

THE STANDARD

Digital vs. Analog Signals

Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.



PS4.C · Information Technologies and Instrumentation

Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.

Signals carry information. Analog signals carry it as a smooth wave that can take any value, like a needle wiggling in a groove on a record. Digital signals carry it as a string of discrete pulses, usually just two values (on or off, 1 or 0). When a signal travels, noise gets added. Digital signals can be cleaned up by snapping each pulse back to its nearest value. Analog signals can't. **The noise stays.**



Obtaining, Evaluating, and Communicating Information

Integrate qualitative scientific and technical information in written text with that contained in media and visual displays to clarify claims and findings.

Students aren't building a phone. They're pulling information from a few different places (a short reading, a diagram, a video clip, a side-by-side audio sample) and stitching it into one clear argument. The claim is already given: digital is more reliable. **Their job is to back it up with evidence from multiple sources and explain it in their own words.**



Structure and Function

Structures can be designed to serve particular functions.

A signal's structure (continuous wave vs. discrete pulses) is what determines its function (degrades over distance vs. regenerates cleanly). Engineers picked digital for most modern communication because the structure was designed for the job. **The "shape" of the signal is the whole reason it works.**