Air is a mixture of (mostly) oxygen (molecular mass 16) and nitrogen (molecular mass 14) gases. At room temperature, which molecules in this room have more kinetic energy (on average)?

1. Oxygen
2. Nitrogen
3. Same
4. Not enough information to tell

Air is a mixture of (mostly) oxygen (molecular mass 16) and nitrogen (molecular mass 14) gases. At room temperature, which molecules in this room have a greater speed (on average)?

1. Oxygen
2. Nitrogen
3. Same
4. Not enough information to tell

Egg placed in boiling water

	$\Delta U_{internal}$	**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

Man stands still holding a weight at arm's length.

	$\Delta U_{internal}$	**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

Flashlight left on

	$\Delta U_{internal}$	**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

Gas 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?

	$\Delta U_{internal}$	**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

During soccer practice one of your teammates sprains her ankle. You take an "instant cold pack" from the first aid box to use on her ankle. It is not at all cold when you take it out. The instructions on the cold pack tell you to punch the pack so that you break open a sack of chemicals inside it. When you do that you notice that the cold pack rapidly becomes quite cold. What happened?

1. By punching the pack you gave the chemicals inside the energy they needed to permit the cooling down.
2. A chemical reaction produced cold as one of its products, which cooled down the cold pack.
3. The cold pack forcefully expelled heat into its surroundings, which lowered its temperature.
4. Thermal energy was used up in forming chemical bonds, which made the cold pack colder.
5. More than one of these
6. None of these