This study examined middle and secondary mathematics teachers’ knowledge structures, informal inferential reasoning (IIR), and pedagogical content knowledge (PCK) for statistics. Using task-based clinical interviews (Goldin, 1997) and cross-case analysis (Creswell, 2013), a stratified purposeful sample (Patton, 2002) of nine teachers responded to the Goals and Outcomes Associated with Learning Statistics (GOALS-2) instrument (Sabbag & Zieffler, 2015), released items from the Levels of Conceptual Understanding in Statistics (LOCUS) assessment (Jacobbe, 2016) and supplemental questions to assess PCK (Watson et al., 2008). Responses were used to construct maps of teachers’ knowledge structures for measures of center, spread, and shape (Groth & Bergner, 2013) and knowledge structures were analyzed for common characteristics. Teachers’ IIR was coded for the appropriateness of responses (Means & Voss, 1996) and key components of IIR (Makar & Rubin, 2009) were identified. To distinguish teachers’ PCK level, descriptions of four hierarchical levels were used (Callingham & Watson, 2011) and knowledge structures were classified as desirable-connected, undesirable-connected, and undesirable-disconnected. Although teachers largely engaged in the inference and data components of IIR, they rarely referenced the uncertainty component. In general, teachers with more connected knowledge structures and fewer undesirable knowledge elements exhibited more acceptable forms of IIR and higher PCK levels. Within IIR contexts, teachers struggled to exhibit acceptable forms of IIR and demonstrated the lowest levels of PCK, but within non-IIR contexts, they exhibited acceptable reasoning more often as well as higher PCK levels. Implications for teacher education are discussed and recommendations for future research are offered.