

Examrace

The Earth Data, the World, the Earth and the Solar System, Latitude and Longitude

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The Earth Data

Surface Area : 510, 100, 500 Sq. Kms.

Land Surface : 148,950,800 Sq.Kms. (29.08%)

Water Surface : 361,149,700 Sq.Kms. (70.92%)

Equatorial circumference : 40,075 Kms.

Polar circumference : 40,008 Kms

Equatorial radius : 6,377 Kms.

Equatorial Diameter : 1, 22,756 Kms.

Polar radius : 6,357 Kms.

Polar Diameter : 12,714 Kms.

Mean distance from the

Sun : 14, 95, 97,900 Kms.

Period of revolution : 365 days 5 hours 48 mts.

45.51 Sec.

Period of rotation : 23 hrs. 56 mts. 4.091 Sec.

Escape Velocity from

The earth : 11 Km per Sec. (minimum)

The World

The Earth and the Solar System

- The Earth is a member of the Solar System. It is one of nine major planets revolving round the Sun. Of these, Mercury and Venus are nearer, and Mars, Jupiter, Saturn, Uranus, Neptune and Pluto are farther away from the Sun than the Earth.
- The planets radiate no light of their own, but shine with that reflected from the Sun. The Sun has a diameter of 864,000 miles (1,390,000 Kms) and it is 93,000,000 miles (150,000,000 Kms) from the Earth. The Sun is a star. The stars, unlike the planets, are self-luminous

bodies. The other stars appear small because they are so far away; the nearest star, Proxima Centauri, is 200,000 times more distant from us than the Sun.

- The Moon is a dead planet. It is about 240,000 miles (386,000 Kms) from the Earth. The Moon revolves round the Earth taking approximately 29 days to complete one round. The phases of the Moon are the result of its position in relation to the Earth and the Sun.
- The Moon's orbit is ecliptically and inclined at an angle of 5° to the plane of the Earth's orbit. This explains why we do not have a total eclipse of the Sun every time there is a new moon.

The Earth

- The Earth is a sphere but it is not a perfect sphere. It is slightly flattened at the poles and bulges at the equator. The circumference of the earth is approximately 25,000 miles (40,000 Kms).
- It rotates on its axis once in every 24 hours, spinning from west to east. Besides spinning on its axis, it also moves round the Sun, called the revolution.
- Its orbit round the Sun is oval or ecliptically. The time taken to complete one revolution is approximately $365\frac{1}{4}$ days or one year. For convenience, one year is taken as 365 days and the shortfall of $\frac{1}{4}$ day each year is made good in the Leap Year which consists of 366 days. The Earth's axis inclined to the plane of its orbit at an angle of $66\frac{1}{2}^\circ$.
- The seasons are due to the change of the Earth's position in the course of its revolution about the Sun, and to the inclination of its axis. The Equator is an imaginary line drawn round the Earth midway between the Poles. There are two other lines, namely, Tropic of Cancer ($23\frac{1}{2}^\circ$ N) and the Tropic of Capricorn ($23\frac{1}{2}^\circ$ S). The word tropic means, 'turning place'. The inclination of the Earth's axis together with its revolution round the Sun is the cause of the varying length of day and night in different parts of the world. On March 21 (Vernal Equinox) and September 23 (Autumnal Equinox) the Sun is over-head at the Equator. On these dates, except at the Poles, (a) days and nights are equal all over the world; and (b) the Sun rises exactly due east and set exactly due west at all places on the Earth's surface. At the Equator itself days and nights are equal throughout the year. Between March 21 and September 23, when the North Pole is tilted towards the Sun, the days are longer than the nights throughout the Northern Hemisphere and there is continuous daylight at the North Pole. Similar conditions are experienced in the Southern Hemisphere and the South Pole between September 25 and March 21.

Latitude and Longitude

- Latitude is distance, measured in degrees, north or south of the Equator. Longitude is distance, measured in degrees, east or west of any fixed meridian. The meridian passing through Greenwich is numbered 00. On a globe the meridians are numbered from 0° to 180° E (East) or W (West). At the equator the degrees are 69 to 70 miles apart

$(25000 \div 360)$. Since earth completes one rotation on its axis in 24 hours, 360 meridians pass under the Sun in that time. Therefore, 1 degree passes under the Sun every 4 minutes.

International Date Line

- If we travelled westward to a place X on longitude 180° W, the time there would be 12 hours behind Greenwich Time (180×4 minutes = 720 minutes = 12 hours). If we journeyed eastward to a place Y on longitude 180° E, the time there would be 12 hours ahead of Greenwich Time. Thus X and Y both on 180° have the same time but differ in date by a day (12 hours + 12 hours = 24 hours).
- To overcome the confusion that would otherwise arise, the International Date Line has been established. It runs along 180° E or W. Westward-bound vessels crossing the Date Line drop a day from the calendar, while those going eastward add a day by giving the same date to two consecutive days.
- Instead of changing the time exactly according to change in degrees at the rate of 4 minutes per degree, certain time zones has been established. All places in the same area or time zone or time belt, use what is called Standard Time. Thus we have the Greenwich Mean Time (G.M.T) and the Indian Standard Time (I.S.T). There are five time-belts in Canada and four in United States.

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