**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**3.2
Learning Target:**

**Evidence indicates that life first appeared on Earth about 3.8 billion years ago. Tiny single-celled and multicellular organisms lived in watery environments such as warm shallow seas. Fossil evidence suggests that plant life did not appear on land until about \_\_\_\_\_\_\_\_ million years ago.**

**How do scientists think plants moved from the water to the land?**

**What did the first plants on land need to be able to do?**

**1.**

**2.**

**What were the benefits for the first plants on land?**

**1.**

**2.**

MOSSES and FERNS

Among the first plants to live on Earth were the ancestors of the
\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ you see today. Both probably evolved from species of \_\_\_\_\_\_\_\_\_\_\_\_\_ that lived in the sea and in fresh water. Mosses are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in structure than ferns. Mosses, and two closely related groups of plants known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are descended from the first plants to spread onto the bare rock and soil of Earth. Ferns and their relatives appear later.

Mosses are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plants. Nonvascular plants do not have \_\_\_\_\_\_\_\_\_ tissue. Water and nutrients simply move through the bodies \_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_. Moss plants have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for life on land. For example, each moss cell, like all plant cells, is surrounded by a thick \_\_\_\_\_\_\_ that provides it with support. Moss cells also have special storage areas for \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Mosses do not grow very \_\_\_\_\_\_\_\_\_\_\_ but they do have simple \_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_. And \_\_\_\_\_\_\_\_\_\_\_\_. These adaptations help moss plants survive on land while \_\_\_\_\_\_\_\_\_\_ survived only in water.

Mosses Reproduce with Spores

Mosses, Ferns and Fungi all reproduce with \_\_\_\_\_\_\_\_\_\_. Spores are an important adaptation that allowed the \_\_\_\_\_\_\_\_\_\_\_\_ of these organisms to reproduce on land. A spore is a single reproductive \_\_\_\_\_\_\_\_\_\_\_ that is protected by a hard, watertight covering. The covering prevents the cell from \_\_\_\_\_\_\_\_\_\_ out. Spores are small and can be transported through the \_\_\_\_\_\_\_\_. This means offspring from spores can grow in places that are distant from the parent organism.

Within a clump of moss are both male and female reproductive structures (first generation). When conditions are right, these structures produce \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_. Fertilization can occur only if \_\_\_\_\_\_\_\_\_\_\_\_\_ is present because the tiny moss sperm move by swimming.

Open to page C95 of your textbook to complete the last part.

 The fertilized egg grows into a \_\_\_\_\_\_\_\_\_\_\_\_ with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the end – the second generation of the plant. The stalk and capsule grow from the female moss plant. Inside the capsule, the process of meiosis produces thousands of tiny spores. When the spores are released as shown in the figure on page c95 the cycle can begin again. Draw a picture below of moss releasing spores. Include the capsule, stalk, spores, moss plant, first generation and second generation.

Ferns

Ferns are vascular plants.

The tube-like tissues of the vascular system moves water through a plant’s body more \_\_\_\_\_\_\_\_\_\_\_\_\_ than when water moves cell by cell. Because of this, vascular plants can grow much \_\_\_\_\_\_\_\_\_\_\_\_ than nonvascular plants. Vascular tissue also provides support for the weight of a larger plant.

Draw a picture of the fern leaf.

The leaves of a fern are called \_\_\_\_\_\_\_\_\_\_\_\_. On the backside of a fern frond there are many small clusters. The clusters are full of \_\_\_\_\_\_\_\_\_\_\_\_\_. Label the frond and spore clusters on your drawing above.