

NECAP Science Grade 8 Reference Sheet

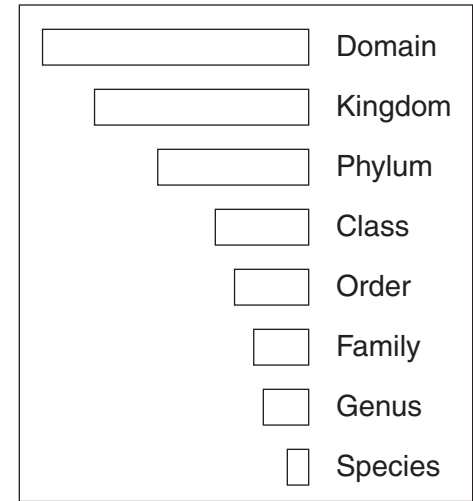
Solar System Data

| Object | Mean Distance to the Sun (AU*) | Diameter Relative to Earth | Density (g/cm ³) | Relative Gravity to Earth | Rotation (days) | Orbital Period (years) | Relative Mass to Earth | Number of Moons | Planet Type |
|--------------|--------------------------------|----------------------------|------------------------------|---------------------------|-----------------|------------------------|------------------------|-----------------|-------------|
| Planets | Earth | 1.0 | 1.0 | 5.5 | 1.0 | 1.0 | 1.00 | 1 | rocky |
| | Jupiter | 5.2 | 11.2 | 1.3 | 2.4 | 0.4 | 318 | 16 | gas |
| | Mars | 1.5 | 0.5 | 3.9 | 0.4 | 1.0 | 0.108 | 2 | rocky |
| | Mercury | 0.4 | 0.4 | 5.4 | 0.4 | 58.4 | 0.0553 | 0 | rocky |
| | Neptune | 30.1 | 3.9 | 1.6 | 1.1 | 0.7 | 164.8 | 8 | gas |
| | Saturn | 9.6 | 9.4 | 0.7 | 0.9 | 0.5 | 29.5 | 18 | gas |
| | Uranus | 19.2 | 4.0 | 1.3 | 0.9 | 0.7 | 84.0 | 21 | gas |
| | Venus | 0.7 | 0.9 | 5.2 | 0.9 | 243.0 | 0.6 | 0 | rocky |
| Sun | - | 109.0 | 1.4 | - | 24.6 | - | 333000 | - | - |
| Pluto** | 39.5 | 0.2 | 2.1 | 0.1 | 6.4 | 248.0 | 0.0021 | 1 | icy |
| Earth's Moon | 1.0 | 0.3 | 3.3 | 0.2 | 27.5 | - | 0.0123 | - | - |

* *Astronomical Unit (AU) – the average distance between Earth and the Sun (1.5×10^{11} m)*

** *Pluto is classified as a dwarf planet.*

Biological Classification System



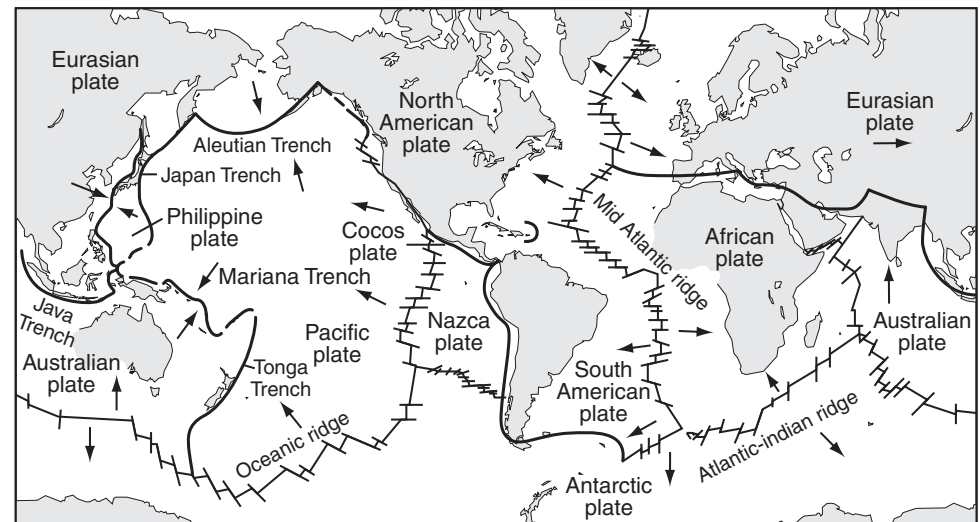
Standard Units of Measurement

| Quantity | Unit (abbreviation) |
|-------------|----------------------|
| mass | kilogram (kg) |
| volume | liter (L) |
| temperature | degrees Celsius (°C) |
| time | second (s) |
| distance | meter (m) |
| force | newton (N) |
| energy | joule (J) |

Useful Formulas

| | | | |
|--|-------------------|--|--|
| $F = ma$ | $m = \frac{F}{a}$ | $a = \frac{F}{m}$ | $F = \text{force}$ $m = \text{mass}$ $a = \text{acceleration}$ |
| $D = \frac{m}{V}$ | $V = \frac{m}{D}$ | $m = D \times V$ | $D = \text{density}$ $m = \text{mass}$ $V = \text{volume}$ |
| $s = \frac{d}{t}$ | $t = \frac{d}{s}$ | $d = st$ | $s = \text{speed}$ $d = \text{distance}$ $t = \text{time}$ |
| $^{\circ}\text{C} = \left(\frac{5}{9}\right) \times (^{\circ}\text{F} - 32)$ | | $^{\circ}\text{F} = \left(\frac{9}{5}\right) \times ^{\circ}\text{C} + 32$ | |

Plate Movements



PERIODIC TABLE OF THE ELEMENTS

| Group → | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|--------------------------|----------------------------------|----------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|-------------------------------------|---------------------------------|-------------------------------------|----------------------------------|------------------------------------|-------------------------------|
| Period ↓ | I A | II A | | | | | | | | | | | III A | IV A | V A | VI A | VII A | VIII A |
| 1 | Hydrogen H 1.008 | | | | | | | | | | | | | | | | | Helium He 4.003 |
| 2 | Lithium Li 6.941 | Beryllium Be 9.012 | | | | | | | | | | | Boron B 10.811 | Carbon C 12.011 | Nitrogen N 14.007 | Oxygen O 15.999 | Fluorine F 18.998 | Neon Ne 20.180 |
| 3 | Sodium Na 22.990 | Magnesium Mg 24.305 | | | | | | | | | | | Aluminum Al 26.982 | Silicon Si 28.086 | Phosphorus P 30.974 | Sulfur S 32.066 | Chlorine Cl 35.453 | Argon Ar 39.948 |
| 4 | Potassium K 39.098 | Calcium Ca 40.078 | Scandium Sc 44.956 | Titanium Ti 47.88 | Vanadium V 50.942 | Chromium Cr 51.996 | Manganese Mn 54.938 | Iron Fe 55.847 | Cobalt Co 58.933 | Nickel Ni 58.693 | Copper Cu 63.546 | Zinc Zn 65.39 | Gallium Ga 69.723 | Germanium Ge 72.61 | Arsenic As 74.922 | Selenium Se 78.96 | Bromine Br 79.904 | Krypton Kr 83.80 |
| 5 | Rubidium Rb 85.468 | Strontium Sr 87.62 | Yttrium Y 88.906 | Zirconium Zr 91.224 | Niobium Nb 92.906 | Molybdenum Mo 95.94 | Technetium Tc 97.907 | Ruthenium Ru 101.07 | Rhodium Rh 102.906 | Palladium Pd 106.42 | Silver Ag 107.868 | Cadmium Cd 112.411 | Indium In 114.82 | Tin Sn 118.710 | Antimony Sb 121.757 | Tellurium Te 127.60 | Iodine I 126.904 | Xenon Xe 131.290 |
| 6 | Cesium Cs 132.905 | Barium Ba 137.327 | Lanthanum La 138.906 | Hafnium Hf 178.49 | Tantalum Ta 180.948 | Tungsten W 183.84 | Rhenium Re 186.207 | Osmium Os 190.2 | Iridium Ir 192.22 | Platinum Pt 195.08 | Gold Au 196.967 | Mercury Hg 200.59 | Thallium Tl 204.383 | Lead Pb 207.2 | Bismuth Bi 208.980 | Polonium Po 208.982 | Astatine At 209.978 | Radon Rn 222.018 |
| 7 | Francium Fr 223.020 | Radium Ra 226.025 | Actinium Ac 227.028 | Rutherfordium Rf (261) | Dubnium Db (262) | Seaborgium Sg (263) | Bohrium Bh (262) | Hassium Hs (265) | Meitnerium Mt (266) | | | | | | | | | |
| Lanthanide Series | | | | Serium Ce 140.115 | Praseodymium Pr 140.908 | Neodymium Nd 144.24 | Promethium Pm 144.913 | Samarium Sm 150.36 | Europium Eu 151.965 | Gadolinium Gd 157.25 | Terbium Tb 158.925 | Dysprosium Dy 162.50 | Holmium Ho 164.930 | Erbium Er 167.26 | Thulium Tm 168.934 | Ytterbium Yb 173.04 | Lutetium Lu 174.967 | |
| Actinide Series | | | | Thorium Th 232.038 | Protactinium Pa 231.038 | Uranium U 238.029 | Neptunium Np 237.048 | Plutonium Pu 244.064 | Americium Am 243.061 | Curium Cm 247.070 | Berkelium Bk 247.070 | Californium Cf 251.080 | Einsteinium Es 252.083 | Fermium Fm 257.095 | Mendelevium Md 258.099 | Nobelium No 259.101 | Lawrencium Lr 260.105 | |

Name — Hydrogen

Atomic Number — 1

Symbol — **H**

Atomic Mass — 1.008