

**Science
Physics
Unit 5: Waves and Sound**

Essential Understandings	<ul style="list-style-type: none"> ▪ Causation: Nothing “just happens.” Everything is caused. ▪ Interrelatedness: Everything in the universe is connected to everything else in the universe. ▪ Dynamism: Everything is changing in some way all the time. ▪ Entropy: Change has direction. Generally, simple precedes complex. Generally, order changes toward disorder. ▪ Uniformitarianism: The way the universe works today is the way it worked yesterday and the way it will work tomorrow.
Essential Questions	<ul style="list-style-type: none"> ▪ How is energy transferred through wave motion? ▪ How is sound perceived and measured? ▪ How do waves interact with the media through which they pass?
Essential Knowledge	<ul style="list-style-type: none"> ▪ Waves transfer energy. ▪ Many components of the nature of sound are subjective. ▪ Vibration is the source of all wave motion.
Vocabulary	<ul style="list-style-type: none"> ▪ <u>Terms:</u> <ul style="list-style-type: none"> ○ amplitude, beats, bow wave, compression, constructive interference, destructive interference, Doppler Effect, forced vibration, frequency, hertz, infrasonic, interference pattern, longitudinal wave, natural frequency, period, pitch, rarefaction, resonance, shock wave, simple harmonic motion, sonic boom, standing wave, transverse wave, ultrasonic, vibration, wave, wavelength
Essential Skills	<ul style="list-style-type: none"> ▪ Determine the effects of interference. ▪ Use mathematics to calculate wave speed, frequency, and wavelength. ▪ Analyze the effects of relative motion between sound sources and sound observers.
Related Maine Learning Results	<p><u>Science and Technology</u> D. The Physical Setting D4. Force and Motion Students understand that the laws of force and motion are the same across the universe. d. Describe and apply characteristics of waves including wavelength, frequency, and amplitude. e. Describe and apply an understanding of how waves interact with other waves and with materials including reflection, refraction, and absorption.</p>
Sample Lessons And Activities	<ul style="list-style-type: none"> ▪ Word problem worksheets ▪ Wave and sound labs ▪ Lectures ▪ Sound and wave demonstrations ▪ Sound and wave videos
Sample Classroom	<ul style="list-style-type: none"> ▪ Chapter tests ▪ Quizzes

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Assessment Methods	▪ Laboratory reports
Sample Resources	▪ <u>Publications:</u> <ul style="list-style-type: none">○ <u>Physical Science</u> - Glencoe○ MARVEL Data bases○ GALE Resource Data bases ▪ <u>Videos:</u> <ul style="list-style-type: none">○ <u>The Mechanical Universe</u>