ROOT AND SHOOT APICAL MERISTEMS The vascular plant body is polar, meaning that it has a shoot end and a root end.The procambium cells differentiate into the cells of the primary xylem and primary phloem.This increase in girth requires lateral growth, which involves the formation and activity of the next category of meristems, called secondary meristems.The ground meristem differentiates into the cells of the pith and cortex of stems and roots and the mesophyll of leaves.Whether it's because of a scarcity of nutrients, or structural limitations, or heredity, eventually a plant ceases to grow.Also, each plant and plant organ (leaves, stems, and roots) has a system for genetic regulation of growth; every species seems to have an optimum size.PRIMARY MERISTEMS If you made a very thin longitudinal section through them (SAM and RAM) you would see that the cells of the SAM and RAM and those just basal to them (toward the more mature cells) are ordered into distinct files of cells.These newly ordered cells are still meristematic (they can divide); they are in a sense the embryonic stages of the tissues.These groups of cells are called the primary meristems, and they have two roles: to form the primary tissues and to elongate the root and shoot.There are three primary meristems: protoderm, procambium, and ground meristem.Theoretically, apical meristems could operate forever.