All about time

Time is one of the world's deepest mysteries. No one can say exactly what it is. Yet, the ability to measure time makes our way of life possible. Most human activities involve groups of people acting together in the same place at the same time. People could not do this if they did not all measure time in the same way.

The passing of time depends on **changes** taking place. The first people to keep time probably counted on natural repeating events (like the rise and fall of the sun) and used them to keep track of events that did not repeat. Later, people made clocks to show the regularity of natural events. When people began to count repeating events, they began to measure time.

Units of time

For early peoples, the only changes that were truly regular (repeated themselves evenly) were the motions of objects in the sky. The most obvious of these changes was the alternate daylight and darkness, caused by the rising and setting of the sun. Each of these cycles of the *sun* came to be called a **day**.

Another regular change in the sky was the change in the visible shape of the moon. Each cycle of the *moon's* changing shape takes about 29½ days, or a **month**.

The cycle of the seasons gave people an even longer unit of time. By watching the stars just before dawn or after sunset,

people saw that the sun moved slowly eastward among the stars. The sun made a full circle around the sky in one cycle of the *seasons*—this cycle takes about 365 days, or a **year**.

There is no regular change in the sky that lasts seven days (a week). The seven-day week came from the **Jewish** custom of a **Sabbath** (a day of rest) every seventh day.

The division of a day into 24 hours, an hour into 60 minutes, and a minute into 60 seconds probably came from the ancient **Babylonians**. The Babylonians divided the imaginary circular path of the sun into 12 equal parts. Then they divided the periods of daylight and darkness into 12 parts each, resulting in a 24-hour day.

The Babylonians also divided the circle into 360 parts called degrees. Other ancient astronomers further divided each degree into 60 minutes. Later, clocks became accurate enough to need smaller units than the hour—dividing one minute into 60 seconds.

Devices that measure time

The **sundial** was one of the earliest devices for measuring time. But it can work only in unclouded daylight. A sundial measures time by the position of the sun. The most commonly seen sundial designs cast a shadow on a flat surface marked with the hours of the day. As the position of the sun changes, the time indicated by the shadow changes.

Early peoples also used **ropes with knots** tied at regular intervals or **candles** marked with regularly spaced lines/grooves. When burned, such devices measured time.

An **hourglass** tells time by sand trickling through a narrow opening. A **water clock** measures time by allowing water to drip slowly from one marked container into another.

By the 1700s, people had developed clocks and watches that told time to the minute. Modern electronic and atomic clocks can measure time with far greater accuracy.

Time zones

Clocks in different parts of the world do not all show the same time. Suppose they all did show the same time: 3 pm, for example. At that time, people in some countries would see the sun rise, and people in other lands would see it high in the sky. Still, in other countries, the sun could not be seen because 3 p.m. would occur at night. Instead, clocks in all locations show 12 o'clock at midday.

Every place on the earth that is east or west of another place has noon at a different time. The time at any particular place is called the **local time**. At noon local time in one town, the time might be 11 a.m. in another place west of the town or 1 p.m. in a place to the east.

If every community used a different time, travelers would be confused and many other problems would be created. To avoid all such problems, **standard time zones** were established.

In 1883, **24 zones** were set up around the world. The idea of time zones was introduced by a Scottish-born Canadian engineer, **Sandford Fleming**.

questions

1. The passing of time depends on _____ taking place. (1 mark)

2. The first people to keep time probably counted on _____. (1 mark)

3. Days are based on cycles of the _____. (1 mark)

4. Months are based on cycles of the _____. (1 mark)

5. Years are based on cycles of the _____. (1 mark)

6. Where did the seven day week come from? (2 marks)

7. Who were the first ancient civilization to divide the day, minutes, and seconds? (1 mark)

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8. Fill in the following: (5 marks)

    a. _____ hours make a day.

    b. Divide a day into 2 equal parts = _____ hours.

    c. A circle is divided into _____ degrees.

    d. Each degree is divided into _____ minutes.

    e. Each minute is divided into _____ seconds.

8. Identify and explain 5 early devices that were used to measure time. (10 marks)

9. The time at any particular place is called the

_____. (1 mark)

10. How many time zones does the world have? (1 mark)

11. Who came up with the idea of time zones? (1 mark)

12. Why were time zones invented? (3 marks)

Total: / 29