

**EXERCISE 1**

Match the number to its corresponding unit of measurement and fact from the article.

Number		Unit of Measurement		Fact
1. 2 billion	<input type="radio"/>	<input type="radio"/> seconds	<input type="radio"/>	<input type="radio"/> Atomic clocks can measure time to within one second in this period of time
2. 15	<input type="radio"/>	<input type="radio"/> times	<input type="radio"/>	<input type="radio"/> Optical clocks can keep time for this long
3. over 80 million	<input type="radio"/>	<input type="radio"/> years	<input type="radio"/>	<input type="radio"/> A normal wristwatch loses this length of time each month
4. less than one	<input type="radio"/>	<input type="radio"/> years	<input type="radio"/>	<input type="radio"/> Optical clocks are more accurate than atomic clocks by this number
5. at least 21	<input type="radio"/>	<input type="radio"/> metre	<input type="radio"/>	<input type="radio"/> The minimum distance of an object on the surface of the Earth that optical clocks on satellites can detect

**EXERCISE 2**

Fill in the blanks with the common or proper nouns.



GPS    Louis Essen  
 electrons    clock    ships  
 lasers    caps    scientists  
 second    years    cars  
 standard    ranges    NIST

- Optical clocks use \_\_\_\_\_ to detect and measure the frequency with which \_\_\_\_\_ in atoms vibrate.

2. Scientists at the National Institute of Standards and Technology or \_\_\_\_\_ in Colorado, USA, have created the most advanced \_\_\_\_\_ in the world.
3. \_\_\_\_\_ believe that within the next 10 years, it will be possible to create a clock that is so accurate that it will work with total accuracy for 13.7 billion \_\_\_\_\_.
4. Atomic clocks measure time to within one \_\_\_\_\_ in over 80 million years.
5. British physicist, \_\_\_\_\_, created atomic clocks in 1955.
6. Optical clocks will replace the existing atomic ones by 2010 in order to set an even more accurate \_\_\_\_\_ for universal time than they do now.
7. The optical clocks are already having an impact in the field of global positioning systems or \_\_\_\_\_.
8. GPS satellites track planes, \_\_\_\_\_ and \_\_\_\_\_.
9. Scientists also believe that satellites armed with optical clocks will one day map the world's ice \_\_\_\_\_ and mountain \_\_\_\_\_ with total accuracy.

## GROUP ACTIVITY

- Time is precious. In business, time equates with money. In sports, time and speed equates with winning. In personal life, time means accomplishment if it is well spent. Read these quotes and discuss what they mean:

1. Time is the coin of your life. It is the only coin you have, and only you can determine how it will be spent. Be careful lest you let other people spend it for you.  
~ Carl Sanders
2. The great French Marshall Lyautey once asked his gardener to plant a tree. The gardener objected because the tree was slow growing and would not reach maturity until 100 years later. The Marshall replied, 'In that case, there is no time to lose; plant it this afternoon!' ~ John F. Kennedy



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3. Time is an equal opportunity employer. Each human being has exactly the same number of hours and minutes every day. Rich people can't buy more hours. Scientists can't invent new minutes. And you can't save time to spend it on another day. Even so, time is amazingly fair and forgiving. No matter how much time you've wasted in the past, you still have an entire tomorrow. ~ Denis Waitely
4. Better three hours too soon, than one minute too late. ~ William Shakespeare
5. "Time is free, but it's priceless. You can't own it, but you can use it. You can't keep it, but you can spend it. Once you've lost it you can never get it back." ~ Harvey MacKay
6. For every minute spent in organising, an hour is earned.
7. You can't change the past, but you can ruin the present by worrying about the future.
8. Don't count every hour in the day, make every hour in the day count.
9. We all have our time machines. Some take us back; they're called memories. Some take us forward; they're called dreams. ~ Jeremy Irons