**Harold’s Physics Doppler Effect**

**“Cheat Sheet”**

19 April 2016

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| **Doppler Effect – Sound** | | | |
| Diagram |  | | |
| [343.2 m/s; 1,126 ft/s; 1,236 km/h; 768 mph]  / receiver | **Source Velocity ()** | **Receiver Velocity ()** | **Observed Frequency Equation** |
| Source and receiver are both stationary | • | • |  |
| Source moving away from the receiver | ← | • |  |
| Source moving towards the receiver | → | • |  |
| Receiver moving towards the source | • | ← |  |
| Receiver moving away from the source | • | → |  |
| **General Equation** | ← → | ← → |  |
| **Tip:** Towards use top sign, away use bottom sign  Pick sign so observed frequency increases when towards (big numerator, small denominator) | | | |

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| **Doppler Effect – Light** | | | |
| http://a-levelphysicstutor.com/images/waves/dopp-redshift03.jpg | http://www.exploratorium.edu/hubble/tools/images/doppler1.gif | | |
|  | **Source Velocity Relative to Receiver ()** | **Receiver Velocity (0)** | **Observed Frequency Equation** |
| Both objects are moving at the same velocity | • | • |  |
| Redshift: Source object moving away from the earth | ← | • |  |
| Blueshift: Source object moving towards the earth | → | • |  |
|  |  | | |
|  | **Source Velocity Relative to Receiver ()** | **Receiver Velocity (0)** | **Observed Wavelength Equation** |
| Both objects are moving at the same velocity | • | • |  |
| Redshift: Source object moving away from the earth | ← | • |  |
| Blueshift: Source object moving towards the earth | → | • |  |