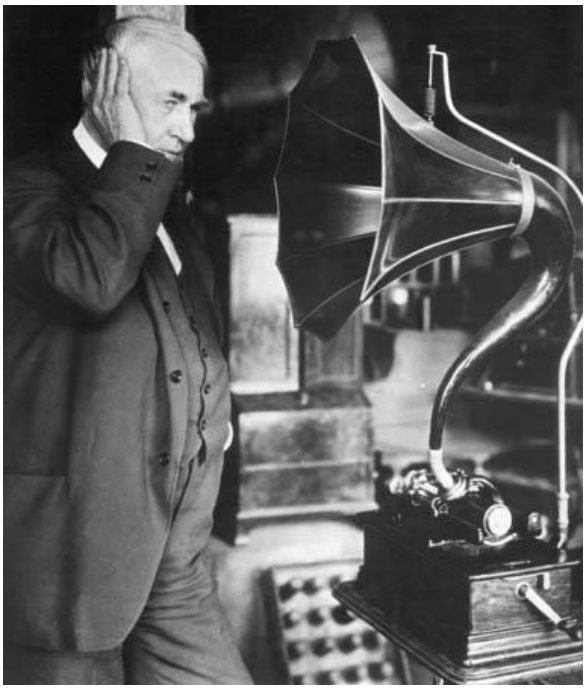
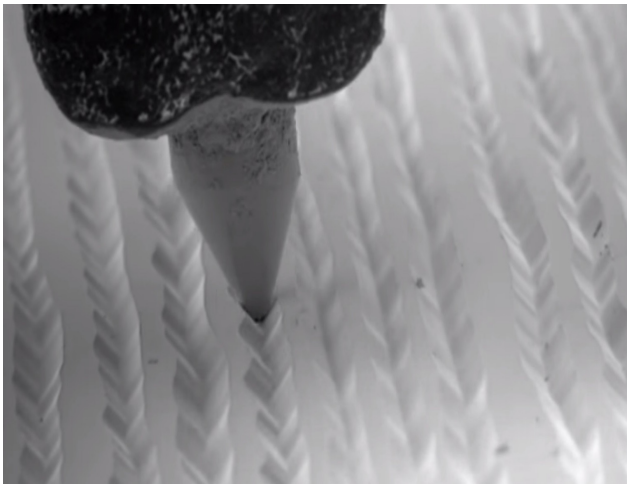
Handout 1 - How Records Work

Thomas Edison's phonograph, patented in 1877, launched the recording industry by facilitating, for the first time in human history, the capture and replay of sound. To record, the phonograph funneled sound through a large horn with a needle at its narrow end. The vibrations of this sound moved the needle which then cut grooves into the recording medium and in so doing captured those sound waves. To play the sound back this process was reversed, this time using a "needle" designed to follow the indentations rather than cut new ones. The needle revealed the sound that had been recorded. The image below shows a magnification of a phonograph needle in the groove of a record.



Thomas Edison and his phonograph
Credit: Library of Congress



A phonograph needle in the groove of a record
Credit: Ben Krasnow, Applied Science

Early phonographs used no electricity for recording or playback. When electricity was introduced to the process in the 1920s, the recording horn and many of its inherent sonic limitations were replaced by the microphone. The flat disc--what we call a "record" today--also replaced the cylinder during this period. At the time, however, most records were made of a compound of shellac. By the 1950s that changed, and nearly all records were made of vinyl.

Throughout the first half of the 20th century manufacturers experimented with the diameter of records as well as the speed at which they spun. However, in the late 1940s a few key developments came. First, in 1948, Columbia Records introduced the “Long Player,” a 12-inch record that rotated at 33 ⅓ rpm. The larger size of the disc, and the slower speed at which it played allowed it to hold roughly 18 minutes per side. The following year RCA Victor released a new 45rpm 7-inch record. Though its smaller size and faster rotation permitted only 4-7 minutes per side, it also allowed for deeper, more widely spaced grooves which made the record play louder. RCA also promoted a new, small portable playback system (pictured here) that automatically switched between records that the user stacked on its spool. This allowed, for the first time, listeners to cue selections and imitate the DJs they heard on the radio.

RCA Victor portable briefcase-style 45 player

Though what became known as the “single” and the “LP” were initially marketed as direct competitors, the various possibilities of the mediums led to different uses, and the two formats became the standard for the remainder of the vinyl era.