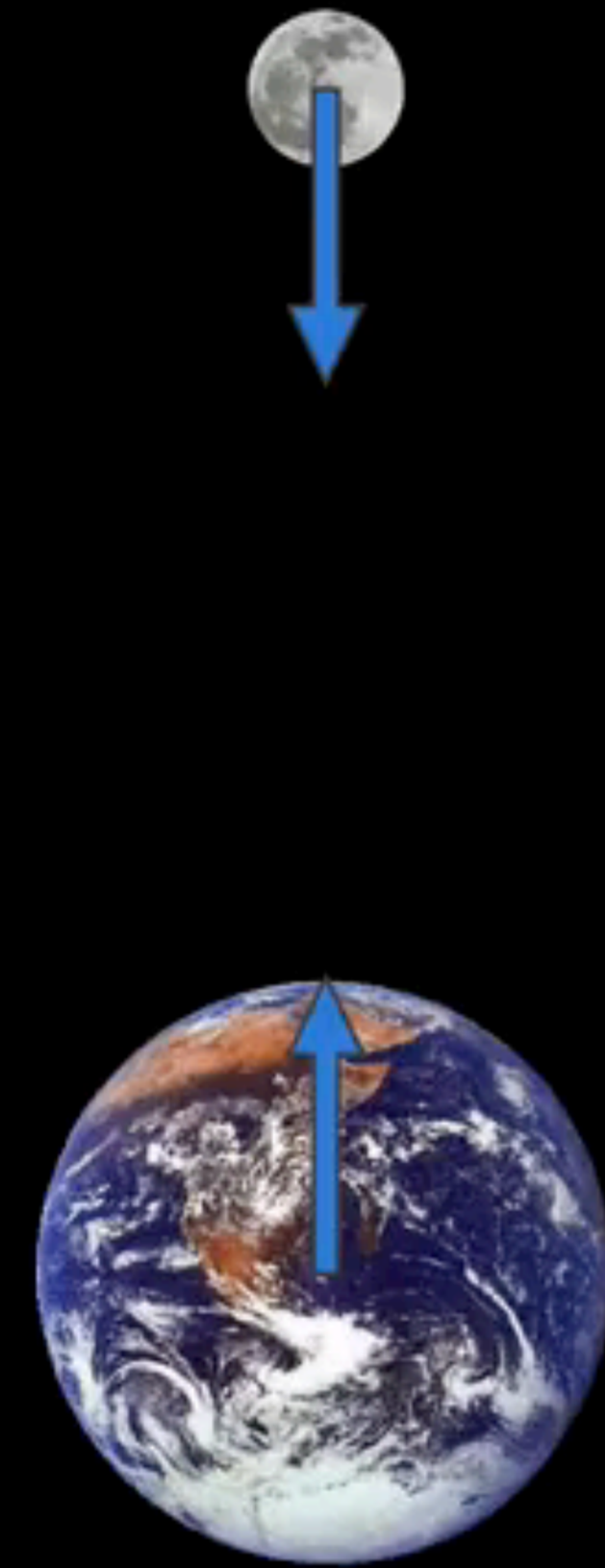


Gravitational Field Strength

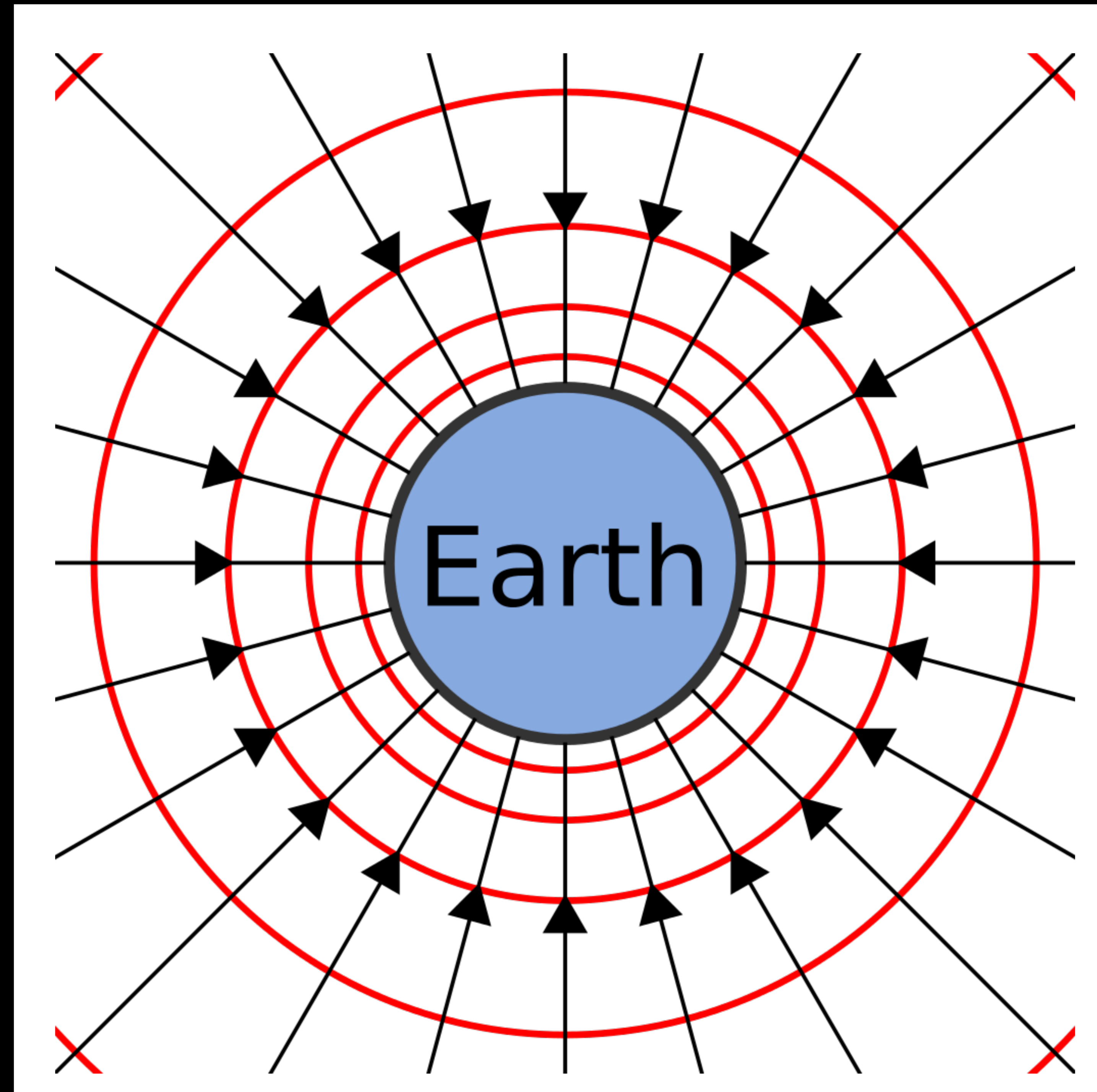


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AP Physics 1

Physics Essentials - 025

Gravitational Field





Mass

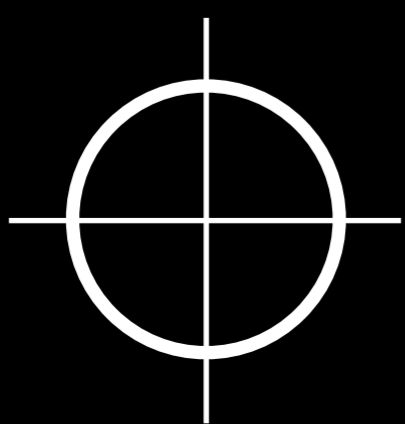
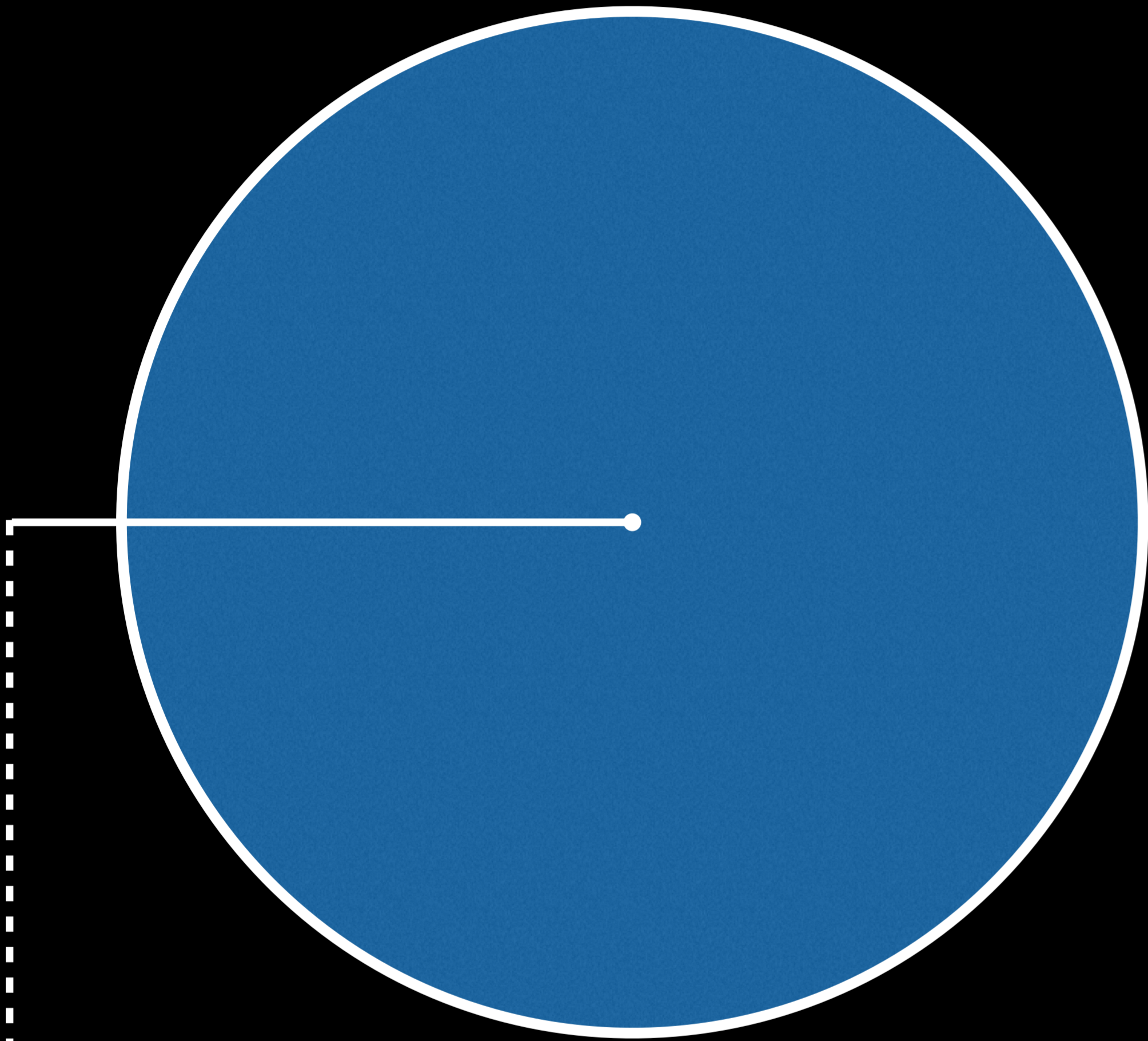
Radius

$$g = G \frac{M}{r^2}$$

Calculate

Gravitational constant

Gravitational Field Strength



$$g = G \frac{M}{r^2}$$

mass

$6.67 \times 10^{-11} \text{ N} \cdot (\text{m}/\text{kg})^2$

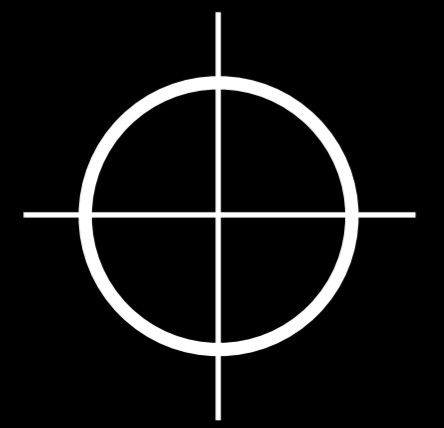
radius

$$g = G \frac{M}{r^2}$$

$$G = 6.67 \times 10^{-11} \text{ N} \cdot (\text{m}/\text{kg})^2$$



2.0 m



$$g = 6.67 \times 10^{-11} \text{ N} \cdot (\text{m}/\text{kg})^2 \frac{.145 \text{ kg}}{(2.0 \text{ m})^2}$$

$$= 2.4 \times 10^{-12} \text{ N}/\text{kg}$$

$$G = 6.67 \times 10^{-11} \text{ N} \cdot (\text{m}/\text{kg})^2$$

$$6.37 \times 10^6 \text{ m}$$

$$g = G \frac{M}{r^2}$$



$$5.97 \times 10^{24} \text{ kg}$$

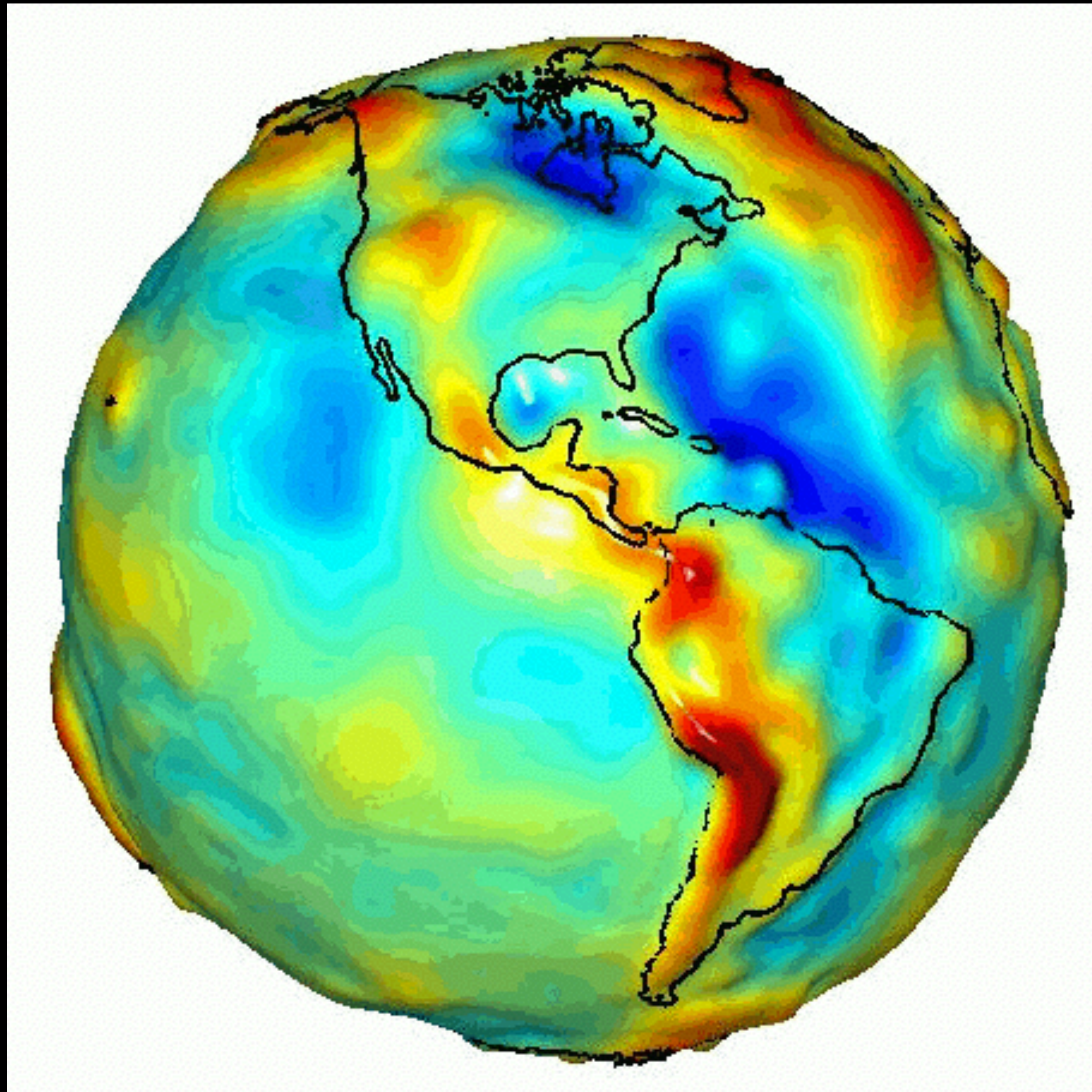
$$g = 6.67 \times 10^{-11} \text{ N} \cdot (\text{m}/\text{kg})^2 \frac{5.97 \times 10^{24} \text{ kg}}{(6.37 \times 10^6 \text{ m})^2}$$

$$= 9.81 \text{ N}/\text{kg}$$

$$g = 6.67 \times 10^{-11} \text{ N} \cdot (\text{m}/\text{kg})^2 \frac{5.97 \times 10^{24} \text{ kg}}{(6.37 \times 10^6 \text{ m})^2}$$

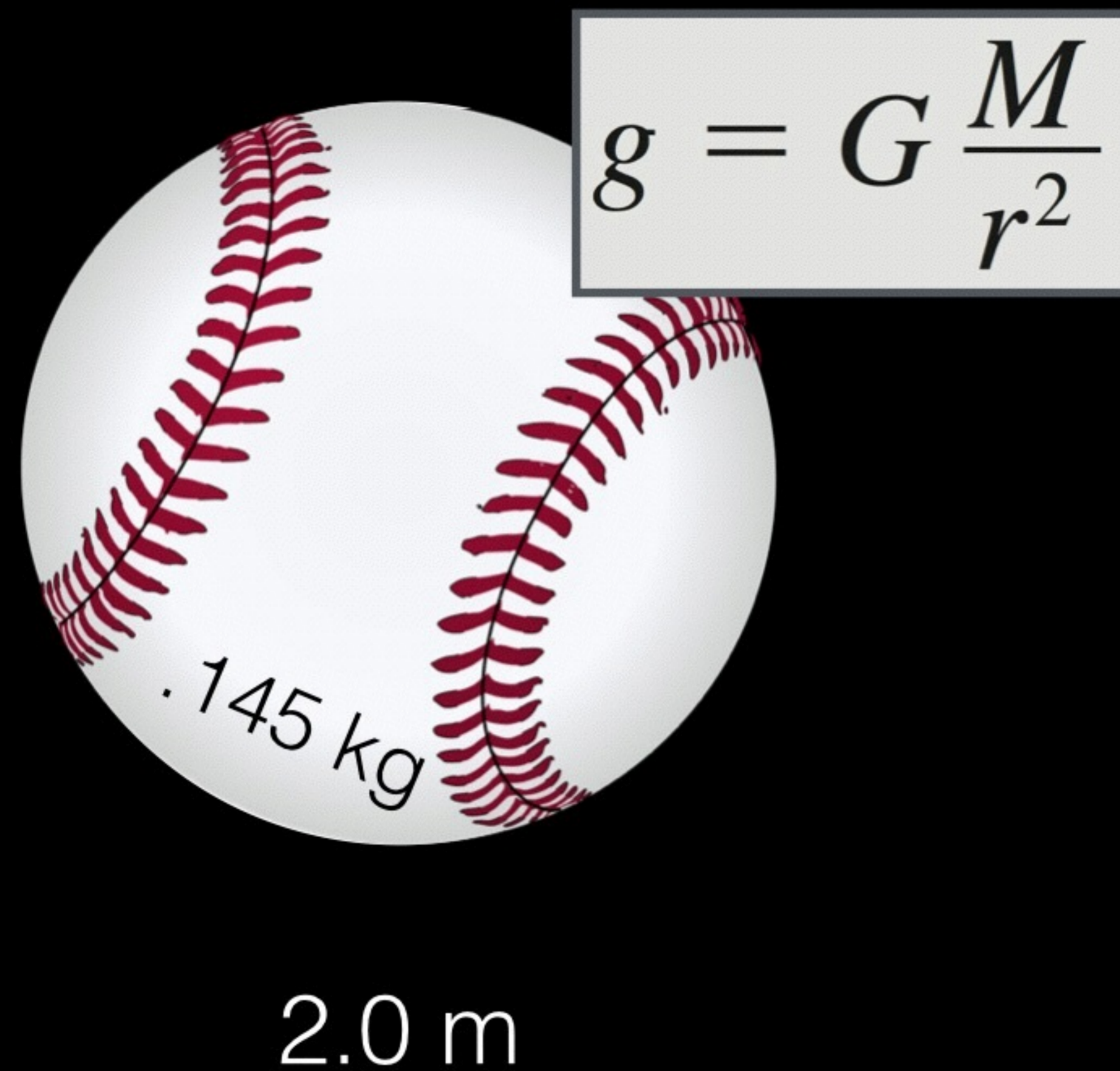


$$= 9.81 \text{ N}/\text{kg}$$



Actual Field Strength

Did you learn?



To calculate the gravitational field strength of an object with a mass of M .

Did you learn?



To approximate the gravitational field strength near the surface of an object.

Acknowledgements

"File:GRACE Globe Animation.gif." Wikipedia, the Free Encyclopedia. Accessed May 22, 2014. http://en.wikipedia.org/wiki/File:GRACE_globe_animation.gif.

"Gravity and Orbits." PhET. Accessed May 22, 2014. <http://phet.colorado.edu/en/simulation/gravity-and-orbits>.

Sjlegg. English: Gravitational Field Lines and Equipotentials (red) around the Earth., May 9, 2009. Own work. http://commons.wikimedia.org/wiki/File:Gravitational_field_Earth_lines equipotentials.svg.



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