**Applications with Unit Analysis & Order of Operations**

1. The formula for the surface area of a sphere is SA = 4πr2 where *r* is the radius of the sphere. The radius of the earth is 6,378.14 km. Find the surface area. Label your answer with appropriate units.
2. What operation do you do first in evaluating the formula in #17?
3. Approximately 29% of the surface area of the earth is land.
   1. What is the area of the land on the earth?
   2. Based on the information given, what percentage of the earth is covered by water?
   3. What is the area covered by water?
4. The table below shows 2010 estimates for the populations of the continents of the earth (source: Nations Online Project). First, write the number in words (example shown). Second, calculate the percentage that each continent’s population is of the total world population. Show your work in the space given.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Continent** | **Population** | | **Work** | **Percentage** |
| Europe | 727,100,000 | |  |  |
| **Example**  In words:  727 million, 100 thousand | | |
| Asia | 4,157,000,000 | |  |  |
| In words: | | |
| Africa | 1,030,000,000 | |  |  |
| In words: | | |
| North America | 344,000,000 | |  |  |
| In words: | | |
| South America | 586,000,000 | |  |  |
| In words: | | |
| Oceania (Australia and surrounding islands) | | 31,000,000 |  |  |
| In words: | | |

**Theme Application**

To answer Dr. Bartlett’s question: “Given current rates of population growth, how long would it take for there to be one person for each square meter of land on the earth?”, we need to find the area of the land covering the earth in square meters.

1. A *square kilometer* (km2) is a square that measures one kilometer by one kilometer. A *square meter* (m2) is a square that measures one meter by one meter. There are 1,000 meters in one kilometer. How many square meters are in one square kilometer?
2. Use your answer above and question #3 to calculate the area of land on the earth in square meters.