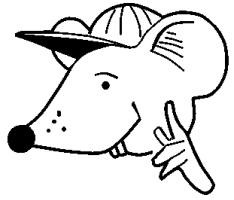




MATHEMATICS



N.S. Yr. 6 P.99

**Vocabulary of time.
Estimating and measuring time.**

Equipment

Pencil, paper.

MathSphere

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Concepts

Children should understand and be able to use the following vocabulary:

Sunday to Saturday, January to December, Spring to Winter.

Day, week, fortnight, month, season, year, leap year, century, millennium, morning, afternoon, evening, night, midnight, noon, hour, minute, second, today, yesterday, tomorrow, weekend, a.m., p.m.,

how long ago, how long will it be to, arrive, depart, faster, fastest, slower, slowest, takes less time, earliest, latest.

Digital clock, analogue clock, 24 hour clock, 12 hour clock

Greenwich Mean Time, British Summer Time

Children should know the main units of time and how they relate to other units:

1 millennium	= 1 000 years
1 century	= 100 years
1 year	= 12 months or 52 weeks or 365 days
1 leap year	= 366 days
1 week	= 7 days
1 day	= 24 hours
1 hour	= 60 minutes
1 minute	= 60 seconds

They should know and be able to apply the rhyme:

30 days hath September

April, June and November.

All the rest have 31,

Except February alone,

Which has but 28 days clear

And 29 in each leap year.

Children should be familiar with all the concepts and practices in the two previous modules (4098 and 5099). The only new idea in this module is that of standard time around the world - GMT and BST.

Greenwich Mean Time

Greenwich Mean Time is the time at Greenwich in London.

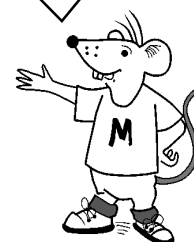
It is calculated from the position of the Sun over Greenwich and so may be called 'Sun Time at Greenwich'. **

When the Sun is due south at Greenwich, the time is 12 noon Greenwich Mean Time. Greenwich Mean Time is often abbreviated to GMT.

Did you know Greenwich Mean Time is also called 'Zulu Time'?



No, but I did know that scientists such as astronomers call it 'Universal Time' or U.T.



Greenwich Mean Time gives us a standard time that everyone can refer to, no matter what their local time.

For example, if two astronomers saw a new comet in the sky on the same night and one lived in Japan and the other on the east coast of the United States, they could work out who saw it first by converting the time in Japan and the time in the US to GMT.

Japanese time is **8 hours ahead** of GMT, so the Japanese astronomer would take 8 hours off his time.

East coast US time is **5 hours behind** GMT, so the American astronomer would add 5 hours to his time.

Both times would then be in GMT and they could see who saw the comet first. (Of course, being astronomers, they would call it Universal Time, but it is the same thing!)

**See answer page for a technical note about this.

British Summer Time

British Summer Time is a system in which all the clocks in the country are put forward one hour in the spring and back one hour in the autumn. In other words, clocks show GMT in the winter and British Summer Time (BST) in the summer.

It also means that the sun is due south at 1 o'clock in the summer, not at 12 noon.

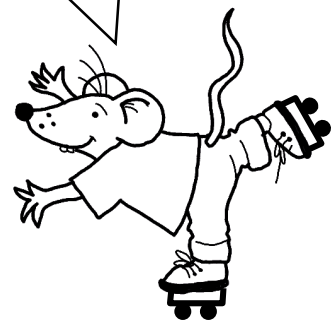
When we put the clocks forward an hour in the spring, we get up an hour earlier, go to work or school an hour earlier and come home an hour earlier. In fact, we do everything an hour earlier.

The advantage of this is that it is an hour longer between coming home and the sun setting. This means we have an extra hour of daylight in the evenings to enjoy ourselves.

Sounds like a good idea to me. Who thought of it?



I don't know, but I'm off skating.



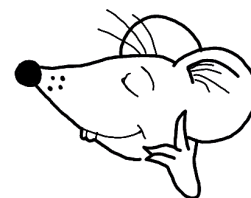
Those of you that are interested in history might like to know that during the Second World War clocks were put forward **two** hours to give more time for families to be together before the air raids began.

If you want more information on time differences, you can visit several websites. One we recommend is: **www.worldtimezone.com**

Here is a table of time differences relative to Greenwich Mean Time. Study it carefully and then answer the questions.

Place	Time difference
Tokyo	+ 8 hours
Perth	+ 8 hours
Sydney	+10 hours
Oslo	+ 1 hours
Lisbon	+ 0 hours
Moscow	+ 3 hours
Cook Islands	-10 hours
Tomsk	+ 7 hours
Los Angeles	- 8 hours
Kansas City	- 6 hours
Denver	- 7 hours

+7 means add seven hours on, so 2 p.m. becomes 9 p.m., for example.



1. If it is **noon** at Greenwich, what time is it in the following places?

a. Moscow b. Lisbon c. Kansas City d. Oslo

2. If it is **3 p.m.** at Greenwich, what time is it in the following places?

a. Tokyo b. Perth c. Tomsk d. Denver

3. If it is **23.00** at Greenwich, what time is it in the following places?

a. Los Angeles b. Sydney c. The Cook Islands d. Lisbon

4. What is the time difference between each pair of places?

a. Perth and Sydney b. Tomsk and Tokyo
c. Kansas City and Moscow d. Perth and Los Angeles

Answers

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******Because the Earth does not move around the Sun in a perfect circle, the Sun is only due south at 12 noon on four days per year (April 16th, June 15th, September 2nd and December 26th). On other days, the time difference can be up to 16.33 minutes, which occurs on November 4th. This difference is known as the 'Equation of Time'.

Source: Norton's Star Atlas.

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1. **a.** 3 p.m. **b.** noon **c.** 6 a.m. **d.** 1 p.m.
2. **a.** 11 p.m. **b.** 11 p.m. **c.** 10 p.m. **d.** 8 a.m.
3. **a.** 15.00 **b.** 09.00 the next day **c.** 13.00 **d.** 23.00
4. **a.** 2 hours **b.** 1 hour **c.** 9 hours **d.** 16 hours