**Fossils Extension:**

Choose ANY one of the following: For every extension you complete you will receive 3 extra gotchas!

1. Research the 13 events in the table on page one, and put them in chronological order (which came 1st, 2nd, 3rd…).
2. Read the Fossils Reading on page 2 then summarieze the paper in 2 complete paragraphs.
3. Research Lucy, the oldest human fossil ever found, and write a couple of paragraph about what you found out.
4. Research “the oldest fossil ever found” and write a couple of paragraph about what you found out.
5. Research “the largest fossil ever found” and write a couple of paragraphs about what you found out.

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| **List of 13 Events** | **Order in which they first happend** |
| Solar System Forms |  |
| Oldest Life form |  |
| Mountain building |  |
| First Fish |  |
| First land Plant |  |
| Amphibians |  |
| First reptiles |  |
| Atlantic Ocean formed |  |
| First dinosaur |  |
| Last dinosaur |  |
| First humans |  |
| Grand Canyon begins to form |  |
| Space age program begins |  |
| You were born |  |

**Background**:

Fossils are the preserved remains or impressions of organisms from Earth’s geological past. They can reveal details about the events that have occurred on Earth since its formation.

**Fossil Types**

There are several types of fossils. **Remains** (often called *body fossils*) are the parts of organisms that remain intact after the soft organic materials have decomposed. Such remains or body fossils include teeth, shells, skulls and skeletons, and the cellulose structure of plants. **Trace fossils** include tracks, trails, burrows, borings, nests, or any other indication of the activities of an organism. Fossilized feces, called **coprolites,** provide evidence of activity of organisms and may offer important information about the diet of size of the animal that produce them.

The fossils of organisms can also be preserved as **unaltered remains**, in which case the fossil retains the organism’s original structure and composition. For example, partial or complete insects and small arthropods can become embedded in tree resin, which fossilizes when the resin is dried and hardens into a clear shell called amber.

Organisms also can be fossilized in tar, by **mummification,** or by freezing. In the La Brea Tar Pits, in what is now west Los Angeles, tar that bubbled up to the surface formed pools in which many animals became trapped.

Mummification involves air-drying and the shriveling of soft body parts such as muscles and tendons before the organism becomes buried. In rare cases, freezing also can preserve an entire organism. Wooly mammoths, woolly rhinoceroses, and musk oxen are animals that were once frozen and have been recovered. In exceptional cases, preservation by freezing and mummification provides scientist with partial or nearly complete body fossils with flesh, hair and internal organs.

**Altered remains** are fossils that have been changed structurally or chemically, or both. Mineral matter may seep into the pores and cavities of an organism’s bones, teeth, and shells. These minerals replace the organism cell by cell after it becomes buried in sediment. This process increases the durability of the potential fossil. Plants and insects can be fossilized this way when the organic elements of the organism decay, leaving behind a thin carbon film replica. The woody tissue of tree trunks and leaves can be replaced by rock-forming chemicals to form petrified remains. The Petrified Forest in Arizona, for example has huge pieces of petrified wood from ancient trees that once grew there.

Fossils also may be preserved as molds and casts. In a **mold**, the impressions of soft-bodied animals are left after the animals are covered by sediment. Acids may dissolve a shell, bone, or tooth and leave an impression or mold in the sediment that eventually forms the rock in which the mold is found. For example, the Burgess Shale fossils are fossilized impressions of fragile, soft-bodied creatures---including jelly-fish---that were covered with fine sediments. Another type of fossils mechanism is called a **cast.** If sand or other minerals fill the cavity-shaped mold and then harden over time, a replica of the original organism forms. In some cases, butterflies have been covered with ash from a volcanic eruption, leaving an exact image of that insect.

**Fossil Record**:

Fossils are quite common, but the fossil record is biased toward organisms with preservable skeletons and those organisms that lived in areas of active sedimentation or volcanic ash fall, since they can be buried. Despite their abundance, fossils represent a small number of the organisms that lived at any one time, because any potential fossil must escape the destructive processes of chemical and physical weathering, erosion, scavengers, and bacteria. Most fossils preserve only a small portion of the organisms body parts (such as shells, bones or teeth) that can withstand the chemical and sedimentary process of burial. Most fossils are found under bodies of water (or where water once found), covered by sediments and safe from the wind, rain, and other erosive or corrosive agents.