



LOG 2: Mission to Mars: Just ask the Data!

| | Earth | Mars | Luna (Moon) |
|----------------------|--|---|-------------------------|
| Comparative mass | 1.00 | 0.107 | 0.0123 |
| Diameter | 12,756 km | 6,787 km | 3,476 km |
| Surface Gravity | 1.0 | 0.38 | 0.166 |
| Density | 1.0 | 0.71 | 0.6 |
| Escape velocity | 40,300 km/hr. | 18,000 km/hr. | 8, 570 km/hr. |
| distance from Sun | 1 AU | 1.524 AU | 384,000 km (from Earth) |
| Rotation period | 23.93 hr. | 24.66 hr. | 27.32 Earth days |
| Revolution period | 365.26 Earth days | 686.98 Earth days | 27.32 Earth days |
| Surface Temperature | 13 °C (| -57 °C (-70°) | -30 °C (-22°F) |
| Atmosphere | 78% nitrogen 21% oxygen 1% argon 0.035 % carbon dioxide | 95% carbon dioxide 3% nitrogen 1.6% argon 0.13% oxygen | negligible |
| Atmospheric pressure | 101.3 kPa | 0.7 kPa | 0.0 kPa |

FACTS you will need

1. Earth's mass is 5.98×10^{24} kg
2. One Astronomical Unit is the distance between Earth and Sun or 150,000,000 km
3. Speed of Light: 186,000 miles per second, 300,000 kilometers per second.
4. NASA Mars 2020 Perseverance Cruising at 24,600 MPH on Its 300 Million Mile Journey to Mars (483 million kilometers).

What you can learn from the data above

1. **SIZE:** Rounding off the numbers, how much larger is Earth than Mars, than the Moon?
2. **ESCAPE:** How much faster must you travel to leave Earth than to leave Mars or the Moon?
3. **WEIGHING YOURSELF:** Multiply your weight in pounds on Earth by the surface gravity of the Moon and Mars. That is your new weight.
4. **AGE:** How old would you be in Mars years?
(HINT: A Mars year is about twice as long as an Earth year)
5. **DISTANCE:** How close do Earth and Mars come to each other? How far can they be apart?
6. **CALLING HOME:** Radio communication travels at the speed of light. How long does it take a message to go to the Moon? To go to Mars when it is close? To go to Mars when it is farthest away?
7. **MAKING THE JOURNEY:** Based on the data from the Perseverance Rover, how long is a trip to Mars traveling at Perseverance speed? Why does it take so long?
8. **AIR:** Compare the atmospheric pressure on Earth and Mars.