

CREATE-AN-INSECT 2021

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CONSTRUCTION TECHNIQUES & ENGINEERING TIPS



Q: How can we get strength from paper & card?

By folding or rolling, you create 'thickness' which allows the paper or card to reinforce itself and not collapse so easily. Pleating (concertina folding) is an excellent way to get strength. Also think about shapes that are used to build strong structures - such as triangles.

Q: We have no glue or tape. How do we stop paper & card from un-rolling or un-folding? How do we attach 'wings' or 'legs' to our insect?

By using cutting and slotting or by using tabs which can be cut and folded inwards or outwards, or by inventing your own technique. To 'cut and slot', with two separate pieces of card/paper, cut a slit into the middle of both pieces then join the two shapes by sliding both pieces together at the cuts. To stop lengths of paper/card from unrolling you can also use a strip of card/paper like a 'belt', securing 'the belt' using the 'cut and slot' technique.

Q: What are the important considerations in creating an insect?

You will need a strong body - this has to support the legs and wings if using them, make this your first priority. The body also needs to be steady - so you need to be careful with any cutting. Research real insects, how many legs do they have, look at the bodies and see how you can create your own. Some insects have camouflage to protect them from their prey. Think about where they live!

When adding the legs and wings it's important to think about balance - develop the legs in more than one direction otherwise the insect will not stand up. For the most 'life-like' insects, the overall body shape is very (have a look at insect profiles on the internet).

Remember you only have 4 pieces of paper to do your challenge. Practice with folding and cutting techniques before attempting your own CREATE-AN-INSECT!

Facts about Insects

Introduction

The insects are the largest group of animals. In fact, about 75 percent of all animals are insects. Insects developed on Earth long before humans did. Today there are about 1 million known species, or types, of insect. And scientists are constantly discovering new species. Butterflies, beetles, ants, flies, grasshoppers, silverfish, and bees are all insects.

Where Insects Live

Insects live all over the world. They can survive in almost any place where food is available. For instance, insects can be found in cold regions, hot rain forests, deserts, mountains, caves, and freshwater. A few kinds even live in salt water.

Physical Features

Insects are members of a larger group called the arthropods. This group also includes spiders, ticks, centipedes, lobsters, and crabs. Like all arthropods, insects have a body that is divided into segments, or sections. They also lack a skeleton inside the body. Instead, insects and other arthropods have a covering on the outside of the body called an exoskeleton. This exoskeleton protects the body.

Unlike other arthropods, insects have three major body segments. Insects also have six legs. This is one way that insects differ from spiders, which have eight legs. Insects also have at least one pair of antennae, or feelers.

The three major segments of an insect body are the head, the thorax, and the abdomen. The head contains the insect's antennae, mouthparts, and eyes. The adults of many species have two kinds of eyes, simple and compound. Compound eyes have many lens like parts. Each of these receives a separate image. The images are combined into a single picture in the insect's brain.

The thorax has three pairs of legs and usually two pairs of wings. But some insects have only one pair of wings or no wings at all.

The abdomen is made up of as many as 11 segments. It contains organs that digest food, push out wastes, and help the insect reproduce.

Insects vary greatly in size. Most insects are small, usually less than 0.2 inch (6 millimetres) long. However, some insects called walking sticks can grow to more than 12 inches (30 centimetres) long.

Behaviour

Insects have a variety of ways to protect themselves from their enemies. For example, some insects hide by blending in to their surroundings. Many moths have a similar colouring to the bark of the trees on which they rest. Beetles have a very hard body armour to protect them. Some insects bite or sting their enemies. Some kinds produce poison.

Some kinds of insects live alone, while others live in groups. Termites, ants, and some bees and wasps live in very organized groups. Each individual has a particular job to do for the

group. For example, some termites are born to be soldiers or workers. Other termites will be the king and queen.

Insects eat a great variety of plants, animals, and other living things. Certain insects, such as fleas and lice, live on the body of another animal. They get all their food from that animal's body. Such insects are called parasites.

Life Cycle

Most insects hatch from eggs. A few kinds are born live. An insect's exoskeleton cannot grow. Instead, as the insect grows, this covering splits apart and falls off from time to time. The insect grows a new covering. This process is called moulting.

There are two basic life cycles found in insects. Some insects are born in nearly the same form they will have as an adult. The insect grows and moults, eventually becoming an adult. Grasshoppers and cockroaches go through this kind of growth process.

Other types undergo a complete change, or metamorphosis. After they hatch, they begin life in a form called a larva. It is completely unlike the adult form. For instance, a larva may look more like a worm than an insect. The larva eats a great deal and moults several times. It then enters a resting stage in a form called a pupa. The pupa's body changes greatly during this stage. It develops all of the features of the adult, including wings and legs. When this stage is complete, the adult emerges from the pupa. Bees, butterflies, and moths are some insects that develop this way.

Helpful and Harmful Insects

Many insects are helpful to humans and other animals. Some kinds eat other insects that are pests. Insects are also food for other animals. Some insects produce valuable products such as honey, silk, and dyes.

Many flowering plants depend on insects such as bees to help them reproduce. As insects feed on flowers, they spread a substance called pollen from the male parts of flowers to the female parts. This allows the female parts to make seeds.

Insects can also be pests. Some insects sting or bite people or other animals. Many insects can spread diseases to people, other animals, and plants. And some harmful insects eat crops, wood, clothing, and carpet.

For more guidance, refer to the pdf file 'STEMPOINT East Create an Insect diagram 2021'



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