport operates 24 hours a day, but there are too few flights from midnight to 7 a.m. Thus, the flights in this period are not considered in the investigation.
5. The teacher should remind students that they ought to use the same type of aircrafts for investigation. The data for passenger flights are used in this exemplar only. Data for cargo flights should not be included.
6. The teacher could ask students to work in pairs if they are not familiar with searching on the Internet. When working in a pair, one student could search the data and the other could do the recording. It may help to reduce fatigue as the web site contains all the flight data of the day. Pair work could also help to develop students' collaborative skills.