

## Answer on Question #65102 – Math – Algebra

### Question

How many grains of rice would it take to cover Florida one meter deep?

### Solution

The total area of Florida [1] is

$$S = 170,304 \text{ km}^2 = 17,0304 \cdot 10^7 \text{ m}^2.$$

We have to cover it with rice volume

$$V = S \cdot h,$$

where  $h = 1\text{m}$ .

Thus,

$$V = 17,0304 \cdot 10^7 \text{ m}^3.$$

Bulk density of hulled and polished rice [2] is

$$\rho = 769 \text{ kg/m}^3.$$

So, the total mass of rice is

$$m = \rho \cdot V = 769 \cdot 17,0304 \cdot 10^7 = 13,0963776 \cdot 10^{10} \text{ kg}.$$

Rice grains vary widely. One grain of long-grain rice weighs about 1/64 of a gram [3].

It is equal to

$$m_0 = \frac{1}{64} \cdot 10^{-3} \text{ kg}.$$

Thus, the number of grains of rice would be

$$N = \frac{m}{m_0} = \frac{13,0963776 \cdot 10^{10}}{\frac{1}{64} \cdot 10^{-3}} = 838,1681664 \cdot 10^{13}.$$

**Answer:** The approximate number of grains of rice is  $838,1681664 \cdot 10^{13}$ .

### References

[1] Reference Map of Florida. Retrieved from

[http://www.nationsonline.org/oneworld/map/USA/florida\\_map.htm](http://www.nationsonline.org/oneworld/map/USA/florida_map.htm)

[2] Bulk Density Averages. Retrieved from

<http://go.key.net/rs/key/images/Bulk%20Density%20Averages%20100630.pdf>

[3] How much does a single grain of rice weigh? Retrieved from

<https://www.reference.com/food/much-single-grain-rice-weigh-c39a20469d3fe660>