



1. A bench in a roadside diner in Squamish, BC has a mass of 21 kg. What is the weight of the bench?

$$F = mg$$

$$= 21 \times 9.8$$

$$= 205.8 \text{ N}$$

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2. A boulder weighs 121,459 N in Flin Flon, Manitoba. What is the mass of the boulder?

$$F = mg$$

$$121\,459 = m(9.8)$$

$$m = 12\,394 \text{ kg}$$

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3. A button accordion has a weight of 31 N on the moon ($g = 1.62 \text{ N/kg}$). What is the mass of the accordion?

$$F = mg$$

$$31 = m(1.62)$$

$$m = 19.1 \text{ kg}$$

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4. A silver fidget spinner has a mass of 128 g in St. John's, Newfoundland. What is the mass of the fidget spinner on the moon?

The same!

$$128 \text{ g}$$

5. A large chocolate fondue fountain is transported to a distant planet because aliens need fondue too. If the weight of the fountain on Earth is 705.6 N and it is 426 N on the planet, what is the strength of the gravitational field on the planet?

Earth

$$F = mg$$

$$705.6 = m(9.8)$$

$$m = 72 \text{ kg}$$

Planet

$$F = mg$$

$$426 = 72(g)$$

$$g = 5.92 \frac{\text{N}}{\text{kg}}$$

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6. A bronze statue has a weight of 945 N on Earth and is flown to Mars, where $g = 3.72 \text{ N/kg}$. What is the weight of the statue on Mars?

Earth

$$F = mg$$

$$945 = m(9.8)$$

$$m = 96.4 \text{ kg}$$

$$F = mg$$

$$= 96.4(3.72)$$

$$F = 359 \text{ N}$$

$$359 \text{ N}$$

7. An antique sewing machine is found in a cave on a distant exoplanet. How effectively does this prove the existence of aliens? Sew sew. If the weight of the sewing machine is 150 N and the strength of its gravitational field is 28% that of Earth, what is the mass of the sewing machine?

$$9.8 \times 0.28 = 2.744 \frac{\text{N}}{\text{kg}}$$

$$F = mg$$

$$150 = m(2.744)$$

$$m = 55 \text{ kg}$$