Given a totally real cubic number field K we construct \mathcal{F}_K a weight 1 modular form with level and nebetypus that depend only on the discriminant of K. We show that for fields K of fundamental discriminant the assignation $K \to \mathcal{F}_K$ is injective. Furthermore, if d is a positive fundamental discriminant, and \mathcal{C}_d denotes the set of isomorphism classes of cubic number fields of discriminant d, we show that $\{\mathcal{F}_K : K \in \mathcal{C}_d\}$ is a linearly independent subset of $\mathcal{M}_1(\Gamma_0(\mathbf{N}_d), \epsilon_d)$.