The objects listed below are placed in an oven heated to 90 C (~160 F) and left for a long time.
Which object will feel warmest when you touch it?

A. A ball of cotton
B. A stick of wood
C. A metal bar
D. They would all feel the same

The objects listed below are placed in an oven heated to 90 C (~160 F) and left for a long time. Which object will have the highest temperature?

A. A ball of cotton
B. A stick of wood
C. A metal bar
D. They would be the same temperature

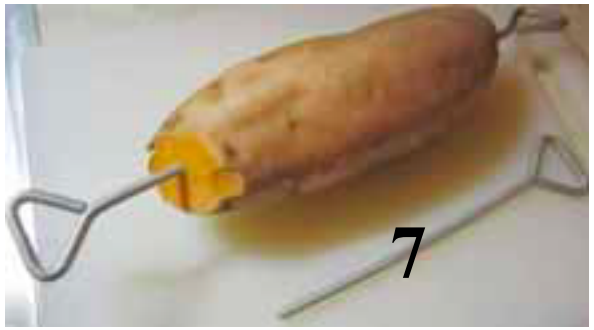
When baking a potato (white or sweet) in the oven, I find they come out much more uniformly cooked if I stick aluminum rods into the potato. (You can buy such rods in any kitchen supply store.)Why do you think this works?

A. Because the aluminum has a much higher specific heat than the potato and so it holds a lot of thermal energy.

B. Because the aluminum has a much lower specific heat than the potato and so it lets the potato have most of the thermal energy.

C. Because the aluminum has a much higher thermal conductivity than the potato so putting the rods in brings the thermal energy into the center of the potato more quickly so it cooks more uniformly.

D. Some other reason.



When I bake a sweet potato in the oven, I always put it on a thin sheet of aluminum foil. This is because sometimes the potato exudes a sugary juice that burns and makes a hard-to-clean-up mess if it drips on the bottom of the oven. When I'm ready to take the potato out of the hot (400^{o} F) oven after an hour of cooking, I find I can pick up the aluminum foil with my bare hands without getting burned. Why do you think this is so?

A. Because the aluminum foil has a high specific heat so that it holds on to most of the thermal energy.
B. Because the aluminum foil has a low specific heat and not much mass, so even at a high temperature it doesn't have a lot of thermal energy in it to burn me.
C. Because the aluminum foil has a low thermal conductivity so that although the foil is hot, the heat doesn't flow into my hand.
D. Because the aluminum foil doesn't get hot in the oven, even though the oven is at a high temperature.
E. Some other reason.

The Gauss gun

Spheres numbered 1, 2, and 3 all "stick" when added one at a time. Which is more tightly bound?

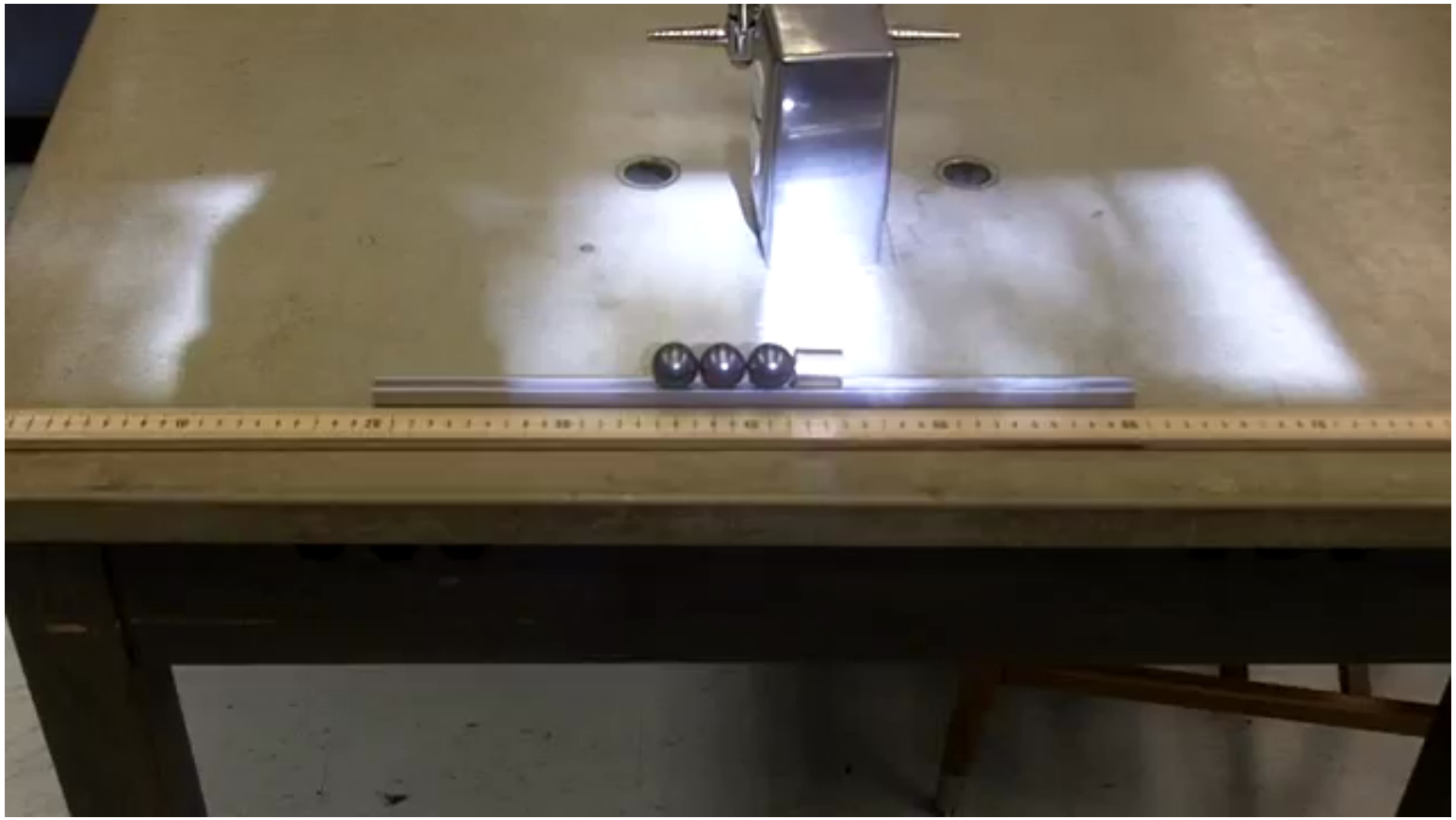
1. Sphere 1
   (when 2 and 3 are NOT there)
2. Sphere 3
   (when 1 and 2 ARE there)
3. They will be the same.

The Gauss gun

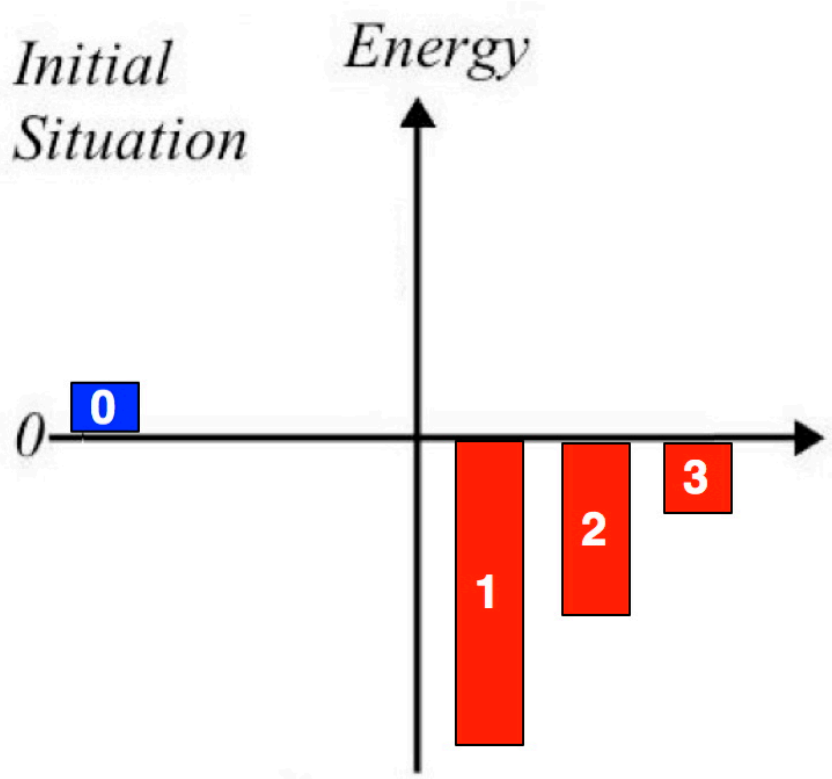
When sphere 0 is released it is attracted to the magnet and begins to speed up. What do you think will happen when it hits the magnet?

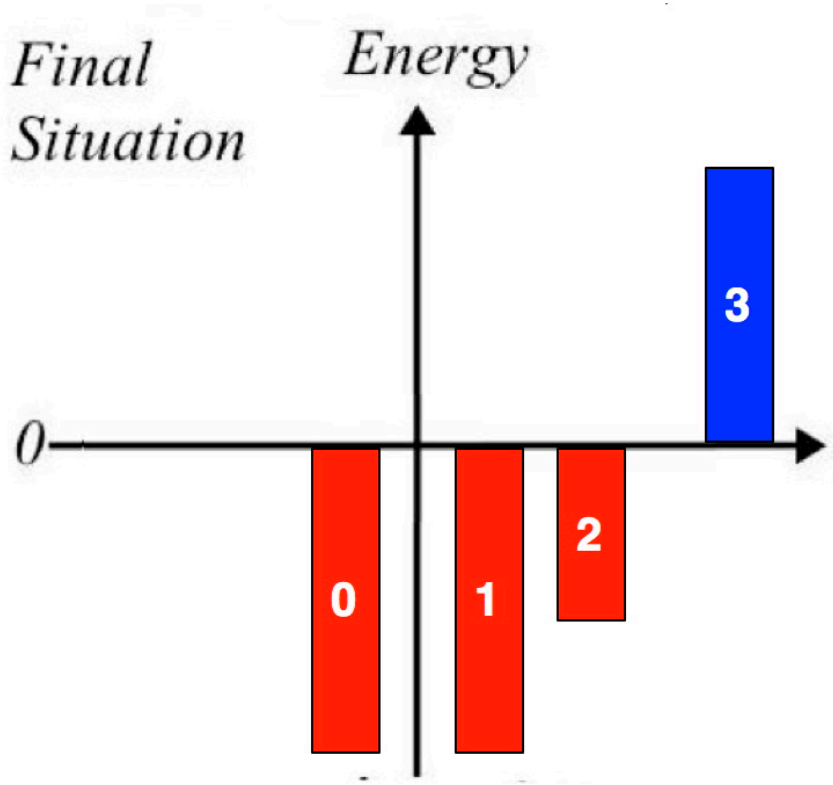
1. Sphere 0 will stick. Nothing else will happen.
2. Sphere 3 will be kicked off at the same speed that sphere 0 hit with and will slow down to a stop – reversing what 0 did as it approached.
3. Something else will happen. (What?)

The Gauss Gun



How does this happen?





+1-10-5-2= -16

KE-10-10-5= -16

KE = -16 +25 = +9

A gas is held behind a partition in an insulated chamber, the other side of the partition is vacuum. The partition breaks involving negligible energy change.
What happened after equilibrium is reached?

	$\Delta U_{\text{internal}}$	Q (heat absorbed BY the system)	W (work done BY the system)
1	> 0	0	< 0
2	< 0	0	> 0
3	0	> 0	> 0
4	> 0	> 0	0
5	< 0	> 0	> 0
6	0	< 0	> 0
7	> 0	< 0	< 0
8	< 0	< 0	0
9	0	0	0

An inflated balloon is place in a vacuum chamber and some of the air removed. The balloon grows substantially in size. What happened to the energies of the air inside the balloon?

	$\Delta U_{\text{internal}}$	Q (heat absorbed BY the system)	W (work done BY the system)
1	> 0	0	< 0
2	< 0	0	> 0
3	0	> 0	> 0
4	> 0	> 0	0
5	< 0	> 0	> 0
6	0	< 0	> 0
7	> 0	< 0	< 0
8	< 0	< 0	0
9	0	0	0