Name

Date _

Period

Center of Mass

FORCE

Objects don't have their mass distributed evenly. Archimedes, an ancient Greek mathematician, showed that the effect on rigid bar by weights resting at various points along it is the same as it would be if all the weights were moved to a single point. This point is called the **center of mass** or the **center of gravity**. If you try to balance an object, it will only balance over its center of mass. The center of mass of a system of particles is a specific point at which the system's mass behaves as if it were concentrated. In the case of a rigid body, its position is fixed in relation to the object (but not necessarily in contact with it). The geometric center of an object is not necessarily its center of mass. It is easiest to interpret the way an object responds to forces by looking at the behavior of the center of mass. This makes it a very significant point to engineers. Engineers try to design a sports car so its center of gravity is as low as possible to make the car handle better. For a plane to be safe to fly, the center of gravity should be about one quarter of the way from the wing leading edge to the wing trailing edge.

Answer the questions below based on your reading above and on your understanding of the center of mass.

- 1. Based on the location of the center of mass of the bowling pin pictured to the right, will it fall or stand?
- 2. The meter stick pictured below has two identical lead weights hanging on it, one at 10 cm and one at 50 cm.

If the mass of the meter stick itself is very low, where, approximately, is the center of mass?

3. Which of the two vehicles pictured to the right is least likely to tip over going around

a sharp curve? Why?

4.

If an object's mass is distributed evenly, where is its center of mass?	

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