**Cooperative**

$$\frac{dx}{dt}=ax+bxy$$

$$\frac{dy}{dt}=cy+dxy$$

**Competitive**

$$\frac{dx}{dt}=ax-bxy$$

$$\frac{dy}{dt}=cy-dxy$$

**Predator-Prey**

 $\frac{dx}{dt}=ax+bxy$ or $\frac{dx}{dt}=ax-bxy$

 $\frac{dy}{dt}=cy-dxy$ $\frac{dy}{dt}=cy+dxy$

**Higher Degree Terms**

$$\frac{dx}{dt}=ax+bx^{2}+cxy$$

$$\frac{dy}{dt}=fy-gxy$$

Outside source can affect one or both systems and you must identify which population it affects

You must also identify if it is a competitive, cooperative or predator-prey type of system

**Another way to write it**



