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| Seeds vary greatly in size and shape. Some seeds, such as the tobacco plant, are very small. On the other hand, some seeds, such as the coconut tree, may weigh more than twenty pounds. Seeds consist of three main parts called the seed coat, the embryo and the food storage tissue. The seed coat, also known as the outer skin, protects the embryo from injury, insects, and loss of water. The embryo contains all the parts, such as an immature root and stem, needed to form a mature plant. It also has one or more cotyledons, which are embryo leaves. A monocotyledon seed, such as a corn seed, has one cotyledon. A dicotyledon, such as a pea or bean seed, has two cotyledons. These cotyledons absorb food from the food storage tissue, which is also known as the endosperm in flowering plants. However, in some plants, such as peas, the embryo absorbs the endosperm and food is stored in the cotyledons. Once the seed becomes active, it goes through a process called germination (Byrne).  All seeds need moisture, oxygen and warmth to germinate. Seeds receive the moisture they need from the ground. The moisture softens the seed coat, which lets the growing parts to break through. If the seed receives too much water, it may rot. However, if the seed receives too little water, germination may take place slowly, or not even at all (Keating). The seed absorbs water, which makes it swell. The water triggers chemical changes that allow the embryo to change the stored food into energy needed for growth. The swelling splits the seed coat so that a tiny seedling shows. The lower part of the seedling is called the hypocotyls, which develops into the primary root. This root anchors the seedling into the ground, which later develops a root system that supplies water and minerals to the plants. In peas, the upper part of the seedling, also known as the epicotyl, carries the cotyledons above ground. After the seedling develops its own roots and leaves, it can develop its own food. Cotyledons are no longer needed for nourishment (Keating).  Seeds may go through a period of dormancy, which is inactivity. Dormancy prevents seeds from sprouting when conditions are not favorable for growth. For instance, some dormant seeds must have its outer layer broken before they can germinate. Other dormant seeds need a period of cold weather or additional sunlight. For example, dormancy prevents seeds from germinating in the fall, which protects the seed from being killed in the winter (Keating). If the seed is not killed, it grows into a living plant.    ([Intro1](http://docs.google.com/introduction.html))([Intro2](http://docs.google.com/intro2.html))([Intro3](http://docs.google.com/intro3.html))([Intro4](http://docs.google.com/intro4.html))  [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2002 Projects](http://docs.google.com/AP2002/index.html)][[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |