Jet Propulsion

If you blow up a balloon and let it go without tying it, the balloon flies away. The shrinking balloon forces air out the opening. But when the balloon pushes on the air, the air pushes back causing the balloon to move. A jet and a rocket ship move in much the same way. When the fuel in a jet engine or a rocket ship burns, hot gases are released that expand and press against the walls of the chamber. According to Newton's Third Law, the chamber pushes back against the fuel. If there is an opening at one end of the chamber, the expanding gases move out. In order for the molecules to move out of the chamber there must be a net (unbalanced) force. In response, there is a net reaction force at the other end of the chamber. This causes the jet or the rocket ship to move in the opposite direction of the escaping, hot gas molecules.

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

1. Why does an untied, blown up balloon fly away when you let go? _____

2. A sprinter pushes off against the ground in order to sprint ahead. What do the hot gases of a rocket ship press against in order to get the rocket ship moving? _____

3. Describe how a jet engine works? _____

4. State the law of physics that explains how balloons, jets, and rocket ships fly. _____