[www.herpetologyonline.com](http://www.herpetologyonline.com)

Basics

UV lighting

It is important that reptiles receive UV lighting that is full spectrum (Containing UVA and UVB). UVA is important in reptile vision, they have

four types of cones in their eyes, red, green and blue as well as one that allows them to see UVA wavelengths, this aids them in hunting, socialising and many other natural activities. UVA allows them to identify food and other animals of the same species. Having UVA aids in less stress and increases the animals over all well-being. UVB on the other hand helps the animals synthesize calcium in the diet. The skills cells produce vitamin D3 which allows the calcium from the diet to be utilised inside the body, for strong bones and growth. D3 also helps the immune system of the animal and helps organs develop and grow properly. Animals that do not receive enough calcium can end up with hypocalcaemia (calcium deficiency) which leads to life threatening diseases such as metabolic bone disease(common in animals who have improper husbandry).

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To assure you allow for the best utilisation for your reptile friend it is important that the bulb is fair enough away that it doesn't rise skin temperatures and therefore impair vitamin D synthesis but is low enough that the reptile can still use it to create vitamin D, it needs to fall in the wavelength range of 290 and 320 nm, so you want it set around 12inchs to 18ichs from the area your reptile occupies. Glass and other materials can block the rays so you want it over mesh if the lighting is being given from outside the vivarium, if it's inside then there is no worries. A reflector often advised as many of the rays can be lost from the top of the light bulb, the reflector will allow this to be caught and pointed back into the animals enclosure. Always read the information given by your lighting company, some will recommend 6 months before changing the bulb where others will say 12, depending on how long their product is recommended depends on how often it should be replaced. This will also tell you what percentage bulb the bulb is, you will find out from researching your animal what UV percent is suggested. Wattage on these tube bulbs will be to do with the amount of power they give out, you will find the higher the wattage the longer the bulb. You want a bulb that stretches across most of the vivarium,  but still leaves a gap either side. You will need a UV starter motor, make sure it can cope with the wattage of your bulb, the package will tell you this. Then a timer is suggested, in the summer have the bulb on for longer than winter as this helps you give your animals seasons cycles. For example in the summer 8am-8pm and then the winter 9am-6pm (this can be adjusted to suite the animals needs depending on their natural environments.) Not all species will require UV lighting, some may say supplementing enough, however read the care sheets that are offered on the site and speak to other reptile keepers and find out what they recommend.

Heating

​There are three main way to heat your enclosure. The first is ceramic heaters, ceramic heaters are not the cheapest to set up. The bulbs tend to last

a long time and range from wattages of 50w-250w, and can therefore be more cost effective in the long run. Ceramics are beneficial because they do not give out any lighting, making it suitable to stay on all night (even if you just drop the temperature depending on your species) and therefore allowing a correct day/night cycle. They can however get very hot due to the fact they are infra-red dull emitters, so a guard should always be used with them.

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Heat mats are another source of heat, there are two types known as standard and then radiant heat mats. Both are extremely similar. These mats work great for animals that require underbelly heat or spend most of the time on the ground however it has been known for animals to kick their substrate away and burn themselves on them as heat mats are close contact. Basic heat mats only work by heating what they touch and not the air around it, so for arboreal species this type of heating is not recommended. Radiant heat mats work much better at projecting the heat, however they are not that strong and work better as an additional heat source than the main heat source. They are not too expensive but also not too cheap. These mats should only be placed on one side of the vivarium in order to create a hot and cold side, the temperature required will differ depending on species.

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The third source of heat is from a light emitting heat bulb, these are cheap and easy to set up however the bulbs lifespan will vary, some may last months others maybe only a few days, these heat sources work great if you turn the heating off at night or use a no light emitting heat source as it can aid in lighting your enclosure. However a fall back of this equipment is the fact it produces light, because of this, if the heat is required to be on 24/7 then it does not allow your reptiles to establish a day/night cycle as there is always light.

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Heat strips are also well known for those that use racking systems, these work similarly to heat mats but because they are for smaller environments it can efficiently heat the area.

Heat rocks/hot rocks are also well known, however there are many case of animals being burnt so these are often advised against.

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Heating is also recommended to be used with a thermostat, however

There are many different types depending on your heat source,

so please look at the thermostat second below.

Thermostats

Depending on what heating source you opt for will depend

what type of thermostat you need. These are recommended if not

a necessity for your animal’s care. Each brand will have their own name for the thermostat type. The most commonly used are microclimate and habistat. All thermostats will have different wattages, so make sure you buy one that reaches the animals basking spot heat. All of them have a probe which is placed on the vivarium, this often goes down the hot end or near the basking spot. Then there is a box which you set the desired heat on (this can also be an electronic touch screen depending on the model) and will have a plug to plug into the wall and a plug input which the heat source is plugged into. Pulse style thermostats which send waves of electricity are used for ceramic heaters, as ceramics work by sending waves of heat, these wave strengths will differ depending on how much heat is required, this type of thermostat is also recommended for heat strips/cables. There is on and off thermostats which are often used for heat mats and radiant heat mats, these have the heat source on then when it researches the temperature turn off. Finally, there is dimmer thermostats, which work for light emitting heat sources and dim the lighting, reducing the heat given so you may see the light given out go up or down and sometimes completely off if the vivarium does not require constant heat. Some thermostats may do multiple heat sources at different temperatures to allow for multiple vivariums or even multiple heat sources (these may be handy if day and night heating are separate). Thermostats are also great because this allows for peace of mind, knowing that your equipment will not over heat to burn your reptile or make the environment too hot/cold and will also reduce the risk of fires. It is possible to run each of these thermostats on the different heat sources however this can cause your thermostat fuse to blow, blow your light bulbs and will not be as effective at maintaining temperature as the correct thermostat. For example a on and off thermostat can be used on a light emitting heat source, but this will constantly be turning the light on and off and can blow your bulb’s filament much quicker than usual. Some thermostats can also control humidity too, depending on what one you go for, it allows the humidity device to be plugged in and regulated.

Substrates

There are many different substrates you can use, depending on

how you want your vivarium to look and what pros and cons you

prefer. It may also depend on whether you need a humid environment. All need replacing/cleaning monthly as well as spot cleaning, with the enclosure disinfected with reptile disinfectant when cleaned.

Sand

Fine/Silica (chunky)/Play sand

Fine sand and play (childrens) sand are great as a heat conductor, so for those that use heat matts this may be a good option, they often work well for desert species. Silica sand however can cause a lot of dust and can cause breathing problems. Sand can also increase risk of impaction(where the cloaca and gut gets clogged and the reptile cannot pass waste), so the smaller the particles the easier it is for them to pass should the eat it during hunting, some may argue that this only really occurs through improper husbandry.

Wood substrates

Bark/woodchips/mulch

All of which hold similar properties just give different looks. If ingested, it may cause serious harm to the animal, they're not great conductors of heat and are not really comfortable for species that like to dig and burrow. Once soiled it should be removed. However, mixed with soil can give the soil some texture.

Easy clean

newspaper/paper towels/reptile carpet/Tiles

These do not look as natural in the enclosure but they are cheap and easy to maintain and replace, there is a low risk of ingestion and it's easy to see where the animal as soiled to make for quick cleaning. Hatchlings are recommended for this substrate as they are messy and uncoordinated hunters. Reptile carpet and tiles are reusable when washed with reptile disinfectant however it has been said that long time exposure to 'hard' flooring can cause joint problems for the reptiles and carpet has been known for claws to sometimes get stuck in

soils and mosses

coco peat/top soil/ moss

Most people will add moss to the top/soil mix as this can help hold moisture. coco peat is a reptile safe dirt and top soil can also be used, if you're going to use brands that aren't advertised for reptiles it must be untreated and have no chemicals/pesticides in it. Using mud from outside is not recommended as this could contain bacteria/parasites. It's great for burrowing and species that need moisture.

Most people tend to use a top soil mix for bioactive set ups/burrowing set ups and this is now also heading towards desert species but with lest moisture to the mix as it is safer where it bounds together and looks more pleasing.

a top soil mix tends to contain coco peat/soil, moss and some sort

of wood chipping.

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Humidity

Humidity is the act of keeping the air in the vivarium moist. humidity

is important for tropical species and desert species but in opposite ways,

for example tropic species will require it because through evolution they have adapted to moist environments, so this can cause problems with shedding as they are used to having the moisture to aid in this. Some montane (mountain living) species may even use the air's vapour as an intake of moisture as appose to drinking, however for desert species who are used to no moisture this may cause respiratory problems as their lungs are not equipped to deal with the level of moisture.

To measure the humidity in the environment a hygrometer is need. These can be small gauges or even electronic, some thermostats may also have this built in. Each species will have its own humidity level.

Too much humidity?

Change your substrate or let it dry out, substrates that get wet can take a few days to dry out, but can eventually do so, some may become dusty, if this is the case you may want to reconsider what substrate you use. Change your enclosure, tall and narrow enclosures have less air flow, meaning moisture lingers, so it may be time for your little one to have a new enclosure. Move your water dish, having it down the hot ends causes the water to evaporate and linger in the air, so move it to the cool side.

Not enough humidity?

Change your substrate to something that can hold moisture like coco peat or a top soil mix. Spray more, if you're spraying by hand up the amount of times you do it or the length of time you do it for, if you can't because of work it may be worth investing in a specialised thermostat that deals with humidity and allows you to add a misting system to it. If you can get it down to a fine art and want a cheaper option, work out how long your pet needs spraying and how often and set up a cheap humidifier from a local store and create pipe work to hook it all up while having a timer go off at set times for a set amount of time, this my take a while to get it right, so careful observation may be needed.

There are many options for upping or losing humidity for your reptile, but it is extremely important that you get it right as this can cause so many problems, like respiratory infections which can be costly to you and deadly to your reptile. Shedding problems also occur if your environment is too dry which can lead to loss of toes, tails and spikes. Humidity isn't too hard to get right once you know how to do it!

Supplementing

There are many different supplements you can give your reptile depending on what they need and how often they need it.

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D3 supplements - this only should be given if your animal doesn't live outside

all year round, if it does, what it will get from the natural sunlight will be enough. Not much D3 should be given if they have a T8 lightbulb and even less with a T5. Vitamin D3 is vital in your reptiles ability to use calcium. this can be dusted on food, left in a bowl or liquid versions are available to put in water. Signs of a Vitamin D deficiency is very similar to a calcium deficiency as they often work together, signs of this can be pale skin, lethargic, bones bowing or displacing.

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Calcium - Every reptile should get this, no questions asked. However, if they eat full prey (mice, rats, chicks) they will not need calcium supplements, this will be derived from the bones of the prey. However all other reptiles will need calcium supplements. This can be given by dusting their food or some people will leave little bowls of it for the reptiles to help themselves. This is vital as it can cause serve health problems such as metabolic bone disease which can, and will, kill your reptile if it's not treated.

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Phosphorus - This is also important and rarely spoken about, when giving calcium this should also be given as phosphorus takes part in the calcium-D3 cycle. As a rule of thumb for every 2 parts calcium there should be 1 part phosphorus.

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Vitamin A - Vitamin A is important as it aids in repair and growth however reptiles can create this naturally when provided with carotenoids, it works as an antioxidant and allows for proper functioning ducts, mucous membranes, and well-functioning eyes and skin, without it your reptile can get very ill, often it will also mean your reptile has a vitamin E deficiency too as they work together in the body's functions. Signs of a deficiency can be swollen eyes, runny/gunky noses and fungal infections.

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Always check your supplements you give your reptiles as not all of them will contain everything, so it is important you get ones that either contain all or a few that contain different things so your reptile can get well rounded supplements.

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Just remember, research how much to give them! Giving them too much is just as bad as not giving them enough and can cause serious toxicity to them. As a rule of thumb calcium should be given every other day, Vitamin D once a week

if a UV is used and if it's not every other day like the calcium. Vitamin A

every week/two weeks. Remember, this differs for different species and

therefore cannot be applied to all as they may need more or less

than this, so research long and hard.

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