

Question:

Water pours weakly from an open hose but sprays hard when you cover most of the end with your thumb. When in more water coming out of the hose?

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- Fluid has viscosity.
 - Fluid at walls is stationary.
 - Remaining fluid experiences viscous forces.

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- Poiseuille's law:

$$\text{Flow} = \frac{\pi \cdot \text{Pressure Difference} \cdot \text{Pipe Diameter}^4}{128 \cdot \text{Length} \cdot \text{Viscosity}}$$

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- Faster flow leads to more viscous losses.
- Faster flow causes quicker drop in pressure.

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- Turbulent Flow
 - Nearby regions of fluid become separated.
 - Inertia dominates flow.

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- Moving fluids can be hard to stop.