Name: _____ Date: _____

Web Exploration: Insect Metamorphosis

Learning goals
After completing this activity, you will be able to …

- Describe insect metamorphosis.
- Understand the life cycle of insects.
- Explain the differences between complete and incomplete metamorphosis in insects.

Vocabulary: chrysalis, cocoon, complete metamorphosis, exoskeleton, incomplete metamorphosis, larva, metamorphosis, molting, nymph, pupa

What is metamorphosis?
The animals in the images shown below do not look very similar:

The image on the left is a caterpillar. The image on the right is a butterfly. Though they look very different, caterpillars can turn into butterflies. When an animal changes its form in this way, it is called **metamorphosis**. Almost all insects undergo metamorphosis during their natural lifecycle.

1. Look up "metamorphosis" in the dictionary. To determine where the word comes from, find out the meanings of the two main parts of the word:

   A. What does "meta" mean? _____

   B. What does "morph" mean? _____

2. What are metamorphic rocks? _____

   _____

Complete metamorphosis
Caterpillars are very different from butterflies. Changing from a **larva** (caterpillar) to the adult form (butterfly) takes a long time. The intermediate stage in an insect's life is called the **pupa** stage. It often lasts a week or two, but some species stay in this stage for years.

The pupa stage is not the same for all insects. Some insects spin silk shells called **cocoons**, other insects just rely on an old layer of shell to protect them. Because pupa stages differ from one species to another, they are called by different names. A butterfly's pupa stage is called a **chrysalis**.

When an insect completely changes its form, going from larvae to pupa to adult, it is called **complete metamorphosis**.

Incomplete metamorphosis
Not all insects go through complete metamorphosis. The form they have as a larva, called a **nymph**, looks like a smaller, less developed version of their adult form. For example, nymphs often lack wings or reproductive organs.

Insects are covered by a hard **exoskeleton**, which makes it hard for them to get bigger. This is one reason they occasionally shed their skin, a process called **molting**. Every time a nymph molts, it has a few hours to grow before its new skin hardens. It can also develop new body parts during a molt. Eventually, it develops into a fully mature adult and stops molting.

This process of slow transformation through molting is called **incomplete metamorphosis**.

For each insect listed below, use the Internet to look up information on its lifecycle. Determine whether it goes through complete metamorphosis or incomplete metamorphosis. Underline the word "complete" or "incomplete" in your answer. For those that go through complete metamorphosis, describe the pupa stage. Describe in your own words how each insect develops from larva to adult. The first one is done for you.

Butterfly: *A butterfly goes through complete metamorphosis. Its pupa stage is called a chrysalis. To form a chrysalis, a caterpillar spins a small pad of silk and uses it to attach itself to a branch. It then sheds its skin, which becomes an exterior, protective layer for the pupa.*

Beetle:

Ant:

Cockroach:

Grasshopper:

Moth:

Termite:

Dragonfly:

Housefly: