

Waves, Fourier series and music

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The students for whom this activity is intended are completing a pure and applied science profile within the Natural Science program. They are enrolled in a 45-hour course on the integration of science.

The activity consists in using Fourier series as a unifying theme for several sections of the Natural Science program and as an introduction to music. Students must learn, both individually and as part of a team, about Fourier series and the Fourier theorem, using knowledge acquired in mathematics, computer science and physics. They then apply this knowledge to music and the technology of sound reproduction. Using Fourier series, they must also apply their knowledge of electricity to create filters and analyze their effects on sound.

The activity lasts approximately five weeks. The size of the group should not exceed 24 students. A considerable portion of the work is done in the physics and computer science laboratories.

Three other activities make up the course: the application of mathematics in physics, the construction of a radio and a PowerPoint presentation on a scientific topic.