Located in the Jefferson Park area of Beacon Hill, Asa Mercer Junior High School was named for Asa Shinn Mercer who, at age 22, became president and sole teacher of the newly founded Territorial University. In 1861, he aided development of the young city of Seattle when he convinced 11 young women to come west as prospective brides. In 1865, he again went east and convinced nearly 100 more young women to come to Seattle. He was the younger brother of Thomas Mercer for whom Mercer School on lower Queen Anne was named.

The land for the new junior high was the property of the city until 1949 when it was deeded to the Veterans Administration for a hospital as part of a larger building tract. In 1954, a portion of that tract was returned to the city for the construction of a school. To complete the development of a playfield and provide for a future fieldhouse, the Seattle Parks Department deeded additional acreage to the Seattle School District. To accommodate the plans for the new school grounds, a few fairways of the Jefferson Park Golf Course were relocated.

The school was built with an 800-seat auditorium. When Mercer opened in fall 1957, its 1,093 students came from several south end
schools. The 8th and 9th graders had previously attended Cleveland and Sharples, while the 7th graders came from Beacon Hill, Columbia, Concord, Georgetown, Maple, Muir, and Van Asselt.

Despite careful planning based on population surveys and other data, the building soon proved to be too small to house the growing secondary school population in the area. The following September two portables were placed on the grounds. Additionally, from 1958 to 1962, about 250 9th graders were housed at Cleveland High School. An additional 16 portables were added as enrollment topped 1,500 in 1963–64.

To meet the needs of its students, a number of programs have been pioneered at Mercer. In 1981–82, a computer-assisted learning program called Prescriptive Learning was piloted at Mercer, resulting in significant improvement in skills for students previously reading below grade level. With 44 percent of the student body Asian American, Chinese and Japanese classes are part of the foreign-language offerings.

The Belief Academy also started at Mercer in 1991. An experimental program for learning-disabled and behaviorally-disordered students, it is funded by the federal government and is a cooperative effort of the district and the University of Washington.

The school also features the teaching of occupations as a survey course in career planning. A partnership with its neighbor, the Veterans Hospital, allows 8th graders to perform volunteer work. At least 19 students have later been hired there. Additionally, environmental education is part of the regular science curriculum.

The school is collaborating on a Ports Project with the Port of Seattle, University of Washington, and World Affairs Council. Mercer has excelled at the middle school Math Olympiad for the past three years.