

This set of answers to QUIZ # 2 are answered with the best of my knowledge, at the time of writing ..
I cannot guarantee that the answers are totally correct, also, nothing remains static. Wikipedia is always available for further references to these problems.

Answer to question 1 /

I can't really add much to these links.

Helpful link/s - <http://www.madsci.org/posts/archives/1998-03/890662272.Sh.r.html>
- http://www.sciam.com/article.cfm?id=experts-time-division-days-hours-minutes&topic_id=11

Answer to question 2 /

As sundials were the main way to count out the hours in daylight, and the main development of 'hours' occurred in the northern hemisphere where shadows go what we now call 'clockwise' around a central pivot or 'style', it was only natural that all clocks derived from this idea would also have their 'hands' rotating in the same direction.

Helpful link/s - <http://www.csiro.au/resources/SundialActivity.html>

Answer to question 3 /

Liquid paper base white is basically titanium dioxide in a methylcyclohexane 'solvent' with other chemicals added to help flow, drying strength, and odour.

Helpful link/s - http://inventors.about.com/od/lstartinventions/a/liquid_paper.htm
- http://www.allendale.k12.mi.us/district/operations/msds/l/Liquid_Paper.pdf

Answer to question 4 /

As you will see when searching the internet ..

Nobody really has a definitive answer to this question.

Maybe it was originally part of the 'fight or flight' reaction, as the body was loading itself with hormones and other chemicals to help cope with a potentially dangerous situation?

Helpful link/s -

http://books.google.com.au/books?id=P6aqqfDwbtoC&pg=PA165&lpg=PA165&dq=blushing+as+a+signal&source=web&ots=37yT8Uxg99&sig=iXlM9gx7o_75_EGcrJljqFuceg&hl=en&sa=X&oi=book_result&resnum=8&ct=result
- <http://serendip.brynmawr.edu/exchange/node/1696>

Answer to question 5 /

Most domestic and commercial 'weed' killers use a chemical known as glyphosate.

This chemical seems to work by stopping the new growth tips (both on top of the plant and underground) from operating.

Helpful link/s - <http://npic.orst.edu/factsheets/glyphogen.pdf>
- <http://www.pan-uk.org/pestnews/Actives/glyphosa.htm>

Answer to question 6 /

The lower atmosphere of the Earth is fairly well protected from most of the dangerous and powerful solar radiations, hence, the lower atmosphere is much cooler than the higher more exposed layers, but ..

As the ground and sea areas of the Earth get warmed up by absorbing some of the radiation that manages to get through, it warms up the air directly above it, mainly by conduction.

This air layer close to the Earth's surface is then warmer than the air directly above it.

This difference is obvious if you travel up a mountain.

Helpful link/s - <http://www.newton.dep.anl.gov/askasci/wea00/wea00082.htm>

Answer to question 7 /

Sulphur used to be the main additive to rubber during its curing phase.

This process of curing is called vulcanising (hence the term - vulcanised rubber).

Sulphur seems to have been replaced in many instances with polystyrene like polymers.

Helpful link/s

- <http://www.wisegeek.com/what-is-vulcanized-rubber.htm>

- http://www.essortment.com/all/historyofrubbe_rcml.htm

- <http://www.freshpatents.com/Rubber-composition-and-tire-dt20081204ptan20080295935.php>

Answer to question 8 /

- Evaporative coolers work very efficiently in very dry air conditions.

They work by 'evaporative cooling' the air that is going to be used. *See links as to how this works.*

They have 3 drawbacks in this situation though.

The first is obvious, they require a good supply of clean water. Not always easily found for cooling when it is needed for surviving in the lower latitudes.

Secondly, they have to keep bringing in fresh outside dryer air to aid in the evaporation and hence cooling process.

This creates a major drawback in that the fresh air brought into the area to be cooled is usually from the much hotter outside which means a lot of cooling is required to bring it down to liveable temperatures.

Thirdly, the evaporation process usually has to be of a high level to cool the hot air enough, and because of this, the air becomes much more humid.

This can make the hot situation worse by making it very uncomfortable for the occupants (even though it might be slightly cooler) and creating a more corrosive atmosphere for metals.

- Heat pump style refrigeration keeps the cooling liquid inside a closed loop that never enters the atmosphere (supposedly). *See links as to how this works.*

As the air to be used for occupation does not have to be continually replaced by outside air, and as the humidity is not continually rising (in fact it can be reducing), it will become a more economic way to cool.

(Evaporative cooling may still have the edge in very dry climates.)

In some very well insulated situations the refrigeration cooler may even be turned off for considerable time periods, further helping it to be more efficient.

Also, the closed cycle cooling loop is *pumping heat* out of the living environment, a much more efficient way to operate. The amount of energy required to shift the heat is usually less than *half* the amount of the heat energy that is being transferred. (continued)

- Helpful link/s - http://www.health.vic.gov.au/environment/downloads/evaporative_coolers.pdf
- http://www.consumerenergycenter.org/home/heating_cooling/evaporative.html
(warning : imperial measurements only)
- <http://www.piec.com/aboutec.htm>
(warning : this is an advertised site)
- <http://www.air-conditioning-and-refrigeration-guide.com/refrigeration-cycle.html>
(warning : imperial measurements only)
- http://www.warmair.net/html/refrigeration_cycle.htm

Answer to question 9 /

As old growth forest trees are usually larger than trees grown in commercial forests and the lower canopies are usually well stocked with smaller plants and animals, they usually have much more carbon locked up in their biomass. (very important in the fight against global warming)
They also have a very well balanced ecosystem that is very hard to re-establish once it has been damaged or destroyed.

Much of the timber sought from old growth forests is difficult to gain access to and, as a consequence, much undergrowth (which includes new saplings) has to be removed before clearing of the trees can commence, especially if the cutting down of trees is done on a large industrial scale.

Commercially grown forests are laid out to grow so fire trucks and cutting and removal equipment can gain easier access to the trees without damaging the surrounding growth.

If you enter a commercial forest area the first thing you notice is the lack of lower canopy growth and lack of wildlife.

They are almost sterile.

This is not what you want to occur to the fragile ecosystems of the natural wildernesses.

Helpful link/s - <http://www.green.net.au/adan/oldgr.htm>

- <http://www.schools.wafa.org.au/>
- <http://www.greenpeace.org.uk/media/press-releases/greenpeace-launches-rescue-station-to-protect-rainforest-paradise>
- <http://www.plantations2020.com.au/assets/acrobat/Forests,Wood&CarbonBalance.pdf>

Answer to question 10 /

At first thought this would seem an easy question to answer ..

Of course it would be better for the environment if all our vehicles were electrically powered and solar radiation was used to charge the batteries, but ..

Converting existing heavy vehicles over to batteries would be very expensive and would use more battery materials than would be needed for lighter vehicles that had been specifically made for electric drive systems.

The problems that occur are 2 fold ..

As most people who own cars would want an equivalent size vehicle to carry their families and goods around (usually meaning medium size vehicles) they would rather spend a small amount to have their existing car converted than having to pay out a larger amount to get a newer more eco-friendly vehicle.

And would the amount of carbon that would be saved from using solar electricity instead of petroleum, be equivalent to, less than, or greater than the amount of carbon that would be given out by industries as materials for the conversions are manufactured ? (continued)

I don't know the answer to this dilemma, but I do know that petroleum fuels is not the way to continue..

Even an intermediate stage of growing biofuels has to be better than doing nothing..

I also would like to convert *my* vehicle to electric drive ..

Helpful link/s – I leave that to you.

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