

Earth

Earth is the third planet from the Sun and the only astronomical object known to harbor life. About 29% of Earth's surface is land consisting of continents and islands. The remaining 71% is covered with water, mostly by oceans but also by lakes, rivers and other fresh water, which together constitute the hydrosphere. Much of Earth's polar regions are covered in ice. Earth's outer layer is divided into several rigid tectonic plates that migrate across the surface over many millions of years. Earth's interior remains active with a solid iron inner core, a liquid outer core that generates Earth's magnetic field, and a convecting mantle that drives plate tectonics.

According to radiometric dating estimation and other evidence, Earth formed over 4.5 billion years ago. Within the first billion years of Earth's history, life appeared in the oceans and began to affect Earth's atmosphere and surface, leading to the proliferation of anaerobic and, later, aerobic organisms. Some geological evidence indicates that life may have arisen as early as 4.1 billion years ago. Since then, the combination of Earth's distance from the Sun, physical properties and geological history have allowed life to evolve and thrive. In the history of life on Earth, biodiversity has gone through long periods of expansion, occasionally punctuated by mass extinctions. Over 99% of all species that ever lived on Earth are extinct. Almost 8 billion humans live on Earth and depend on its biosphere and natural resources for their survival. Humans increasingly impact Earth's hydrology, atmospheric processes and other life.

Earth's atmosphere consists mostly of nitrogen and oxygen. Tropical regions receive more energy from the Sun than polar regions, which is redistributed by atmospheric and ocean circulation. Greenhouse gases also play an important role in regulating the surface

Earth ⊕



The Blue Marble, the most widely used photograph of Earth,^{[1][2]} taken by the Apollo 17 mission in 1972.

Designations	
Alternative names	<u>Gaia</u> , <u>Gaea</u> , <u>Terra</u> , <u>Tellus</u> , the <u>world</u> , the <u>globe</u>
Adjectives	Earthly, terrestrial, terran, tellurian
Orbital characteristics	
Epoch J2000 ^[n 1]	
Aphelion	152 100 000 km (94 500 000 mi) ^[n 2]
Perihelion	147 095 000 km (91 401 000 mi) ^[n 2]
Semi-major axis	149 598 023 km (92 955 902 mi) ^[3]
Eccentricity	0.016 7086 ^[3]
Orbital period	365.256 363 004 d ^[4] <div>(31 558.149 7635 ks)</div>
Average orbital speed	29.78 km/s ^[5] <div>(107 200 km/h; 66 600 mph)</div>
Mean anomaly	358.617°
Inclination	7.155° to the <u>Sun's equator</u> ; <div>1.578 69°^[6] to <u>invariable plane</u>;</div> 0.000 05° to J2000 <u>ecliptic</u>
Longitude of ascending node	−11.260 64° ^[5] to J2000 <u>ecliptic</u>
Time of perihelion	2021-Jan-02 13:59 ^[7]

temperature. A region's climate is not only determined by latitude, but also by its proximity to moderating oceans and height among other factors. Extreme weather, such as tropical cyclones and heat waves, occurs in most areas and has a large impact on life.

Earth's gravity interacts with other objects in space, especially the Sun and the Moon, which is Earth's only natural satellite. Earth orbits around the Sun in about 365.25 days. Earth's axis of rotation is tilted with respect to its orbital plane, producing seasons on Earth. The gravitational interaction between Earth and the Moon causes tides, stabilizes Earth's orientation on its axis, and gradually slows its rotation. Earth is the densest planet in the Solar System and the largest and most massive of the four rocky planets.

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<u>Argument of perihelion</u>	114.207 83° ^[5]		
<u>Satellites</u>	1 natural satellite: the <u>Moon</u> 5 <u>quasi-satellites</u> >1 800 operational <u>artificial satellites</u> ^[8] >16 000 <u>space debris</u> ^[n 3]		
Physical characteristics			
<u>Mean radius</u>	6 371.0 km (3 958.8 mi) ^[9]		
<u>Equatorial radius</u>	6 378.1 km (3 963.2 mi) ^{[10][11]}		
<u>Polar radius</u>	6 356.8 km (3 949.9 mi) ^[12]		
<u>Flattening</u>	0.003 3528 ^[13] 1/298.257 222 101 (ETRS89)		
<u>Circumference</u>	40 075.017 km <u>equatorial</u> (24 901.461 mi) ^[11] 40 007.86 km <u>meridional</u> (24 859.73 mi) ^{[14][n 4]}		
<u>Surface area</u>	510 072 000 km ² (196 940 000 sq mi) ^{[15][n 5]} 148 940 000 km ² land (57 510 000 sq mi) 361 132 000 km ² water (139 434 000 sq mi)		
<u>Volume</u>	1.083 21 × 10 ¹² km ³ (2.598 76 × 10 ¹¹ cu mi) ^[5]		
<u>Mass</u>	5.972 37 × 10 ²⁴ kg (1.316 68 × 10 ²⁵ lb) ^[16] (3.0 × 10 ^{−6} <i>M</i> _⊙)		
<u>Mean density</u>	5.514 g/cm ³ (0.1992 lb/cu in) ^[5]		
<u>Surface gravity</u>	9.806 65 m/s ² (1 <i>g</i> ; 32.1740 ft/s ²) ^[17]		
<u>Moment of inertia factor</u>	0.3307 ^[18]		
<u>Escape velocity</u>	11.186 km/s ^[5] (40 270 km/h; 25 020 mph)		
<u>Sidereal rotation period</u>	0.997 269 68 d ^[19] (23h 56m 4.100s)		
<u>Equatorial rotation velocity</u>	0.4651 km/s ^[20] (1 674.4 km/h; 1 040.4 mph)		
<u>Axial tilt</u>	23.439 2811° ^[4]		
<u>Albedo</u>	0.367 <u>geometric</u> ^[5] 0.306 <u>Bond</u> ^[5]		
<u>Surface temp.</u>	min	mean	max
<u>Kelvin</u>	184 K ^[21]	287.16 K ^[22] (1961–90)	330 K ^[23]
<u>Celsius</u>	−89.2 °C	14.0 °C (1961–90)	56.7 °C
<u>Fahrenheit</u>	−128.5 °F	57.2 °F (1961–90)	134.0 °F
Atmosphere			
	101.325 kPa (at <u>MSL</u>)		

<div>Atmosphere</div> <div> <div>Weather and climate</div> <div>Upper atmosphere</div> </div> <div>Life on Earth</div> <div>Human geography</div> <div>Natural resources and land use</div> <div>Cultural and historical viewpoint</div> <div>See also</div> <div>Notes</div> <div>References</div> <div>External links</div>	<div>Surface pressure</div> <div> <div>Composition by volume</div> <div> <div>78.08% nitrogen (N₂; dry air)^[5]</div> <div>20.95% oxygen (O₂)</div> <div>~ 1% water vapor (climate variable)</div> <div>0.9340% argon</div> <div>0.0413% carbon dioxide^[24]</div> <div>0.00182% neon^[5]</div> <div>0.00052% helium</div> <div>0.00019% methane</div> <div>0.00011% krypton</div> <div>0.00006% hydrogen</div> </div> </div>
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Etymology

The modern English word *Earth* developed, via Middle English, from an Old English noun most often spelled *eorðe*.^[25] It has cognates in every Germanic language, and their ancestral root has been reconstructed as **erþō*. In its earliest attestation, the word *eorðe* was already being used to translate the many senses of Latin *terra* and Greek γῆ *gē*: the ground, its soil, dry land, the human world, the surface of the world (including the sea), and the globe itself. As with Roman *Terra*/Tellūs and Greek *Gaia*, Earth may have been a personified goddess in Germanic paganism: late Norse mythology included *Jörð* ('Earth'), a giantess often given as the mother of *Thor*.^[26]

Historically, *earth* has been written in lowercase. From early Middle English, its definite sense as "the globe" was expressed as *the earth*. By Early Modern English, many nouns were capitalized, and *the earth* was also written *the Earth*, particularly when referenced along with other heavenly bodies. More recently, the name is sometimes simply given as *Earth*, by analogy with the names of the other planets, though *earth* and forms with *the* remain common.^[25] House styles now vary: Oxford spelling recognizes the lowercase form as the most common, with the capitalized form an acceptable variant. Another convention capitalizes "Earth" when appearing as a name (for example, "Earth's atmosphere") but writes it in lowercase when preceded by *the* (for example, "the atmosphere of the earth"). It almost always appears in lowercase in colloquial expressions such as "what on earth are you doing?"^[27]

Occasionally, the name **Terra** /ˈtɛərə/ is used in scientific writing and especially in science fiction to distinguish humanity's inhabited planet from others,^[28] while in poetry **Tellus** /ˈtɛləs/ has been used to denote personification of the Earth.^[29] The Greek poetic name *Gaea* (*Gæa*) /ˈdʒiːə/ is rare, though the alternative spelling **Gaia** has become common due to the Gaia hypothesis, in which case its pronunciation is /ˈɡaɪə/ rather than the more Classical /ˈɡeɪə/.^[30]

There are a number of adjectives for the planet Earth. From *Earth* itself comes *earthly*. From the Latin *Terra* comes *Terran* /ˈtɛərən/,^[31] Terrestrial /təˈrɛstriəl/,^[32] and (via French) *Terrene* /təˈriːn/,^[33] and from the Latin *Tellus* comes *Tellurian* /tɛˈlʊəriən/^[34] and *Telluric*.^[35]

Chronology

Formation