Our special planet -
Created to be inhabited

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Amazing design features of planet earth

In 1969, when observing the Earth from the moon, Apollo astronaut James Irwin said, "When you lean far back and look up, you can see the earth like a beautiful, fragile Christmas tree ornament hanging in the blackness of space". The delicate blue shell of the atmosphere, the deep blue of the sea, the brown continents, the white polar caps and smudges of cloud, all in stark contrast with the pitch blackness of space with its myriads of stars, make the earth the most beautiful place in the universe. There is a hidden beauty about our planet that makes it apparent that earth is extraordinarily well suited to be the home for mankind, just as it has been designed to be. Let's explore just a few of the amazing features of our planet that make it so well suited for life.

Earth's orbit

Planet Earth moves in a nearly perfectly circular orbit around the sun. In this zone, liquid water can exist so it is not too hot, to prevent all the water from boiling away, and not too cold, to prevent all the water from freezing solid.

For liquid water to exist on a planet, that planet must have a solid surface and an atmosphere providing sufficient pressure at the surface to prevent all the water evaporating. In fact, on earth, water can and does exist in all three states (liquid, solid (ice) and water vapour) and can move fairly easily from one state to another. If the earth's orbit were highly elliptical (oval-shaped), there would be large variations in temperature, making the environment unsuitable for life.

Earth's spin

The earth spins on its axis once per solar day, providing variation of night and day and providing colourful displays in the clouds at sunrise and sunset. The rotation of the earth helps to regulate the temperature around the globe so no one part becomes too hot or too cold. If the earth didn't rotate, one side would be permanently facing the sun, and would be searingly hot, with the other in permanent frozen darkness.

Earth's axis

The axis of the earth is tilted about 23.5 degrees, so we experience a variation of seasons each year. In the northern hemisphere summer, the North Pole is tilted towards the sun so the sun is higher in the sky and the days are longer than the nights. At the same time the southern hemisphere is experiencing its winter. The reverse is true six months later. When the sun passes through Earth's equatorial plane, the days and

nights are of equal length. This is called equinox and occurs in late March and late September.

The variation of seasons is vital for many forms of life to thrive. The annual cycle of cold to warm seasons regenerates plants and animals and serves to measure the passing of time with variety in the weather conditions around us. The warmth of summer gives way to the glorious colours of autumn, then to the repose of winter followed by the explosion of new life in the spring.

Our Moon

Orbiting around the earth every 29.5 days, the moon serves a vital role in making the earth suitable for habitation. At around one-eightieth of the mass of the earth, our moon is far larger compared with its planet than any other of the more than 60 moons in the solar system. One of the most evident influences of the moon, apart from being a source of light at night (reflected sunlight), is to be the principal cause of tides in the oceans of the world.

Each day sees two high tides and two low tides, which repeat on an approximately 25-hour cycle. These tides are essential for circulating and oxygenating the coastal waters in bays and river estuaries around the world to promote marine ecosystems and avoid stagnation. If the moon was much smaller, like other moons in the solar system, the tides would be ineffective in supporting coastal life. If it were much larger, the coasts would be subject to massive destructive tides twice a day.

Solar Eclipses

Perhaps the most breathtaking natural phenomenon on earth is a total solar eclipse. Although the sun is 400 times larger than the moon, it is 400 times further away, and so both look to be almost exactly the same size in the sky. This means that on rare occasions, when the alignments are precisely correct, the moon will block out the light from the intensely bright photosphere of the sun for just two minutes or so, which enables us to observe the sun's thin faint chromosphere and the spectacular corona with its huge prominences. The region of totality is no more than about 200 km (120 miles) across, and it races across the surface of the earth from west to east.

Astronomers have learnt much about the nature of the sun, and therefore the stars, because of total solar eclipses. If the moon were much bigger, the chromosphere would only be fleetingly visible at the onset and end of an eclipse. If it were just a little smaller, totality would not occur and eclipses would hardly even be noticed. But the probability that such an amazing match of apparent size would just happen by chance is miniscule.

Earth's atmosphere

Consisting of 78% nitrogen and 21% oxygen, earth's atmosphere forms a thin sheath around the globe, held there by gravity, protecting and nourishing life on the planet. The atmosphere is contained within about 100 km (60 miles) of the earth's surface,

which is only about 1.5% of its radius, about the same proportions as the skin of an apple. Scattering the sun's light, the oxygen and nitrogen molecules produce a blue canopy which permits us to normally see only the sun and moon by day, but at night the atmosphere becomes transparent to reveal the planets and the stars. Oxygen is vital for life for all air-breathing creatures, but too much oxygen would make the air dangerously combustible and too little would not provide sufficient for life to thrive. Additionally, there is a variable amount of water vapour, around 1% at sea level, and less than 0.04% carbon dioxide, along with traces of other gases. Carbon dioxide is essential for plant life which, through the amazing process of photosynthesis, takes in carbon dioxide and gives out oxygen.

The atmosphere helps regulate the temperature of the earth and transports water vapour to facilitate the hydrological cycle of evaporation and precipitation (rainfall and snow, etc.) to distribute water around the earth. The interaction between the energy radiated from the sun and the atmosphere influences the weather patterns around the world, which in turn influence living things.

Water

The most abundant substance on the planet is water, the chemical formula for which is H_2O. The unique geometry of the H_2O molecule gives water a number of properties vital for life. Water, unlike most liquids, expands on freezing, so ice floats on water. This prevents lakes and rivers from freezing from the bottom up, so preserving many forms of aquatic life during winter. The amount of energy required to freeze, melt, boil or condense one gram of H_2O is higher than for almost all other substances, which means that water is very effective at moderating the earth's climate and acting as a coolant for larger animals. Also, the high surface tension of liquid water makes it effective in capillary action in soils, plants and biological systems. Around 72% of the earth's surface is covered in water.

If the mountains were lowered and the ocean basins raised so the earth was a perfect sphere, the oceans would cover the Earth to a depth of around 3 km (2 miles)

How amazing is that?

The more we learn about our planet the more amazed we are at how extraordinarily well suited it is for life. The evidence is not consistent with natural processes occurring randomly over vast periods of time. Those who believe there is a Creator God, as revealed in the book of Genesis, are not surprised to find evidence of amazingly intricate design reflecting the power, intelligence and care of the God who made us. So when we see such things, we realise there is a Designer who made planet Earth to be our home.

Isaiah 45:18 says, "For this is what the LORD says—he who created the heavens, he is God; he who fashioned and made the earth, he founded it; he did not create it to be empty, but formed it to be inhabited … ."

References and notes
1. Irwin, J. and Emerson, W.A., To Rule the Night, A.J. Holman Company, Nashville, 1973 (fi rst edition), p. 11.
2. Sarfati, J. The wonders of water, Creation 20(1):44–47, 1997; creation.com/water.
3. Catchpoole, D., In pursuit of plant power, 25 September 2012; creation.com/plantpower.
4. Cousteau, J., The Ocean World of Jacques Cousteau—Oasis In Space, Angus & Robertson (U.K.) Ltd. London, England, p.17, 1973.

Activities

Make a poster as follows:

1. Draw, copy or cut out a picture of the earth as seen from space, and place it in the centre of a large sheet of paper, (at least A3 size)
2. Now around the drawing make headings used in the article. Under the headings use dot points to summarize a few main ideas for each heading.