

# The Sun-Earth's Closest Star

By Laura G. Smith



<sup>1</sup> Have you ever noticed that cartoon images of the sun usually include a happy face? There's something about the sun that just makes us feel good. Maybe it's the warmth it provides or the way it brightens the sky as it peeks through the clouds after a storm. But beyond that warm, fuzzy feeling, the sun provides much more. In fact, life on our planet would not exist without the sun's energy.



<sup>2</sup> The sun is a huge ball of hot, glowing gases that lies at the center of our solar system. It contains about 70 of the 92 natural elements that occur on the earth. The sun is made up of about 75% hydrogen, 24% helium, and just 1% of other elements.

<sup>3</sup> The sun is one of billions of stars in the universe, and it is the earth's closest star. With a diameter of about 865,000 miles, the sun is only medium in size when compared to other stars. While some stars have a diameter 10 times smaller than the sun, others have diameters up to 10,000 times larger.

<sup>4</sup> When you look at the sun and moon as they appear in the sky, they seem to be about the same size as each other, but the diameter of the sun is actually 400 times greater than that of the moon. They only appear similar because the sun is 400 times further away from the earth than the moon!

<sup>5</sup> Just like the earth, the sun spins (or rotates) on its axis and takes about one month to complete a single rotation. The strong gravitational pull of the sun holds the earth and the other eight planets in orbit around it. As the planets revolve around the sun, the sun revolves around the center of the **Milky Way galaxy**. The earth takes about one year to revolve around the sun, but it takes the sun about 250 million years to revolve one time around its galaxy! The Milky Way is made up of dust, gases, planets, and about 100 billion stars. The sun, planets, and stars that make up our solar system are only a small speck in this huge galaxy!

<sup>6</sup> Because scientists can't get close enough to the sun to directly measure its temperatures, they have studied the sun's rays to figure out that the sun's surface is about 10,000° F., and its center reaches 27,000,000° F.! Only very small amounts of the sun's light and heat reach the earth, and the rest of it is released in outer space. It takes about eight minutes for light to travel 93 million miles from the sun to the earth.

<sup>7</sup> The earth's atmosphere helps to trap the sun's light and heat to keep it from

escaping back into space. Plants, animals, and humans all depend on this light and heat to help them live.

<sup>8</sup> Green plants soak up sunlight and use it, along with water and carbon dioxide, to produce their own food so they will grow. This process of **photosynthesis** also produces oxygen, which is needed by animals and humans. Animals and humans eat the plants and give off carbon dioxide needed for photosynthesis.

<sup>9</sup> The sun also affects the temperatures and weather on the earth. Tropical regions near the equator have hot climates because the sun is directly overhead at noon, but the North and South poles have cold climates because the sun never rises far above the horizon. As rivers, lakes, and oceans absorb heat from the sun, some of the water evaporates and eventually falls back to the earth's surface in the form of rain or snow.

<sup>10</sup> The sun provides much of the energy on the earth that people use for power and fuel. The sun's heat brings about changes in the air that create wind that can be used to power windmills. Other devices called **solar cells** turn sunlight into electricity. These cells have been used to provide power for artificial satellites and spacecraft. Sunlight can heat a gas or liquid, which can then be circulated through a building to heat the building. Even the energy stored in fossil fuels, such as petroleum, coal, and natural gas, came indirectly from the sun.

<sup>11</sup> Scientists have made great progress in the study of the sun's surface, energy production, structure, and relationship to the earth and solar system, since the day man first observed the sun from space. Study from space was launched in 1957 when Russia's second artificial satellite, Sputnik 2, carried instruments that could collect valuable information about our solar system. Since then, many missions have been devoted to studying this remarkable star we call the sun.

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| <p>1. The sun is one of the largest stars in the galaxy.</p> <p><input type="radio"/> A True</p> <p><input type="radio"/> B False</p> | <p>2. The sun is</p> <p><input type="radio"/> A 400 times as wide as the moon</p> <p><input type="radio"/> B 400 times as wide as the earth</p> <p><input type="radio"/> C The same size as the earth</p> <p><input type="radio"/> D The same size as the moon</p> |
|---|--|

<p>3. The sun completes a single rotation in about</p> <p><input type="radio"/> A The sun does not rotate</p> <p><input type="radio"/> B One week</p> <p><input type="radio"/> C One year</p> <p><input type="radio"/> D One month</p>	<p>4. Scientists have determined that the surface of the sun reaches temperatures of about</p> <p><input type="radio"/> A 10,000° F.</p> <p><input type="radio"/> B 1,000,000° F.</p> <p><input type="radio"/> C 1,000° F.</p> <p><input type="radio"/> D 100,000° F.</p>
<p>5. The sun revolves around the center of the</p> <p><input type="radio"/> A Milky Way</p> <p><input type="radio"/> B Universe</p> <p><input type="radio"/> C Mars Bar</p> <p><input type="radio"/> D Solar System</p>	<p>6. A very small amount of the sun's heat and light actually reaches the surface of the earth.</p> <p><input type="radio"/> A True</p> <p><input type="radio"/> B False</p>
<p>7. ____ have been used to provide power for artificial satellites and spacecraft.</p> <p><input type="radio"/> A Windmills</p> <p><input type="radio"/> B Hydraulic power</p> <p><input type="radio"/> C Solar cells</p> <p><input type="radio"/> D Liquid gases</p>	<p>8. The sun is the easiest star for scientists to study because it is the</p> <p><input type="radio"/> A Star that smiles</p> <p><input type="radio"/> B Closest star to the earth</p> <p><input type="radio"/> C Brightest star</p> <p><input type="radio"/> D Biggest star</p>