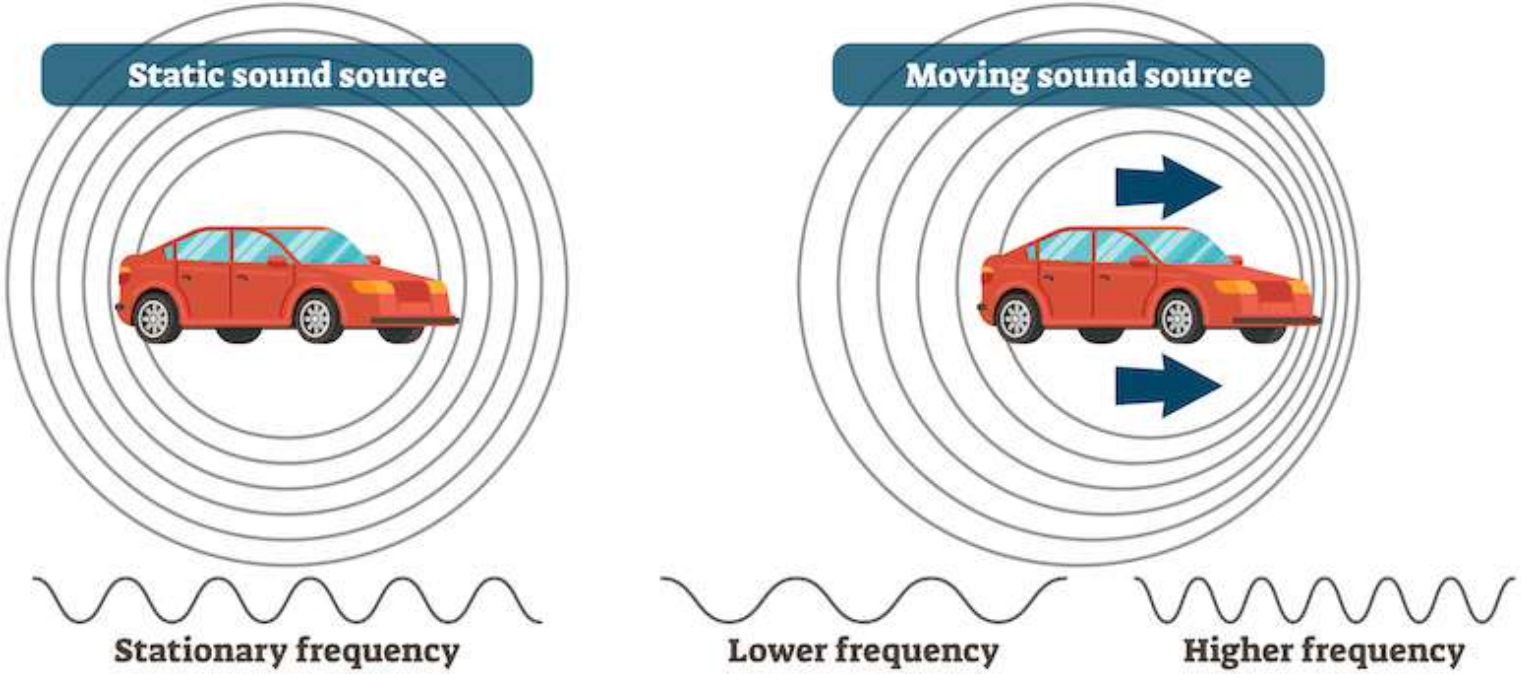
# Physics Honors:
# The Doppler Effect

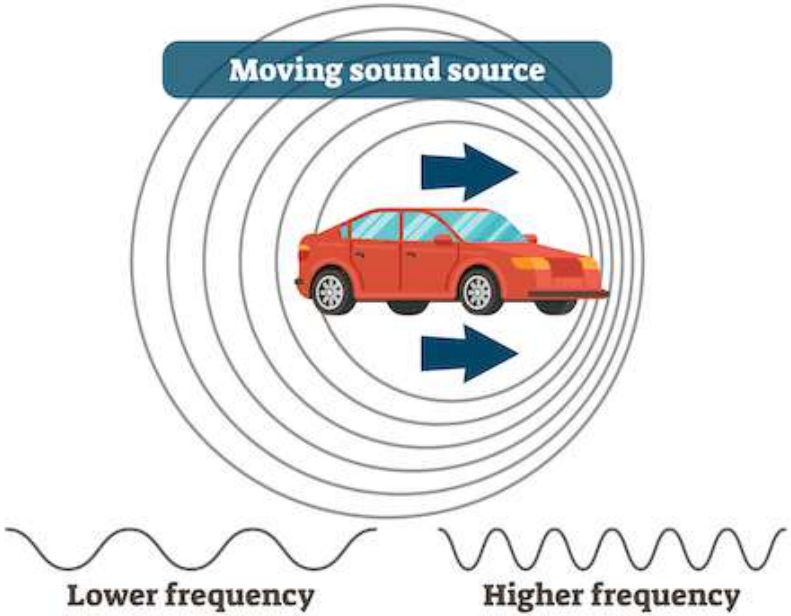
What sound does a car make when it drives past you? Why?



# The Doppler Effect

- As an object moves toward you, the wavelengths are compressed, making the pitch higher

- As it moves away from you, the wavelengths are expanded, making the pitch lower



# Equation

$$f_o = \frac{v + v_o}{v + v_s} f_s$$

$f_o$ = observer frequency of sound

$v$ = speed of sound waves

$v_o$ = observer velocity

$v_s$ = source velocity

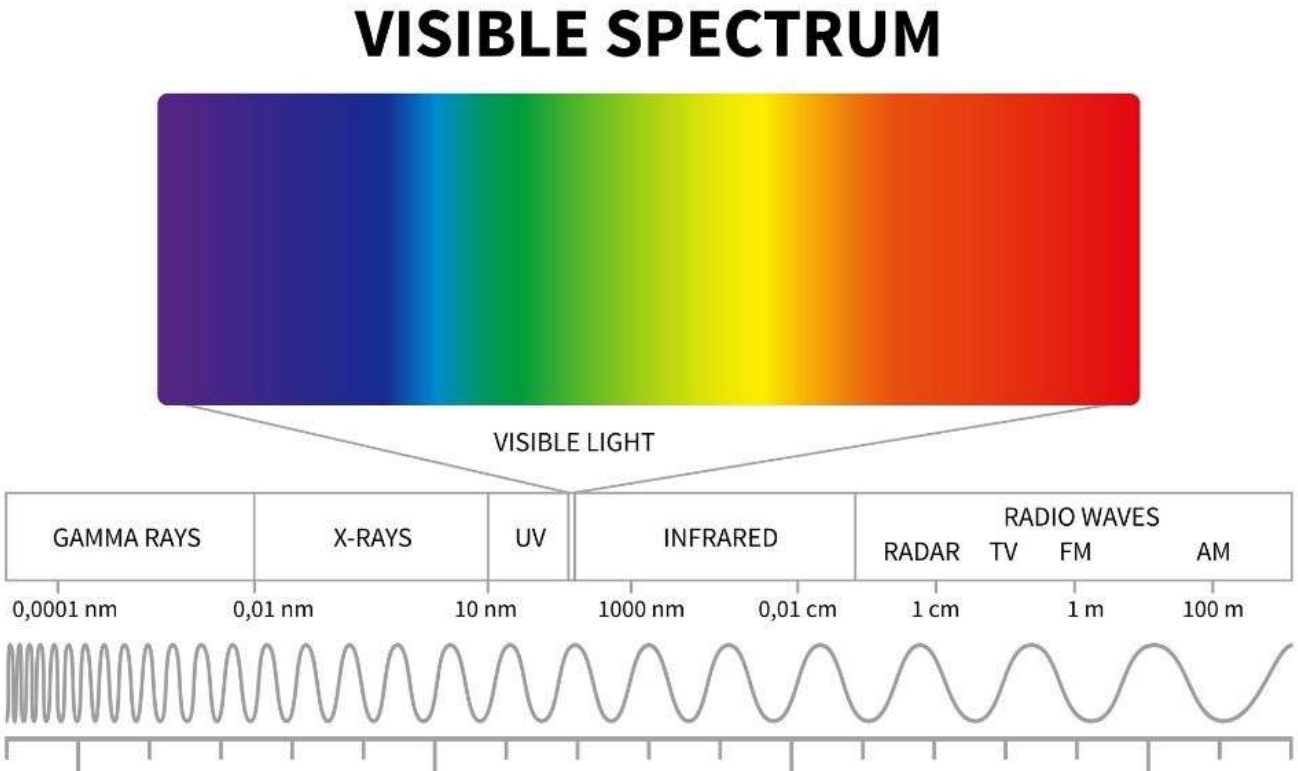
$f_s$ = actual frequency of sound waves

\+ Values for moving TOWARD
\- Values for moving AWAY

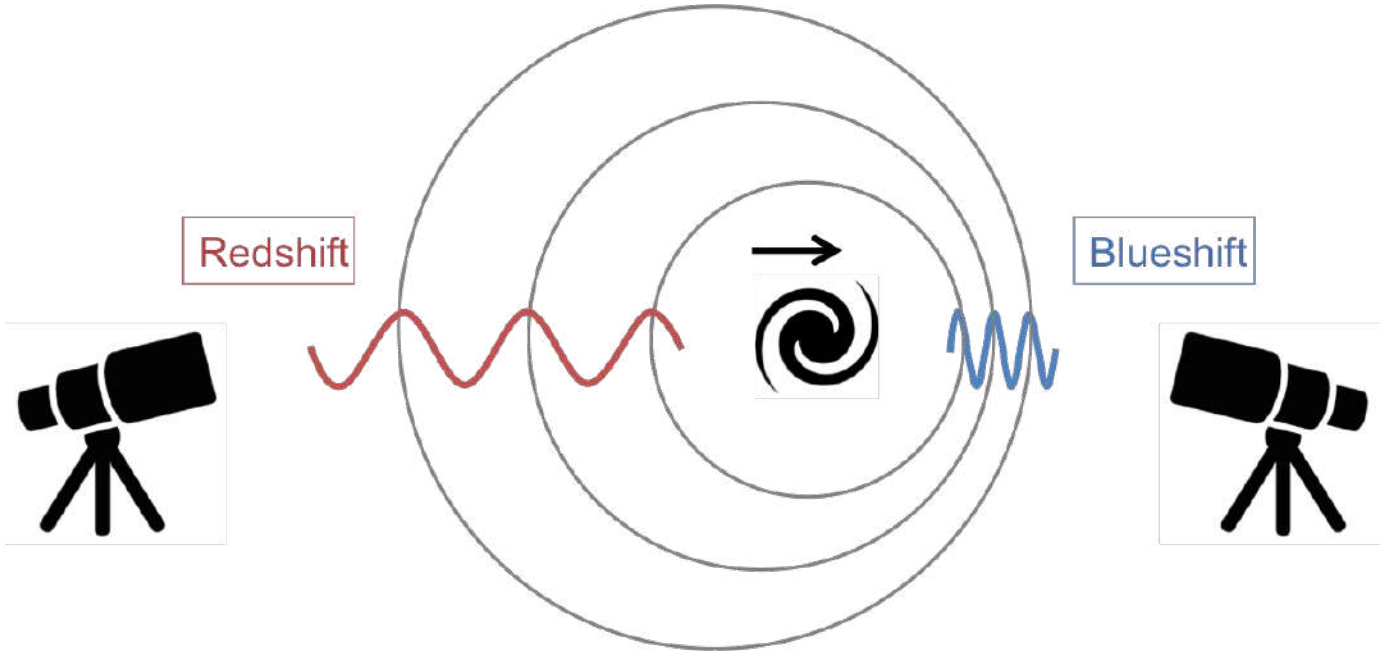
# Practice Problem

A guitar player plays the C above middle C (523 Hz) while traveling in a convertible at 24.6 m/s. If the car is coming toward you, what frequency would you hear? You are standing still.The speed of sound in air is 343 m/s.

# Application of Doppler Effect



# Redshift and Blueshift



# Ok, but how do we know what color a galaxy is SUPPOSED to be?