Insect Lore

Growing Butterflies Since 1969

Butterfly Garden School Kit Instruction Guide

Butterfly Garden School Kit includes:

- A reusable Butterfly Pavilion hatching habitat with super clear mesh for easy viewing and dual zippered entry for easy access.
- A Caterpillar Voucher to redeem for 33 caterpillars, vials, lids, attachment squares, food, brush, and spoon. (The voucher is not included in kits sent with live caterpillars.)
- Chrysalis Station for any extra caterpillars.
- This informative instruction guide, bursting with caterpillar/butterfly facts.

Caterpillars to Butterflies – Right Before Your Very Eyes!

At Insect Lore, we have always believed that adding just a bit of nature to our lives enhances feelings of contentment and belonging.

Placing a sense of wonder and excitement into a child's life and holding that intense interest for a period of weeks is not an insignificant thing. We believe that the development and use of our Butterfly Garden provides just that.

In our nearly 50 years of existence, we have never failed to see the importance Nature plays in the lives of young and old alike.

Your little caterpillars will grow to ten times their original size, change into jewel-like chrysalides, and finally, emerge as gorgeous Painted Lady Butterflies!

1. Insect Lore Butterfly Activities and Crafts Online

Visit us at InsectLore.co.uk to find helpful instructional videos, instructions and answers to common questions.

See our Pinterest Boards at pinterest.com/insectlore to find butterfly games, lessons, crafts, FAQs, and more!

2. Plan Your Butterfly Metamorphosis Time-Line

If you have a kit with a Caterpillar Voucher, be sure you are ready to take care of them before redeeming it. You'll need to watch over your caterpillars, care for them responsibly, and observe their exciting changes on a daily basis! That's why planning is important.

- Plan for any school breaks, holidays or extended weekends that might interrupt your project.
- Keep in mind you will release your butterflies within three to five weeks after you receive your caterpillars. Your caterpillars will develop more quickly in warmer environments.

3. Visit InsectLore.co.uk to Redeem Your Voucher

When you are ready to order your caterpillars, it is best to redeem your voucher online. See your Caterpillar Voucher for details.

- Order your caterpillars when it is warm enough in your area. As we send to all EU countries, we are unable to determine the weather conditions in your area. Caterpillars are available in the EU from March to Mid-September. This ensures an available food source for the butterflies to thrive when released. Temperature should be at least 12° C when releasing your butterflies.
- Keep your Voucher Code in a safe place so you can refer to it if you contact Insect Lore about your shipment.
- Once your order is received, it takes about one to two business days to process, and then about three to seven business days in transit.
- We guarantee three out of five caterpillars to become perfect Painted Lady butterflies. Retain your Caterpillar Guarantee (sent with each set of caterpillars). If your order does not fulfil this guarantee, please contact Insect Lore within 30 days of receipt of your caterpillars.

4. Your Caterpillars Have Arrived!

Your caterpillars will arrive in a cardboard box with the label "OPEN IMMEDIATELY". This box will contain 33 larvae, 33 two ounce vials and lids, special caterpillar food, a brush, a spoon, instructions, 33 attachment squares, and a Chrysalis Station for any extra caterpillars. Open the box immediately and be ready to transfer the larvae into their little nurseries.

Before beginning, it is important to wash your hands. Place the materials on a large, clean tabletop as you will need quite a bit of space to work. It is very important to keep everything as clean as possible. Caterpillars can be sensitive to bacteria and excess moisture. Now take the following steps:

STEP 1. Separate the vials and set them aside.

STEP 2. Using the spoon, divide the nutrient equally into each vial. Using the bottom of one of the vials as a press, force the nutrient firmly into the bottom of the loaded cup. Some water may be forced out, but try not to squish out too much. Firm packing will prevent the nutrient from dislodging and perhaps crushing the larvae. Don't cap the vials yet.

Each vial lid should have air holes punched in them. If yours do not, please punch five holes with a drawing pin.

STEP 3. Using the brush, gently roll one larva on the brush and tap the brush gently against the side of the vial to gently drop the larva into the vial. Place the lid on the vial. Repeat this procedure until all larvae are in the capped vials. If you have extra caterpillars, leave them in the container in which they arrived and replace the lid. There will be enough food for them. Retain the Chrysalis Station for these caterpillars. Keep the vials upright and out of direct sunlight. Although it will be tempting to allow

your pupils to take these vials home, we recommend that you leave them as undisturbed as possible during their growth so you can have the best possible results. Now watch them grow!

- Temperature plays a very important role in the development of your caterpillars. At a constant temperature of around 24°C, the caterpillars will take three weeks to develop into butterflies. As Europe has fluctuating temperatures year round, this life cycle will take longer when it is cooler. A good estimate is three to five weeks.

- Helpful hints for cooler weather or for teachers whose classrooms are not heated on weekends/evenings: In order to maintain a constant temperature, we recommend wrapping the cups in a blanket, placing them on a high shelf and/or placing them in a cardboard box with a closed lid at night. Don't forget to take them out in the morning! (Teachers: the caterpillars will be fine in these conditions during the weekends.)

- Don't worry if your caterpillars are inactive when they first arrive; sometimes they need to rest after their journey to you, so give them a day or so to get used to their new surroundings. They may also be preparing to moult, at which time they will be still. Your caterpillars will become more and more active as they eat the food at the bottom of the cup. Eating and growing is what caterpillars do best!

- It is fine for the children to pick up the vials to get a better look inside, but make sure they are not dropped or shaken

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Webbing is a good sign!

It is common to see webbing in your vials, and your caterpillars will continue to spin as they grow. In Nature, the webbing protects the caterpillars from many dangers. Caterpillars use webbing to stick to their host plants, as the wind could otherwise easily blow them off the leaves. Caterpillars also use the silk to pull leaves around themselves to hide from predators that might like to eat them!

The caterpillar breathes through holes in its sides called spiracles. These are located on both sides of each segment.

What's an "exoskeleton"?

While we humans have skeletons inside our bodies, with tissue and skin on the outside, caterpillars' bodies are just the opposite! Their tissues are inside their bodies and the skeleton is the outside covering. That's why their skeleton is called an "exoskeleton". When caterpillars grow, the exoskeleton gets tighter and tighter. Since the exoskeleton will not stretch, caterpillars must shed their exoskeleton (moult) in order to continue growing. Your caterpillars will moult five times in total before becoming chrysalides and that's why you might see little black balls at the bottom of the cup – they're actually little balls of cast-off caterpillar exoskeleton! Sometimes you may even see the remains of the moulted exoskeleton hanging from the tip of the chrysalis.

5. Watch Them Grow and Become Chrysalides

Your caterpillars will eat, spin silk and grow for approximately 7 to 10 days before changing into chrysalides. If your environment is hot and humid, your caterpillars will develop more quickly.

During this incredible period of growth, they will shed their exoskeletons four times and grow more than 10 times their original size!

When they have finished growing, the caterpillars will climb to the top of the cup. Once there, they will hang from the lid in a "j" shape under the lid. They will shed their exoskeletons one last time (five times in total!) before they pupate (become chrysalides).

If you are lucky, you may see the skin of the caterpillar split, near the back of the head. The pupa underneath will wriggle out of this skin, forcing the empty caterpillar skin up and away from itself. You will notice the pupae is light green with the lower body similar to a smooth caterpillar. The detailed parts will flatten into a more smooth and hard chrysalis enclosure.

Do not disturb the caterpillars for at least two days (three days are recommended) in order to allow them to safely harden into chrysalides. It is crucial that they not be disturbed at this point as this is their most vulnerable stage.

While this seems a time of quiet and rest, actually it is a period of very intense activity. For within the chrysalis, old caterpillar tissues are being broken down and rearranged to form the completely different cells, tissues and organs of the mature butterfly. The gold-tipped chrysalides will remain like this for around 7 to 14 days before becoming butterflies.

Make sure you have your Insect Lore Butterfly Pavilion hatching habitat ready to receive its new tenants!

Wiggle, Wiggle, Shake!

You may find that your chrysalides will wiggle or shake dramatically when you move them to the butterfly hatching habitat - or even if you disturb them just a little.

Understandably, you might think that the butterflies are about to emerge when you see this behaviour. This unusual wiggling is a perfectly normal response in the chrysalis community. In fact, this behaviour is actually a natural defence mechanism! Chrysalides wiggle when they are disturbed in an effort to frighten potential predators.

So, the next time you see your chrysalides wiggling, you'll know they are just telling predators to stay away! Chrysalides need calm and quiet surroundings so they can metamorphose into beautiful butterflies!

6. Move Your Chrysalides into the Butterfly Hatching Habitat

We've improved the method of how the chrysalides are placed into the habitat! Once the chrysalides have formed and attached themselves to the underside of each lid, it is time to move them into their hatching habitat. It's a good idea to wait until the last caterpillar that has formed into a chrysalis has hardened for at least two days before moving all of the chrysalides from their cosy cups to their airy new home.

You will need a clean workspace. Place a paper towel on the floor of your habitat prior to moving your chrysalides, to prevent any drops of meconium from potentially staining your table top.

Carefully remove the lids with the chrysalides attached. Remove any silk strands and frass away from the chrysalides. This is a very important step! If the silk and frass is not removed, the butterflies may become entangled in the silk when they emerge from their chrysalides. Entanglement will make it difficult for the butterflies to expand their wings and can even result in deformity.

The chrysalides may move during this procedure. Do not worry; they are not about to emerge. They think they are being attacked and are using their only form of defence by trying to shake off the possible offender.

Remove the backing of one of the black adhesive attachment squares and stick to the back of a lid. This lid can now be attached to the inside of the Hatching Habitat. The spikes on the attachment square should poke through the mesh, creating a secure bond. Start at the bottom sides of the habitat and work around in a layer. Once this layer is complete, continue on the next layer up until all 33 chrysalides on lids have been secured to the mesh of the habitat. Use the Chrysalis Station box for any extra caterpillars you may have had in the original cup. Instructions for this are shown on the outside of the Chrysalis Station.

If any chrysalides have not formed on the lid or have fallen, gently scoop them up with a spoon and lay the unattached chrysalides on the paper towel on the floor of your habitat, near the side. They will emerge safely from there. Keep your butterfly habitat in a safe place.

If a chrysalis falls, what do I do?

Sometimes a chrysalis falls to the bottom of the cup before it has fully hardened. Not to worry! Leave that chrysalis there to harden for the required time. Then, take a plastic spoon, scoop the fallen chrysalis and remove any silk and frass that may be surrounding it. Place the chrysalis on a paper towel on the floor of the habitat, close to an inside wall. When the butterfly emerges, it will instinctively climb up the wall of the habitat, and then hang there to stretch and pump fluid into its wings to straighten them.

7. The Magical Moment of Emergence

For 7 to 14 days, the chrysalides may look like they are resting peacefully, but an amazing transformation is taking place inside! The caterpillar parts inside each chrysalis are liquefying and re-arranging to become the cells, tissues and organs of a beautiful butterfly. As the days pass, be sure to keep a close eye on the chrysalides.

Are your chrysalides beginning to darken? This is a big clue that your butterflies are preparing to emerge. You'll be able to see the outlines of their wings and bodies inside the chrysalides.

The magical birth of a butterfly happens surprisingly quickly. When a butterfly is ready to emerge, it takes in air through tiny spiracles (tiny holes) in the chrysalis. This added intake of air pressure helps the butterfly split the chrysalis open.

The butterfly will climb out of the split chrysalis with soft, crumpled wings and then position itself, head upward, in a vertical position. Once your butterflies have emerged, do not disturb them while they are expanding and drying their wings. Your butterflies need some time to rest and recover after their prolonged and complex transformation.

You'll see that when the butterfly first emerges, its wings are tiny and shrivelled. The butterfly will sway from side to side, forcing haemolymph (insect blood) into the veins of its wings in order to expand them to their full size. Do not touch or disturb the butterfly during this process. You may see the butterfly expel a small amount of red meconium during this wing expansion. Evidence of meconium means that your butterfly is healthy!

When a butterfly emerges, its tongue (or proboscis) begins as two long strands or halves that must be fused together. You will see the butterfly coiling and uncoiling the two halves during wing expansion. The two halves eventually join to form a tube-like tongue. The butterfly will use this tube to sip nectar.

Once its wings are fully expanded and the proboscis is fused, your butterfly is ready for flight and food!

Meconium can be a little messy

You might wonder about the small red spots you see on the sides or on the floor of your habitat after your butterflies have emerged from their chrysalides.

This red liquid is called meconium and is a normal part of the process.

When the butterfly emerges from the chrysalis, it hangs from the sides of the habitat and pumps haemolymph, or insect blood, into its wings to stretch, strengthen and harden them.

While the butterfly is stretching and hardening its wings, it expels drops of red meconium from its abdomen. It is often mistaken for blood, but it isn't blood at all. In fact, real insect blood is actually a greenish or yellowish colour! Instead, it is the leftover waste material stored in the butterfly's abdomen not needed to complete metamorphosis. This is red due to the colouring of the butterfly. By contrast, the meconium is ivory for a white silk-moth.

8. Feed and Observe Your Butterflies

One to two hours after emergence, your butterflies will be fully formed and ready to fly! You may feed your butterflies nectar (sugar-water), fruit, or nectar-bearing flowers.

5 ml Sugar / 100 ml H_2O

Fruit: Among other fruit, butterflies like fresh cut oranges, apples and old bananas. Score the fruit surfaces to create puddles of juice - making it easier for the butterflies to sip!

Nectar: Mix one teaspoon (5 ml) of sugar into a 100ml cup of water and stir. Using the pipette provided, sprinkle the nectar mixture directly onto any fresh flowers you have placed in the habitat or onto the sponge of our Flower Feeder if you purchased one. An alternative is to place a tissue saturated with the nectar onto a small plastic plate and place it in the Hatching Habitat. Do not leave an open container of sugar water in the habitat, your butterflies may fall in and drown.

Flowers: If you're unsure if your flowers are nectar-bearing, sprinkle some of the sugar-water nectar onto them daily using the pipette.

The butterfly's mouth, or proboscis, functions like a straw to sip these nutritious liquids. When not unfurled to drink, the proboscis stays curled up beneath the butterfly's head.

You will see the butterfly smell with its antennae and taste with its two front legs - these are the small furry legs near the head. Look out for them when the butterfly tastes with them before it drinks. You will see it unfurl its proboscis, drink in the nectar, then roll it back up. Feed your butterflies every day and remember to keep the nectar refrigerated between feedings.

Butterfly feeding habits in Nature

Butterflies enjoy an all-liquid diet. While they mainly feed on nectar from flowers, butterflies also occasionally sip from mud puddles rich in minerals and salts. This behaviour is called puddling. Male butterflies tend to puddle more than females; it is thought that the beneficial salts they acquire during this behaviour are transferred to the female during mating, resulting in increased egg production.

9. Set Them Free!

- The Adult Painted Lady Butterfly has a life span of 2 - 8 weeks. After you have watched, studied and shared the wonder of your butterflies for a couple of days, it's time to Let Them Go!
- Make sure that daytime temperatures are above 12°C and try to choose a day that is dry and not too windy. On cooler days, butterflies must warm their flight muscles in a sunny spot before they can fly. If a butterfly has to sit still for too long, it may be vulnerable to predators. Your butterflies will need warmth in order to fly, feed and mate.
- Simply unzip the habitat and patiently wait for the butterflies to fly away. Or, carefully and quietly allow the butterflies to crawl on your hand and fly up and away! Releasing them near flowers may encourage them to remain in your area. Your butterflies will often land on little hands and faces before saying goodbye. It's an experience your family and friends will never forget!
- Do not shake the habitat.

Your butterflies will be safe and happy in their habitat as long as you feed them as recommended. Please be sure to release your butterflies within a few days, before mating and egg laying begins. It would be a very big job to care for all of the caterpillars that hatch from the eggs! When you release your butterflies outdoors, your little friends will be free to continue the amazing life cycle all over again.

If you live in a built-up area, don't worry, the Painted Lady is a migrating butterfly and can fly thousands of kilometres to find food. They live throughout most of the world. When you release your butterflies outdoors, your little friends will be free to continue their amazing life cycle.

Remember, butterflies are important and helpful members of our environment!

A word about Painted Lady butterflies

Painted Lady butterflies are the most widely distributed butterfly species in the world, making their home on every continent except Australia and Antarctica. They are also extremely resourceful butterflies, able to live in a variety of environments, like marshes, mountains, fields and forests.

Once released, your butterflies can often be seen for several days in the vicinity, especially if you have butterfly-attracting blooms in your garden.

10. Wash Your Habitat

Your butterfly habitat is easy to clean and store away until your next project. Carefully remove each of the lids from the sides of the mesh, being extra careful not to rip the mesh. Place a drop of mild soap into a basin of water and swish your habitat in the soapy water. Rinse thoroughly. Hang your habitat to dry and it will be ready for more butterfly friends!

11. Customer Guarantee

We are proud to have been selling this product and raising butterflies since 1969. If you have any problems or questions, please contact us. We are more than happy to offer you all the help we can. If two-thirds of your caterpillars do not emerge into perfect Painted Lady butterflies, we will replace them for free. Please retain your Caterpillar Guarantee Form that is sent with each set of caterpillars. To obtain a replacement set, please fill in the form and send it back, along with your caterpillars. Please note, we only replace the caterpillars, not the habitats. Please retain your Hatching Habitat.

12. Be a Social Butterfly!

Your butterfly experience is important to us!

Please share your stories, reviews and images with us on Facebook, Pinterest, Twitter, YouTube and Instagram, or at **InsectLore.co.uk!**

Frequently Asked Questions

My caterpillars have arrived dead!

Your caterpillars are probably just fine. They do not move much in the first few days as they are preparing their bodies to moult their skin. You will see a lot of growth in the next few days. A good indication that they are fine is the presence of little balls of waste near them and silk webbing.

My caterpillars seem to be running out of food. What should I do?

Your caterpillars are sent with more than enough food to develop into healthy adults. If the food appears to be running low, it's a sign that your caterpillars are close to pupating.

Can I remove the lid of the cup and touch my caterpillars?

No. Removing the lid could introduce bacteria and mould into the caterpillar environment. Oils and salts from your hands could harm your caterpillars. Do not open the cup until your chrysalides have formed and it is time to move them to your butterfly habitat.

What are the little brown balls appearing in my cup of caterpillars?

Those little balls are "frass", or caterpillar waste. It means your caterpillars are eating and growing!

Why are my caterpillars spinning silky webbing?

It is a good sign if you see webbing in your caterpillar cup. The webbing has many uses. Caterpillars use the silk to pull leaves around themselves to hide from predators that might like to eat them. Caterpillars also use the webbing to stick to their host plants, as the wind might otherwise easily blow them off leaves. Additionally, their six true legs have hooks on the ends and they use the webbing to walk like you would climb a ladder.

What is a "chrysalis"?

A chrysalis is a pupa. When a caterpillar changes into a chrysalis, it is "pupating". Chrysalides are always bare. A cocoon does not surround them. A butterfly emerges from a chrysalis; a moth emerges from a cocoon.

All of our caterpillars have formed chrysalides except for one slow poke! What do I do?

Sometimes a caterpillar may pupate more slowly than the others. If your other chrysalides are ready to be moved to the Hatching Habitat, do so according to our instructions in section 6. If the remaining caterpillar is extremely smaller than the others, then we suggest releasing it onto nettle. It may not be eating the food as normal.

A chrysalis fell to the bottom of the culture cup. What should I do?

Gently scoop your chrysalis with a spoon, remove any silk webbing and lay it on a piece of paper towel at the bottom of your butterfly hatching habitat. It will emerge there safely.

How can I tell whether a butterfly is male or female?

Because of their egg mass, females have a larger, more rounded abdomen than males. Look at your butterflies from above. The male butterfly's abdomen has straight sides, while the female's abdomen is curved.

Notes from our founder, Carlos White, aka Dr. Entomology!

Moths & Butterflies

Butterflies and moths belong to the order Lepidoptera. One of the basic ways moths are different from butterflies is that they can fold their wings over their bodies while at rest. Butterflies cannot do this. In this respect, butterflies are actually more primitive in their development than moths. The primitive condition of wings in insects is a simple extension from the body. This can be seen in much more primitive insects such as dragonflies.

Wings

Butterflies use their wings not only to fly, but also as lures to other butterflies of their own species for mating purposes. Hence, the great variety of colours and forms has evolved for this need.

The wings can also act as camouflage in mimicking the background and environment where the butterfly rests. Note the much different colour of the undersides of the wings of the Painted lady butterfly. The colours on the underside, normally the resting position, are much more muted and neutral.

Another function of the wings is to frighten would be predators. (This can be seen in moths more so than butterflies.) Note the huge eye-spots on the wings of Peacock. This makes them appear to be a much larger and more dangerous animal.

The membrane of the wings of butterflies is overlain with thousands of rows of scales. These can be seen very easily through a microscope. The colouration of the wings is the result of the variety of colours placed upon these scales during the butterfly's formation within the pupa. Another method of colouration of the wings is the result not of pigmentation but by the placement of scales at various angles along the surface of the wing. The angles of placement combined with the smooth reflective surface of the scales catches and reflects only certain parts of the photo spectrum. The varieties of colour are due to the angle of light being reflected from the wings. Since this is not a true colour, these butterflies may appear black or very muted when the light is withdrawn.

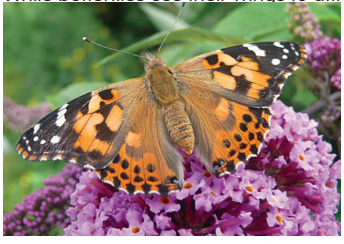
When the butterfly first emerges from its puparium the wings, of course, are minuscule. Within the membranes of the wings, however, are open veins through which the butterfly forces blood (haemolymph in the case of insects) into them under pressure. She does this through rhythmic contractions of her body to force this liquid into them under considerable pressure. The wings, being damp and flexible at the time, rapidly expand under this hydrostatic pressure.

Our Butterflies in Space!

To assure the wings will be normal, the effect of gravity must be accounted for by the butterfly. The gravity effect, if the butterfly were not at right angles to its effect, would be to deform the wet wings as they form. In 1999, NASA sent a variety of the stages of our butterflies into orbital space to examine the effect of the absence of gravity on the wing development of our butterflies. Photo footage of the emerging butterflies showed that butterflies could emerge and inflate their wings in any position they happened to be upon emergence. Therefore, the butterfly senses the pull of gravity and responds by climbing away from its effects. This is called negative geotropism. Geotropism is an orientation toward the pull of gravity.

Dating and Mating

While butterflies use their wings to attract would-be mates, moths, being nocturnal, have found another method. In the case of moths, scents are used by the female along with receptors on the male. The females scent glands are located at the tail end, while in the male, the receptors are on the antennae. Notice the bushy, comb-like antennae on the moths you see around your porch light some night. Each species manufactures a different kind of scent (pheromone) and the male of that species has perfect receptors for that particular chemical on his antennae. Males can detect the powerful scents females emit at distances up to a mile should wind conditions be just right.



The preferred time for butterflies to attract each other is in the early to late afternoons. You may notice a butterfly resting on the ground during this time with her or his wings spread open and at almost perfect right angles to the sun's rays. Butterflies, having excellent eyesight, can readily see the pattern and colouration and this triggers a response to approach. Unlike moths, both males and females will perform this procedure. They mutually attract each other as opposed to the more one-sided approach moths take.

Pollination

It would be hard to over-emphasize the importance insects play in the pollination of flowers and to our benefit. Without this essential help, much of the food we eat would not exist. Imagine life without fruits such as apples, peaches, pears, plums, cherries, or raspberries; no snacks such as walnuts or almonds; no vegetables such as beets, broccoli, cabbage, cucumbers, carrots, or tomatoes, no morning coffee or hot chocolate (cocoa)! Unthinkable! All of the above are fertilised through the pollination efforts of insects, including butterflies.

Insect Lore

Visit InsectLore.co.uk for more Butterfly fun!

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InsectLore.co.uk Send us your butterfly pics! hello@insectlore.co.uk