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- One of the most confusing aspects of orbital motion is the concept of weightlessness.
- Frequently people interpret this as implying the absence of the gravitational force.
- Certainly this can not be the case since the gravitational force scales as 1/r<sup>2</sup> and is thus not that different from the force we feel on the surface on the earth.

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## Orbital motion and weightlessness.

- We experience apparent weightlessness anytime we fall with the same acceleration as our surroundings.
- Consider a falling elevator. Every object in the elevator will fall with the same acceleration, and the elevator will not need to exert any additional forces, such as the normal force, on those inside it.



• It appears as if the objects in the elevator are weightless (in reality they of course are not).

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a = g(down)











































