

LEARNING SYNTHS PLAYGROUND

Navigate to the website “[Learning Synths Playground](https://learningsynths.ableton.com/en/playground)” made by Ableton. This website has a simple synthesizer instrument. But each of these modules is based on a math equation. (Those equations are shown below.) Play with the different sliders and see how the sound changes. Do some modules work together better than others? Why do you think that is the case? Write your answer on the back of this page.

The screenshot shows the 'Learning Synths Playground' interface with several mathematical equations overlaid on different modules:

- Square Oscillator:** $x(t) = \text{sgn}\left(\sin\left(\frac{2\pi t}{T}\right)\right) = \text{sgn}(\sin 2\pi ft)$
- Saw Oscillator:** $v(t) = \text{sgn}\left(\cos\left(\frac{2\pi t}{T}\right)\right) = \text{sgn}(\cos 2\pi ft)$
- Amplitude Envelope:** $2\left(\frac{t}{p} - \left[\frac{1}{2} + \frac{t}{p}\right]\right)$
- Filter:** $y(n) = x(n) + x(n-1)$
- Envelope:** $e(t) = \sqrt{x(t)^2 + \hat{x}(t)^2}$
- Amplitude:** $G(\omega) = 2\left|\cos\left(\frac{\omega T}{2}\right)\right|$

Other visible elements include a red box containing the equation $R = n(T/240)$ and various sliders for parameters like Amplitude, Width, LFO Amount, Envelope Amount, Frequency, and Resonance.

Learning synths. Learning Synths. (n.d.). <https://learningsynths.ableton.com/en/playground>