

## DIY Crystal Critters

---

**Safety Warning: Keep all chemicals used in this activity away from younger children. Avoid unnecessary contact, don't rub it in your eyes, and do not ingest. Adult supervision is required for this project.**

---



Our crystal dog and chameleon were two of our favorite critters during this investigation, not only because they're so adorable, but because they're the perfect examples to use in our instructions below. Your kids can easily modify their poses with slight alterations to their legs or curls in their tail. Help your kids design their dog in a playful 'downward dog' pose with a crystallized ball designed out of pipe cleaners next to him. Or help them curl the legs of their chameleon inward so it can grab hold of a pencil or small branch.

### Crystal Critter Procedure

The first step in making Crystal Critters is having your kids create their pipe cleaner critters and deciding which sections of their critters they'd like the crystals to grow on. Our instructions will have crystals growing on the coiled body, and sometimes the tip of a tail.

Once your kids have their critters ready, they will soak them in a Borax solution. All exposed areas of the pipe cleaner body will act as a base for the crystals to attach to, and if you use a clear container to hold everything, your kids can periodically check on how their crystals are progressing.

To create the Borax solution, help your kids dissolve the Borax powder in hot water one tablespoon at a time until the solution is fully saturated. You'll know your solution is fully saturated when the hot water starts to become cloudy and Borax powder starts to settle on the bottom of the pan.

Once the solution is poured in the critter container to cool, crystals will appear on any exposed areas of the pipe cleaners. This occurs because hot water can hold more Borax than cold water, causing crystals to form as the Borax 'falls' out of the cooling solution. The hot water can hold more than the cold water because the higher the temperature of the water, the more space between molecules, allowing more room for the powder.

The sections covered by a piece of straw will be too smooth for any decent crystal formation, and any crystal that does form can be carefully removed as you remove the straw from your critter.

**Note:** Cooling your Borax solution slowly by placing the container in a pan of hot water will create larger crystals. We preferred the smaller crystals for our pipe cleaner bodies, but it's another area your kids can experiment with.

### Step 1 - Supplies:



**Note:** Make sure your solution container is large enough to hold your kid's pipe cleaner critter without touching the sides or bottom of the container.

### Step 2 - Crystal Critter Build Steps:



Image 2.1



Image 2.2



Image 2.3

**2.1 Body** - Have your kids pick the color of pipe cleaner they'd like to use for their critter's body. Help them wrap the whole pipe cleaner around a sharpie marker or another round object about the same diameter. This size coil, covered with crystals, ended up with a center hole that was the perfect size for attaching the head. Plus, this size coil created a body light enough for the legs to support (see **Image 2.1**).

**2.2 Legs** - Once your kids decide on a color for their critter's legs, help them cut their 2nd pipe cleaner in half. Set one half aside, then help your kids cut the other section in half again. These two 1/4 length pieces of pipe cleaner will be the two sets of legs for their critter.

**2.3** Thread one of the 1/4 length sections of the pipe cleaner around the second loop at one end of your coil, then fold it in half. Be sure that the pipe cleaner section is folded up and around the second loop of the body, then twist it together a couple of times (like a twisty tie on a loaf of bread) to secure the legs to

the body. Repeat this for the second set of legs on the opposite end of the pipe cleaner coil (see **Image 2.2**).

**Note:** We found it easier to add the legs once we placed the body back over the sharpie pen. This prevented our coiled body from losing its shape.

**2.4** Now have your kids bend the legs to the style they want for their critter. Are they making a dog that needs longer legs bent near the body, or maybe a chameleon whose legs should go out straight, with only a small bend at the end (see **Image 2.3**)?

**Note:** Whatever style leg your kids decide on, this is only a temporary look for the leg. Once the crystals are done forming on the body, and the protective straws removed from the legs, your kids will wrap additional pipe cleaners around the leg and tail areas. The pieces of straw stopped the crystals from forming in those areas, but the pipe cleaner still turned stiff and gritty from the Borax solution.



Image 2.4



Image 2.5



Image 2.6

**2.5 Tail** - Now have your kids use the 1/2 piece of pipe cleaner left over from **step 2.2** (or another piece of pipe cleaner of similar size if they want a different color) for the tail. Help them wrap the end of the tail around the end of the back-coil section. Twist the end of the tail 2-3 times around the end of the coil for decent support (see **Image 2.4**).

**Note:** Your kids will attach the critter's head after soaking the rest of the body in the Borax solution overnight, so we'll build that later.

**2.6 Prep for Borax Solution** - Have your kids cut 4 pieces of straw long enough to cover each of the legs and one slightly longer piece of straw for the tail. Have your kids slide the straws over the legs and tail (see **Image 2.5**).

**Note:** The straw only covers the bottom 2/3 of our dog's tail, allowing the tip of its tail to grow crystals too.

**2.7** Once your kids have finished building their pipe cleaner critters and straws are covering any sections where they don't want crystals to grow, help them tie their critter to a popsicle stick or something similar.

**2.8** Your kids can now hang their critter in the container, wrapping any extra thread around the popsicle stick until the critter is hanging at the right height. Nothing should be touching the bottom or sides of the container (see **Image 2.6**).

**Note:** We usually looped our thread around the top coil of our critter so it would hang vertically in the container. If your critters are too long for this method, loop the thread around a coil in the center of the critter body so it can hang horizontally.



Image 2.7



Image 2.8



Image 2.9

**2.9 Borax Crystal Solution** - Measure the amount of water your solution container can hold, then round this amount up to the nearest cup. This is the amount of water you will want to add to your pan (see **Image 2.7**).

**2.10** Bring your pan of water to a boil, then remove from heat (see **Image 2.8**).

**2.11** Add Borax to the hot water, one tablespoon at a time, stirring continuously until the water is fully saturated. Your water will be fully saturated with Borax when it starts to look cloudy and you can see the powder start to settle on the bottom of the pan. We used 6-7 tablespoons of Borax per cup of water for our crystal critters before the water started to look cloudy (see **Image 2.9**).

**Note:** If your kids have decided to color their crystals, add the food coloring to your saturated solution now.



Image 2.10



Image 2.11



Image 2.12

**2.12** Bring the solution to a boil one more time. This will allow the last of the Borax to dissolve since the hotter the water the more Borax it can hold. Plus, you want your solution as hot as possible before pouring it in your container (see **Image 2.10**).

**2.13** Carefully fill your container with the saturated solution, then gently place your pipe cleaner critter in the solution until the popsicle stick rests on the top of your container. Make sure that your pipe cleaner critter or the straw pieces aren't touching the bottom or sides of your container or they will harden to the container as the crystals grow (see **Image 2.11**).

**Note:** If one of the straws does end up touching the side or bottom of the container at some point due to movement in the container don't panic. This happened to us a couple of times and we were able to gently remove the straw from our critters.

**2.14** Let the pipe cleaner critter sit in the Borax solution overnight for optimum crystal growth.

**Note:** You and your kids may want to check on how the crystals are growing periodically. Your crystals may not need to soak overnight, especially if you worked on this project first thing in the morning.

**2.15** Once your kids are happy with the size of the crystals on their critter, carefully remove it from the container and set it on a rack or paper towel to dry. Trim the thread and gently remove the sections of straw from the legs and tail area (**see Image 2.12**).

**Note:** If your kids added food coloring to their Borax solution, you may want to seal the crystals after they dry, otherwise, the food coloring will fade. We like to use a spray can of clear finish, but you can also use nail polish or another clear sealant you have around your house.



Image 2.13



Image 2.14



Image 2.15

**Note:** Remember, your kids can easily modify the poses of these critters with slight alterations to their legs or curls in their tail. Help your kids design their dog in a playful 'downward dog' pose with a crystal ball designed out of pipe cleaners next to him. Or help them curl the legs of their chameleon inward so it can grab hold of a pencil or small branch.

**2.16 Leg Attachments** - As we mentioned earlier, the sections of pipe cleaner covered by straws in **step 2.6** will be stiff and gritty. How your kids upgrade the legs and tail of their critters is another step where they can use some of their own creativity. The two methods that worked well for us were coils and wrapping.

**2.17** Have your kids choose what color pipe cleaner they'd like to use for the legs of their critter, then help them cut it into four equal sections. For our dog, we wrapped each 1/4 length piece of the brown pipe cleaner around a chopstick to create four coiled sections to use in the next step. For our chameleon, we just needed the four equal lengths of green pipe cleaner (**see Image 2.13**).

**2.18** Attach the pipe cleaner leg attachments created in the previous step. If your kids created coils, they should be able to gently twist and slide them over the original four legs. For our chameleon, coils didn't look right. We preferred wrapping them carefully around the original legs with a few evenly spaced spirals, like the coils, but less springy looking. We then bent the ends of our green pipe cleaners to resemble the chameleon's feet (**see Image 2.14**).

**2.19 Tail Attachment** - Have your kids choose what color pipe cleaner they'd like to use for their critter's tail and shape it if necessary. We needed another 1/4 length piece of brown pipe cleaner for our dog's tail, and a 1/3 length piece of green pipe cleaner for our chameleon's tail. We wrapped our green piece of the pipe cleaner around the popsicle stick, then carefully stretched it out to create a longer tail that we curled at the end for the chameleon (see **Image 2.15**).



Image 2.16



Image 2.17



Image 2.18

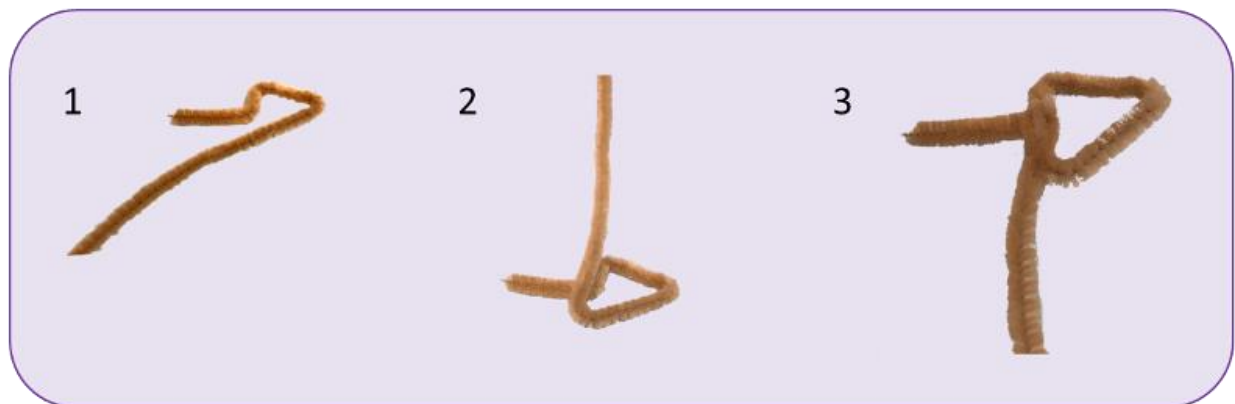
**2.20** Attach the pipe cleaner tail attachment created in the previous step. If your kids created a coiled tail, they should be able to gently twist and slide it over the original tail, which is how we attached our chameleon's tail. We wanted a coiled tail attachment for our dog too but had to coil it around the original tail directly because of the crystal tip of our dog's tail (see **Image 2.16**).

**2.21** Help your kids gather the supplies for their critter's head. We used pipe cleaners, googly eyes, and Instant Tacky sticky dots to attach the eyes (see **Image 2.17**).

**2.22** We have two different head designs that you can check out below, one for the dog and one for the chameleon. Like we said though, we did struggle a little with our critter heads.

**2.23** Help your kids gently insert the end of their critter's head into the center of their critter's coiled body, then glue it into place (see **Image 2.18**).

### Dog's Head



**1.** The head will be the toughest section for your kids to build on their Crystal Critter. Once your kids have decided on what color of pipe cleaner they'd like to use for their dog's head, help them bend it so it

resembles the pipe cleaner in **Step 1** above. This will be the dog's neck and the first 1/2 of the triangular shaped outline of his head.

2. Next, your kids need to bend the pipe cleaner as shown in **Step 2** above, which will finish the outline of the dog's head.

**Note:** Once the pipe cleaner reaches the first half of the outline from **Step 1**, make sure your kids have the straight section of the pipe cleaner sitting on top of the neck section, not under it.

3. Help your kids fold the straight section of the pipe cleaner around then under the neck section so it looks like the pipe cleaner is **Step 3** above. This fold will help hold the dog's triangular shaped head together.

**Note:** The exact length of the neck and the triangular outline of the dog's head will depend on what size head your kids would like their dog to have. A larger head will just need additional pipe cleaner to finish wrapping around the outline in **Step 5** below.



4. Your kids are ready to wrap the rest of the pipe cleaner around the outline of their dog's head, continuing in an up & over, then under motion as seen in **Step 4** above.

**Note:** Make sure your kids don't wrap any pipe cleaner around the neck on the left side of the head. This section will be inserted into the center of the coiled body after it's covered in crystals.

5. Depending on the size of the outline your kids made in **Steps 1 & 2**, they may need another section of pipe cleaner. This could be a good time for your kids to be creative and make the tip of their dog's nose a different color. Once finished, the triangular head should be completely covered as shown in **Step 5** above.

**Note:** It's hard to see in the image from Step 5, but we tucked the end of the pipe cleaner under one of the loops wrapped around the outline.

6. The main part of the head is done, but it doesn't really look like a head quite yet. Have your kids gently bend the head around the curve of a marker similar in size to a Sharpie as shown in **Step 6** above.



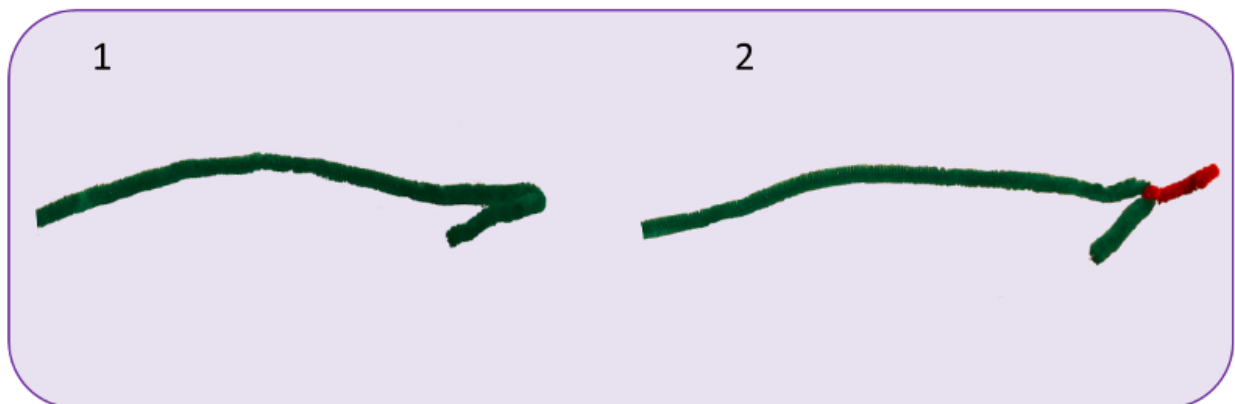
7. If your kids turn the head over, it should have an indentation like the image shown in **Step 7** above. If not, they can gently mold the head some more until they like the shape.

8. Once your kids decide on an ear color, help them cut two small sections for the ears. Your kids can shape the ears any way they like, but we bent ours, so the top of each ear was wider than the bottom and the tips were bent forward like a puppy's ears. Insert the ears between the last couple of pipe cleaner loops near the neck as shown in **Step 8** above.

**Note:** You may want to glue the dog's ears in place, depending on how tightly wrapped the loops are.

9. All that's left is to attach the googly eyes as shown in **Step 9** above. We prefer to use the Instant Tacky sticky dots, but you can use whatever adhesive you have around the house.

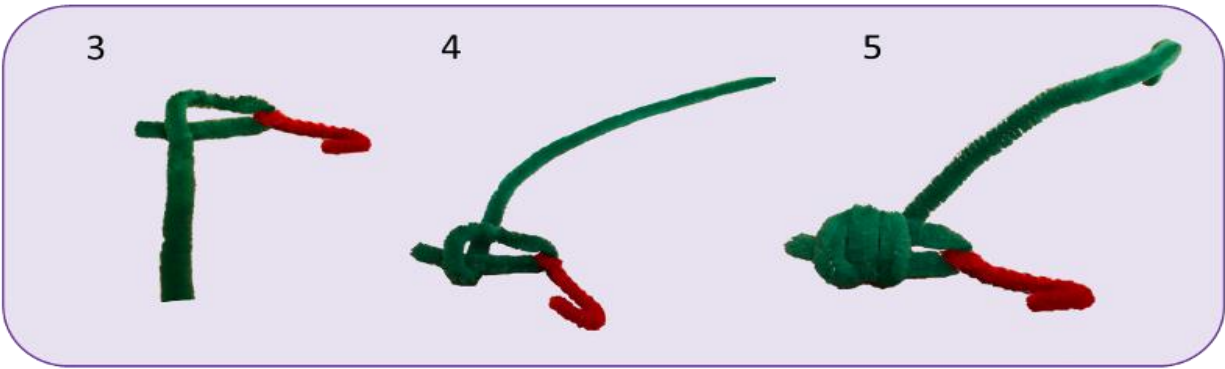
### Chameleon's Head



1. Our chameleon's head isn't quite as difficult as the dog's head we just discussed. Let your kids choose a color of pipe cleaner for their chameleon's head, then help them bend one end of it so it resembles the pipe cleaner in **Step 1** above. This will be the chameleon's neck and part of the outline of its head.

2. Next, your kids need to wrap a small section of a red pipe cleaner around the bent area from the previous step for the chameleon's tongue, as shown in **Step 2** above. We recommend your kids make the tongue long enough to curl at the end.





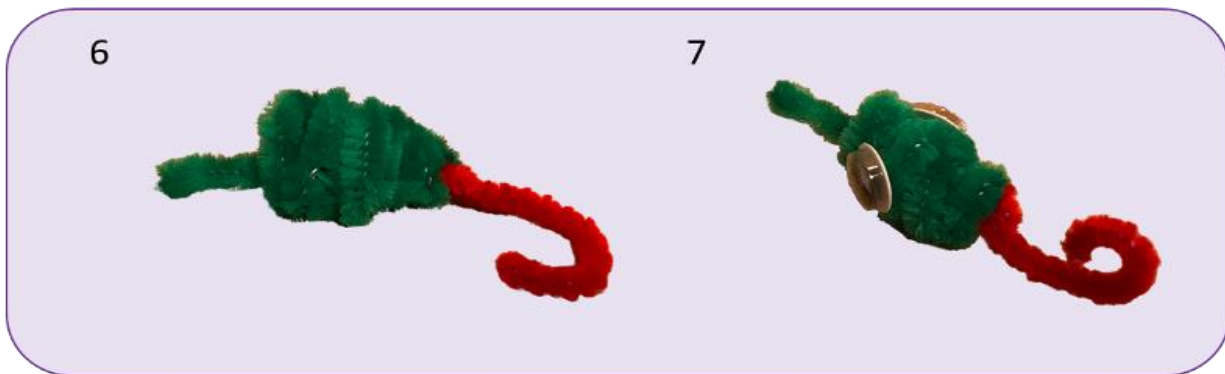
**3.** Help your kids bend the long section of the pipe cleaner downward so it crosses over the top of the shorter section as shown in **Step 3** above.

**Note:** Make sure that the area to the left of where the two sections crossed is long enough to insert into the chameleon's coiled body. This area is the chameleon's neck.

**4.** Next, your kids need to continue bending the long section of the pipe cleaner by going under the shorter section before heading back up behind the triangular outline of the head that was just formed. Your kids head should resemble the image in **Step 4** above.

**Note:** The exact length of the neck and the triangular outline of your kid's head will depend on what size head they'd like for their chameleon. A larger head will just need additional pipe cleaner to finish wrapping around the outline in **Step 5** below.

**5.** Help your kids bend the long section of the pipe cleaner over the top of the head, down and around to the back again, continuing in the same direction so their head resembles the one in **Step 5** above.



**6.** Once your kids have finished wrapping the pipe cleaner around the outline of the head, be sure they tuck the end under one of the loops they just made. Depending on the size of their chameleon's head, your kids may need another section of pipe cleaner, so the original outline of the head is completely covered as shown in **Step 6** above.

**7.** All that's left is to attach the googly eyes as shown in **Step 7** above. We prefer to use the Instant Tacky sticky dots, but you can use whatever adhesive you have around the house.