SIP RESOURCES

How do echoes occur and how are they used?

Key terms: echo, sonar. Real-world examples: Echoes in rooms, or acoustics, and outdoors. Also practical uses of echoes such as echolocation/navigation by bats and dolphins, ultrasound imaging, and SONAR

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What is sonar?

Sonar uses **sound waves** to 'see' in the water.

<http://oceanservice.noaa.gov/facts/sonar.html>

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| |  |  |  |  | | --- | --- | --- | --- | | |  | | --- | | [underwater conflict](https://www.exploratorium.edu/theworld/sonar/index.html) | | [how sonar works](https://www.exploratorium.edu/theworld/sonar/sonar.html)[hear the sounds](http://birds.cornell.edu/brp/SoundLFAandHB.html)[try this](https://www.exploratorium.edu/theworld/sonar/trythis.html)[animal navigation](https://www.exploratorium.edu/theworld/sonar/navigation.html)[links](https://www.exploratorium.edu/theworld/sonar/links.html) | | whale |   **How does sonar work?** |

<https://www.exploratorium.edu/theworld/sonar/sonar.html>

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# Bioacoustics Research Program

<http://www.birds.cornell.edu/page.aspx?pid=2713>

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SONAR AND MARINE MAMMALS FACT SHEET

<http://www.nmfs.noaa.gov/pr/pdfs/health/sonar_fact_sheet.pdf>

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Whale navigation

<http://www.pbs.org/kqed/oceanadventures/episodes/whales/indepth-navigation.html>

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Bats and echolocation

<http://www.bats.org.uk/pages/echolocation.html>

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# U.S. Navy enlists dolphins and sea lions to detect explosives and attackers

<https://newsela.com>

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Additionally, you can research acoustics in a room such as an auditorium.