

# SPIDER



Learn about one of the  
largest spiders in the world.  
Cast and finish a Tarantula  
for study and display.



**SPIDER CASTING KIT**

# SPIDER

★ Read directions thoroughly before starting. ★

This kit is a fascinating, educational, and creative introduction to the world of spiders. Discover all about spiders as well as the differences between them and other insects. Cast and finish a magnificent looking Tarantula, then bend the legs for a realistic looking spider.

## MATERIALS PROVIDED

- Information about the world of spiders.
- Casting (PerfectCast) material to make a complete Tarantula. To make more Tarantulas, additional PerfectCast is available from your local retailer. **Caution: Do not place hand or any body part in casting material while it is hardening.**
- 1 mold tray containing impressions of the Tarantula and legs.
- Instructions on how to use the mold tray.
- 8 wires for the Tarantula legs. Pipe cleaners can be used for the legs if more Tarantulas are made.
- Paints and paint brush to finish the Tarantula.
- Bibliography.

## MATERIALS NEEDED

- Disposable container to mix PerfectCast™. A paper cup will work nicely.
- Mixing utensil.

**WARNING: Don't place hand in casting material while it is hardening. Don't pour excess material into drain or toilet bowl. Dispose of excess material in garbage.**

## ★ Adult supervision suggested ★

# INSTRUCTIONS

Find an area with a flat, level, stable working surface, such as a counter-top, desktop or table. Make sure the surface is waterproof; some excess water may spill out of your container. Use a disposable container to mix the PerfectCast and water.

1. Place the mold tray on a flat, stable surface.
2. At one end of each wire, bend ½" approximately 30 degrees. (See Page 10) Lay the straight ends of the wires as far into the legs as possible with the bent ends in the body of the spider.
3. In a disposable container, mix PerfectCast using a ratio (by volume) of 1 part cold water to 3 parts PerfectCast. *See tip below for estimating the amount of PerfectCast to use for your cast.*
4. Stir the PerfectCast/water mixture with a spoon or mixing stick until it is evenly mixed (about 1½ minutes). Tap the container on the table several times to remove air bubbles.
5. Pour the PerfectCast mixture into the mold.

**WARNING: Do not pour excess material into the drain or toilet bowl. Dispose of excess materials in the garbage.**

6. Let PerfectCast set for 30 to 40 minutes.
7. After the mixture hardens, carefully press the spider out of the mold. Bend each leg into the desired position. Clean off excess plaster between leg sections. Use glue to repair any breaks (glue is included in the paint pot marked GL).
8. Read the information on spiders.
9. Let cast dry for 2 hours before painting. Separate the paint pots from each other with sissors before painting. Adding a small amount of water to the paint will thin it for easier application as well as insure enough volume to cover the complete item.

**Tip:** How to measure the volume of the objects to be cast.

If you have purchased additional PerfectCast or don't want to mix all the PerfectCast included in your kit, follow the instructions below to determine how much PerfectCast to mix.

Fill all the cavities you intend to cast with water and pour into a measuring cup. This is the total volume of the finished cast.

For each fluid ounce of casting material needed, mix 1½ fluid ounces of PerfectCast and ½ fluid ounce of water. The mixture should have a consistency of a runny milkshake or melted ice cream.

Pouring all of the casting material into the disposable container while adding a little water at a time and stirring is an easy way of getting the correct consistency. This method also assures you of having enough casting material for the project.

# SPIDERS

Spiders and insects are members of a group of invertebrates called arthropod. Arthropoda are the most enduring creatures of all the animal kingdom. There are more known species of Arthropoda than all other kinds of animals. Arthropoda make up approximately seventy five percent of all the animals in the world. They are very adaptable and live everywhere; in the air, land and in water. Spiders have been on the Earth long before birds and mammals appeared. It is thought that spiders were among the first creatures to have left the water to live on land.

Most people mistakenly believe that spiders are insects. Indeed, spiders do have some things in common with insects, such as jointed legs and segmented external skeletons. But the differences between these two Arthropoda are quite evident. Insects have six legs, three body parts with antennae and are usually equipped with wings. A spider has eight legs, two body sections and has no wings or antennae. All spiders have silk glands and make silk for a variety of uses. Spiders' diets consist primarily of insects.

## **Spiders have two body sections**

### **Cephalothorax or Prosoma**

The Cephalothorax is the segment that contains the eyes, mouth (chelicerae), pedipalps, brain, poison glands and stomach. Four pairs of legs are attached to the underside. The cephalothorax is covered with a protective outer covering called the carapace.

### **Eyes**

Although most spiders have eight eyes, the number of eyes can vary between six, four, two and one, depending on the species. The position of the eyes differ among the various species. Their number, arrangement and positions on the head can be used to identify the species to which the spider belongs. A spider's eyesight is very limited. They do not see much detail but can distinguish shades of light and dark. Spiders rely more heavily on their sense of touch than their sight.

### **Jaws, Mouth, and Pedipalp**

Located at the front of the cephalothorax are the mouth, jaws (chelicerae) and a pair of short leg-like appendages (pedipalp). The two jaws have claw-like end joints that hinge like

the blade of a jackknife. The chelicerae contain needlelike fangs used by the spider to pierce its prey. Venom flows through the fangs and into the prey. Having paralyzed its victim, the spider uses its jaws and pedipalp to crush the body while flooding it with fluid that predigests the tissue. This predigested liquid is then sucked into the stomach through a very small mouth. This process can take hours.

Attached to the underside of the cephalothorax are four pairs of legs. Each of the spider's eight legs have seven segments held together with joints. The end segments usually have two or three claws. To walk a spider moves the first and third leg on one side along with the second and fourth legs on the other side. After these legs complete the stride, the remaining legs move forward. There is hair on a spider's legs. Some spiders secrete a sticky substance from the top segment of the leg. This sticky substance enables the spider to walk up slippery surfaces.

The cephalothorax and abdomen are joined together by a thin stalk called a pedicel.

### **Abdomen or Opisthosoma**

The abdomen is the segment which contains the heart, digestive tract, reproductive organs and book lungs and silk glands. Appendages called spinnerets are visible externally on most spiders. They are the apparatus which spins and disperses the silk. The upper portion of the abdomen is covered by a protective armor that is not as tough as that which covers the cephalothorax.

### **Book lungs and/or tracheae**

Spiders breathe through either book lungs (two pair or one), tracheae or both. Tracheae are a system of tubes that carry air throughout a spider's body. Book lungs are organs which contain folds of thin tissue that resemble pages of a book. The air is brought into the lungs through slits along the underside of the abdomen. The spider's blood circulates inside this page-like tissue and exchanges carbon dioxide for the oxygen that collects in between the tissue. From the lungs the oxygenated blood goes to the heart. The heart disburses the blood through a network of spaces in the tissue throughout all parts of the body.

### **Spinnerets**

Silk is produced in the silk glands. It begins as a liquid substance which flows through a series of tubes and out fingerlike

appendages called spinnerets. The spinnerets are set close together and are composed of hundreds of tubes tipped with flexible nozzles. These spinnerets are located at the end of the spider. The number of spinnerets are varied among species, The majority of species have six spinnerets, but some spiders have as many as eight or as few as two.

When the silk leaves the spinnerets it is in liquid form. To make a strand of silk the spider deposits the liquid to something outside its body and then moves away. The process of stretching the liquid makes a strong strand of silk. A spider can weave a series of intricate patterns by moving its spinnerets.

Spiders use their silk in a variety of ways. Spiders can use their silk to protect its eggs, to make traps for insects, and to build nests. Most spiders have a strand of silk trailing behind them at all times. Much like the safety ropes protect a mountain climber, this strand serves as a life line for the spider and prevents the spider from a life threatening fall. Newborn spiders use their silk for transportation. They climb to an elevated spot and release silk, as the silk lengthens the wind will lift the spider off its perch and carry it to a new area.

### **Molting**

To grow the spider must shed its hard outer skeleton. This process is called molting. A spider usually molts four to twelve times before maturity. For a short time after a molt the spider is very vulnerable because its new skeleton is soft. It takes several hours for its new coat to become strong enough for protection.

# TARANTULA

There are approximately 37,000 species of spiders that have been identified to date. It is thought that there are untold numbers yet to be named. Spiders live all over the world and can thrive in the most unlikely and toughest of conditions. There are spiders that are as small as .16 inch and as large as 11 inches (including leg span). The tarantula is among the largest spiders in the world. They belong to a group of spiders called *Mygalomorphae*. They are distinguished from other spiders by their spinnerets. They have only two large spinnerets and two very small ones.

Tarantulas can be found in a variety of locations throughout the world. Many species of tarantulas can be found living in tropical climates. The warm humid conditions provides perfect living conditions for these creatures. Many tropical tarantulas live in trees.

A number of tarantulas live in hot arid desert areas of the world. These desert dwellers make their homes in burrows underground. During the hot daylight hours they stay cool in the deep recesses of their underground habitat. In the cool of the evening, these tarantulas crawl out of their burrows to wait for an edible creature to amble nearby.

Tarantulas are very hairy. Their body is covered with long bristlelike hairs called setae. Some of the hair have sensory nerves at their hollow base. These hairs can be sensitive to motion and temperature. Tarantulas are sensitive to vibrations transmitted through the ground. Vibrations can help them detect nearby prey and also to sense when danger is nearby. Located around the mouth and chelicerae are hairs which are capable of sensing chemicals. This sense roughly corresponds to a combined sense and taste in animals. There is also hair located under the abdomen which has sharp tips with microscopic barbs. When it is threatened the spider can push these hairs into its attacker, causing itching or pain. These hairs are called urticating hairs.

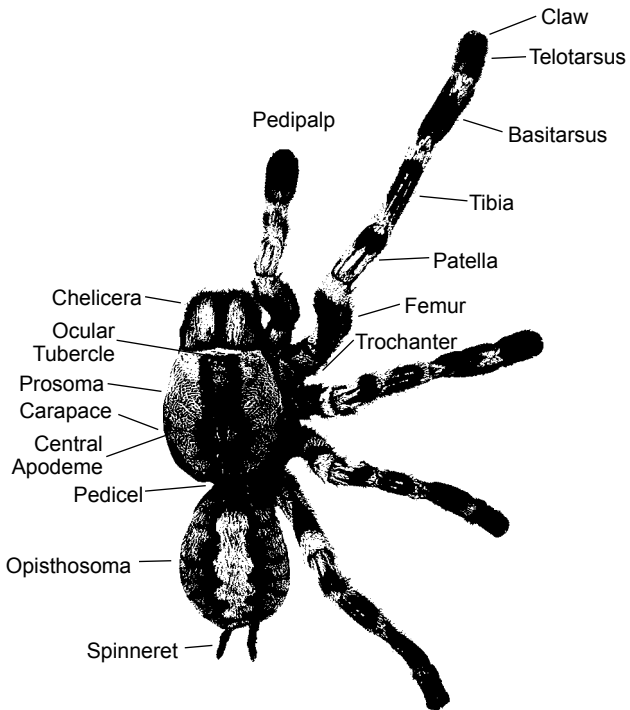
A tarantula's pedipalps are loaded with sensory hair. The spider uses its pedipalps to feel its way when it walks. When a tarantula feels threatened it will rear up on its hind legs raise its pedipalps in the air, exposing its opened fangs. Some spiders can also make a hissing or buzzing sound when threatened. They make this sound by rubbing their chelicerae together. This sound is called stridulation.

All spiders spin silk and the tarantula is no exception. They use silk for many reasons. They sometimes line their nest with silk. Female tarantulas make eggsacs to hold its eggs, males make a temporary web to hold its sperm while searching for a female. Some spiders spin silk over the entrance to its burrow to guard against intruders. If they are going to leave their burrow, they produce drag lines to help them find their way home.

Unlike most spiders, tarantulas eat a variety of small creatures as well as insects. They have been known to eat small frogs and lizards. The tarantula will lay silk strands out around their burrow. These strands serve as trip wires. When potential prey walks into these strands, the tarantula is alerted and emerges from his home to deliver its venomous bite.

After paralyzing its victim, the tarantula delivers digestive enzymes into its victim. This enzyme liquifies its prey. The spiders narrow mouth then sucks its liquified prey into its stomach.

# TARANTULA ANATOMY

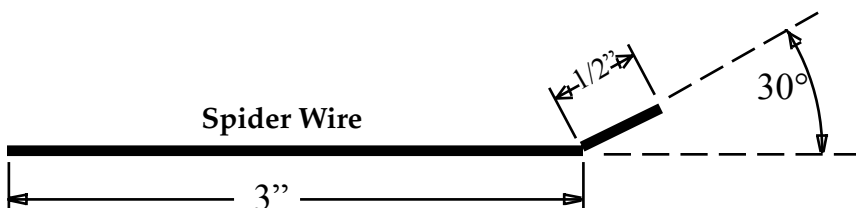


# HELPFUL HINTS FOR BUILDING YOUR TARANTULA.

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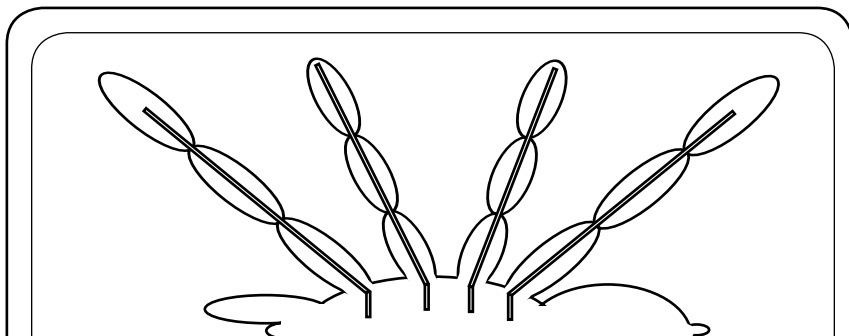
## Bending the wire

1. Each wire should be approximately  $3\frac{1}{2}$ " long.
  2. Mark each wire at 3".
  3. Bend each wire  $30^\circ$  at the 3" mark you made.
- \* The diagram below is exactly to scale. You can place each piece of wire on top of the diagram to check for accuracy.



## Placing wire into the mold

1. Place each piece of wire into the mold with the short bent end facing down into the body.
  2. Make sure the wire is extended into the leg as far as possible while keeping the bent end inside the body.
- \* The diagram below is not to scale. It should be used as a visual reference only.



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- Markle, S., (1994) *Outside and Inside Spiders*, Macmillan Publishing Co., New York, N.Y..
- Mound, L.A., (1990), *Eyewitness Insect*, Alfred A. Knopf, Inc., New York.
- Rankin, W., Walls, J. (1994) *Tarantulas and Scorpions*, T.F.C. Publications, Inc., Neptune City, N.J..
- Schultz, s., Schultz, J. (1998) *The Tarantula Keeper's Guide*, Barrons, Hauppauge, N.Y.

## COLOR MIXING GUIDE

Kits come with different sets of colors depending on the title of the kit. Mixing instructions may include colors not included in your kit.

Acrylic paints can be thinned with water if they get too thick. Be sure to clean brushes with soap and water before the paint hardens or the paint will become permanent.

Primary colors can be mixed to obtain many other colors. Mix a small amount of two or more colors on a non-absorbent surface.

Always begin with more of the lighter color and a small amount of the darker color. To darken or lighten colors, add small amounts of black, brown or white and mix. Take your time and allow the paint to mix thoroughly before adding more paint.

- White skin - add small amounts of red and yellow to white
- Black/brown skin - add small amounts of white, yellow, red & black
- Army green - mix blue and yellow and a small amount of black
- Ammonite green - mix blue and yellow and a small amount of white
- Carmel - mix small amounts of brown and yellow to white
- Tan or beige - add small amounts of red, brown and yellow to white
- Brown - mix black, yellow, red and green
- Orange - add small amounts of red with yellow
- Gray - mix small amounts of black with white
- Pink - mix small amounts of red with white
- Purple - mix red and blue
- Gold - mix small amounts of yellow with silver
- The pot labeled GL is glue
- Some kits come with a pot labeled ST. This is stain that can be used to antique your creation after painting. Paint on and wipe off.

Download other Kit brochures at: <http://skullduggery.com>

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