1. In Canada’s ______________ Mountains we can find evidence for an explosion of life forms. It happened during a period called the ______________ which began ______________ million years ago. They can be seen high up in these mountains in the Burgess ___________________. These rocks formed on the floor of a ______________ sea teaming with life. These fossils were discovered in 1909 by an American paleontologist named Charles Walcott. Since that first discovery over ______________ different specimens of extinct Cambrian animals have been found. Even soft bodied animals were well preserved in these shales.

2. **Opabinia** was one of the strange creatures with __________ eyes is a strange looking one indeed. Wielding a long flexible proboscis tipped with grasping spines, its reconstructed image was greeted with laughter as a pretty good joke when first presented at a scientific meeting in 1972. The strange-looking reconstruction was soon confirmed, and this creature remains one of the oddities of the Burgess Shale fauna. **Opabinia** is thought to have lived in the soft sediment on the seabed, although it presumably could have swum after prey using its side lobes. On the bottom, the proboscis could have plunged into sand burrows after worms. Sizes ranged up to three inches, plus that unique, amazing one inch proboscis!

**Hallucigenia** was another oddity. Based on the appearance of those initial fossil preparations, the first restoration made in 1977 presented us with an animal walking along the bottom of the seafloor on spiny stilts, waving seven dorsal tentacles from its back. The "tentacles" seemed to have a mouth at each tip. These were believed to be feeding aids. You can easily see why **Hallucigenia** got its curious name. Recent findings of exceptionally well preserved specimens of an animal closely related to **Hallucigenia** from the Early Cambrian Chengjiang Fauna of China show us there is a second set of "tentacles" paired with the first, each tipped with a set of claws. This made much more sense. The first fossils were mistakenly reconstructed ______________. The spines were not used for walking, they were born on the back of animal and may have been used to protect it from predators. The paired, clawed "tentacles" were the real walking legs!

**Anomalocaris** was a fearsome-looking beast is the largest known Burgess Shale animal. Some related specimens found in China reach a length of six feet! The giant limbs in front, which resemble shrimp tails, were used to capture and hold its prey. A formidable mouth on the undersurface of the head had a squared ring of sharp teeth that could close in like nippers to crack the exoskeleton of arthropods or other prey. With those large eyes and a body half flanked with a series of swimming lobes, this must have been an active, formidable ______________. **Anomalocaris** is one of the most widely distributed of the Burgess Shale animals. In addition to Canada and China, specimens have been unearthed in Cambrian deposits in Greenland and Utah. After death this large organism tended to disintegrate and fall apart into separate chunks, and completely intact fossil remains are very rare. Since these chunks resembled other kinds of simple animals (such as those shrimp-like front limbs), for a long time the separated pieces were interpreted to be individual animals. No one was able to recognize **Anomalocaris** for what it was until complete specimens began to be found! If you look at photos of actual fossil pieces, the jaws and the forelimbs, you’ll see how easy it to be mistaken. Living Mantis ______________ may be very similar to **Anomalocaris**.
3. It may be that the Cambrian explosion was a response to the first predators. One response to predators was a chitinous ________________. These were the Arthropods. One group of very successful arthropods was the trilobites. Many people living in the mountains of ________________ mine and extract wonderfully delicate and varied trilobites. Many of these trilobites are ________________ perhaps because they were entombed by undersea landslides (turbidites). Trilobites had complex eyes made of the mineral ________________. They may have even had stereoscopic (3D) vision. Trilobites get to ________________ in size.

4. The largest marine arthropods of all time were the Eurypterids or sea ________________. They got up to ________________ feet in length, and were found in the seas from Ordovician to Permian.

5. No animals were present on Cambrian lands. The Burgess Shale seas contain an animal with an unusual assembly of spines and grasping arms at the head end. Its mouth lies in the center of that ring of six finger-like projections. Aysheaia is thought to have been a parasite living on sponges since it is commonly found in association with their remains (spicules). It looks almost identical to a creature found in the rain forest of Australia today known as a velvet ________________.

6. The first air breathing, land living arthropods known was discovered in Scotland in 2004. It is a one-centimeter millipede, and was dated at ____________ million years old which puts it in the Silurian Period. The millipede had spiracles, or primitive breathing structures on the outside of its body, making it the oldest air-breathing creature to have been discovered.

7. During the Carboniferous Period the levels of ________________ in the air was much higher than today allowing the largest land dwelling arthropods of all time. Some millipedes were as long a as ________________. During this period there were flying arthropods (dragonflies) with wingspans of nearly ________________ feet.

8. The Burgess Shale also contains the first chordate, the phylum to which the vertebrates (including humans) belong. It is called Pikaia. Averaging about one and one half inches in length, Pikaia swam above the seafloor using its body and an expanded tail fin. Instead of an external skeleton like the arthropods, it had an internal one, with a thin bristly rod which was the beginnings of a ________________. 