

## 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.*

 ANCHORING PHENOMENON

## The Same Song, Two Ways

Play the same song twice in a row. First through a static-filled AM radio station, the kind you have to hold the antenna just right to hear. Then through a digital streaming service on a phone speaker. The song is identical. The signal carrying it is not. One is full of pops and fuzz. The other is crystal clear. Both traveled a similar distance to get to the room. Something in how each signal was built made all the difference.

## DRIVING QUESTION

*“Why does the same information sound completely different depending on which kind of signal carries it?”*

 INVESTIGATIVE 1

### Photocopy of a Photocopy

Show a clear printed photograph. Make a photocopy of it. Then a photocopy of that copy. Keep going for five generations. By copy five, the photo is muddy and unreadable. Then show the same image as a digital file, copied five times. Bit-for-bit identical to the original. Use this to sharpen the “analog noise builds up, digital noise gets cleaned out” lens the anchor is pushing on. Same kind of degradation, but in a way students can see, not just hear.

## DRIVING QUESTION

*“Why does information fall apart when you copy it as a picture, but stay perfect when you copy it as a file?”*

 INVESTIGATIVE 2

### The Whisper Chain

Line up six volunteers. Whisper a one-sentence message to the first. They whisper to the next, who whispers to the next, all the way down. The message at the end almost always comes out garbled. Then run it again, but each student passes a card labeled either “0” or “1” instead. Each card gets passed down the line, copied if needed, and read at the end. The pattern arrives intact. Same kind of “noise piling up” the anchor is showing, but built from students instead of speakers.

## DRIVING QUESTION

*“Why does a whispered message scramble down a line, but a pattern of 0s and 1s makes it through clean?”*