In the 1880s, pioneer J. Welch claimed the land surrounding small Round Lake in northwest King County and thereafter the lake was known as Welch Lake. In the early 1900s, Theodore Haller acquired and subdivided the property, selling lots to new settlers. Streets were laid out, and a community grew around what then became Haller Lake. Children of the area had to travel to Broadview or Oak Lake schools, both located over two miles away.

By 1923, the number of school-age residents around Haller Lake was large enough to warrant their own school. Property for a school had been set aside some 30 years earlier and had been leased in order to raise funds for school construction.

When the school opened in 1924, only two of its four classrooms were used, one for grades 1-3 and the other for grades 4-6. The completion of First Avenue NE from 125th provided access to the school grounds. When its name became official in 1925, Haller Lake School was the third school in Oak Lake School District 51. The school's boundaries extended from N 110th Street to the north county line, and on the west from Aurora Avenue to the east at 15th Avenue NE.

There was no lunchroom at the school at first, so pupils ate lunches from home in their classrooms. The first hot lunches were brought in by a neighbor, Mrs. Benson, who prepared them in her kitchen. One of the first projects of the PTA, organized in 1933, was to purchase a steam table, so that hot lunches could be served in the basement of the school. By this time, all four classrooms were occupied.
Haller Lake acquired its first addition in 1934 when four classrooms and an auditorium/lunchroom were constructed on the north side of the building. A major landscaping project was launched in 1939, adding a playground, lawn, and shrubbery with the help of the PTA and students. They planted eight birch trees along 1st Avenue NE and, at the base of each tree, they buried a bottle containing a record of an important event of that year.

Oak Lake School District became part of Shoreline School District in 1943. Increasing enrollment resulted in a second addition in 1950, that added eight more classrooms and another gymnasium/auditorium (the previous combination room became a cafeteria). Even with this extra space, portables were added in 1951, with a total of six in use before 1964. Haller Lake’s enrollment peaked in 1957–58, when 750 students attended the school.

Haller Lake School became part of the Seattle School District in 1954. The school was closed at the end of the 1978–79 school year as part of a district-wide policy of consolidation during periods of declining enrollment.

In 1979–80, the building was leased to the North Seattle Church of the Nazarene. In October 1980, the surplus school was put up for sale. Two institutions, the North Seattle Church of the Nazarene and Lakeside School, bid on the property. In December 1980, the private school purchased it for use as Lakeside Middle School to augment its main campus a few blocks to the north, paying $1 million over the appraised value.

In 1999 the old building was torn down to make way for Lakeside’s new middle school building. At that time, photographs, articles, and personal recollections about Haller Lake School were gathered in a scrapbook now housed in the new Lakeside Middle School library.