Say we have an apple, orange, and blueberry. They each have a set of features, like color and size. So we graph size relative to color, two dimensions of features, thus the feature space is two dimensional. The feature space is usually given.

We want to create clusters where the distance between elements in the same cluster is small but the distance between clusters is big. So we have an optimization problem.

Classification problems are what we have been doing, supervised learning. Clustering is when the data is unlabeled, unsupervised.

Topology

- The Kohonen's Self-Organizing Network (KSON) belongs to the class of **unsupervised learning networks**.
- This means that the network, unlike other forms of supervised learning based networks updates its weighting parameters without the need for a performance feedback from a **teacher** or a **network trainer**.