Data sheet Calendar

The Gregorian Calendar

The most widely used calendar in the world is the Gregorian Calendar (which is the one we use in Britain for most purposes).

One year is the time it takes the Earth to go around the Sun. The basis of the Gregorian Calendar is that the year is then divided up into 365 days. These 365 days are grouped into 12 months, which vary in size from 28 days to 31 days, as shown in this table:

month	days
January	31
February	28/29
March	31
April	30
May	31
June	30
July	31
August	31
September	30
October	31
November	30
December	31

The year is also divided into 52 weeks of seven days each. However, 52 x 7 = 364, so the year has 52 weeks and one day in it. This means each year of 365 days results in the dates 'moving on' a day. For example,

in 2006 January 1st was on a Sunday;
in 2007 it was on a Monday;
in 2008 it will be on a Tuesday.

More problems

The time the Earth takes to go around the Sun is not exactly 365 days. It varies a little from year to year, but it averages out to 365.24219 days (approximately). This is close to 365¼ (365.25) days. This means that each year, the calendar is about a quarter of a day short, so over four years, the calendar is a whole day short. An extra day is put into the calendar every four years, to make up for the missing '¼ days' that have built up. This is the 'leap year', when there is a February 29th

inserted in the calendar. A rule has been invented for this: leap years are when the year number divides by 4. So 2004 was a leap year and 2008 will also be one.

...and more problems

There are still small problems with this, however. The Earth does not take exactly $365\frac{1}{4}$ days to go around the Sun. The difference between the average of 365.24219 and 365.25 is 0.00781. This means that over 100 years there will build up an error in the calendar of 0.781 days (= 0.00781 x 100), which is about $\frac{3}{4}$ of a day. Over 400 years this will be about 3 days. In other words, over 400 years, the calendar will have 3 days too many in it.

The rule to deal with this is that at the turn of each century, the century year, for example, 1800 or 1900, is not a leap year (although it ought to be according to the previous rule, because the year number divides by 4). But this would mean the removal of 4 days over 400 years, when only 3 days need to be removed. The rule is therefore adjusted slightly and only the century years which divide by 400 are left as leap years. This meant that the year 2000 was a leap year (because 2000 divides by 400), but 1900 was not a leap year (because 1900 does not divide by 400).

Questions Calendar

1

Which of the years from 1965 to 1975 were leap years?

2

In a 365-day year, what is the date of the day that is the exact middle of the year?

3

Explain why 1600 was a leap year, but 1700 was not.

4

2004 was a leap year and May 1st was on a Saturday.

(a) Complete this table to show the days on which May 1st occurred.

May 1st	2002	2003	2004	2005	2006
			Saturday		

(b) In which year is May 1st next on a Saturday after 2004 ?

5

A quarter of a year is ‘three months’ and a quarter of 52 weeks is 13 weeks.

Find three consecutive months in the year that are exactly 13 weeks.
