

Before generating your BR, gather background information on hummingbirds (their movements, feeding patterns, and ecology) and how hummingbirds relate to flowers more generally



**Testable Question**

Do hummingbirds visit *Lobelia cardinalis* (Cardinal flower) or *Monarda didyma* (red bee balm) more frequently when both are equally present?

**Independent variable**

Cardinal flower and red beebalm presence and abundance

**Dependent variable**

Number of hummingbird visits

Cardinal flower and red beebalm overlap in flowering time and vary in sucrose concentration with cardinal flower averaging 5% and red beebalm 20% sucrose as measured in the Konza Prairie (Jabar, 2004)

High metabolic rate and low energy reserves in hummingbirds requires frequent feeding (Johnson et al, 1975)

**Literature connecting variables**

Ruby-throated hummingbirds visit cardinal flowers and red beebalm in the Konza Prairie (Sally and Bruff, 2003)

**Observation**

Cardinal flower and red beebalm grow in similar abundance and flower at the same time in the Biocore Prairie.

32 ruby-throated hummingbirds were reported in a 2014-2016 bird census of the Biocore Prairie

Few other red-colored, nectar producing species are abundant near the Biocore Prairie

**Assumption**

High metabolic rate and low energy reserves in hummingbirds requires frequent feeding (Johnson et al, 1975)

**Knowledge gap**

**Hypothesis**

We hypothesize a greater number of hummingbird visits to red beebalm than cardinal flower in the Biocore Prairie over a 3 day period.