

How To: Make Orbit Balls

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These instructions show how to make “Orbit Balls” like those used in the 2009 FRC game Lunacy. The following steps focus on how to weave the strips into balls. Instructions on how to make cloth-covered polycarbonate strips like those in the actual Orbit Balls can be found at: <http://www.chiefdelphi.com/media/papers/2187>.

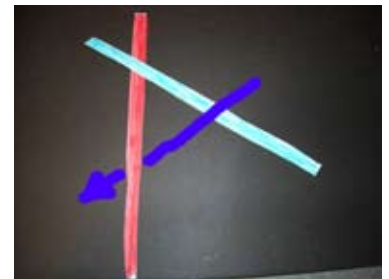
1. First, you will need six strips of whatever material you’re using for your ball. These instructions use a paper model, but the real Blip Toys Orbit Balls are made of plastic covered with fabric.



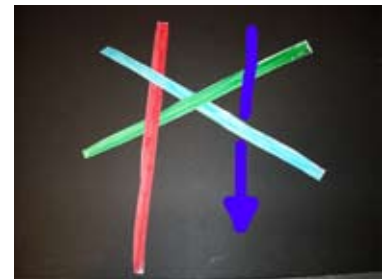
2. Assemble one of the strips into a circle. We’ve found that pop rivets work well for securing plastic materials, but tape or staples are adequate for paper. This circle will be the sphere’s “equator”.



3. Set the ring and three of the remaining strips aside. Put one of the two strips you’re working with over the other one, as shown in the picture. The Indigo arrow shows where the next strip is going to go. Over blue, under red, to begin the over-one-uder-one pattern that isn’t deviated from at any point in a correctly completed ball.



4. The picture shows the third (green) strip added in the correct place. The next strip will be inserted (following the purple arrow) in the same pattern, over-one-under-one.



5. The purple strip is inserted parallel to the red one and layered correctly. It can help to remember that all the intersections are triangles and all the holes are pentagons.



6. Now the orange strip is in. We can see 4 points of the “star”: orange under green, red under blue, green under purple, and blue under orange.



Be careful to keep the 4 points layered the way they are, without messing them up. In this step, gently shuffle the strips around so that hole in the center looks like a regular pentagon. Then make the fifth point of the star by layering red over purple.



7. Remember the star points from previous steps? Make sure that they don't come apart, because they want to. Some tape or clamps might help with the first few orbit balls you build. It helps to hold a full-size orbit ball so it's bent into a bowl shape at this point. An extra pair of hands can help at this point, holding the partial ball in your lap can help if extra hands are not available.

Each of the points of the star has one color that goes over and one color that goes under. Take each of those “under” strips (marked with a purple arrow) and hold them in a bunch in the center. Then put the ring you made in step 2 over that handful of strips, so that the ones you were holding are inside while the other ones are out of it.



8. The ring is on. If you get the following layering correctly, the ring will stay on. Each strip that just went through that equatorial ring now needs to go over one of the strips that went outside the ring.



9. Now connect one of the strips together to form a full circle. It doesn't matter which one, but for the purposes of these instructions we will use green. Make sure you are connecting the ends of the same strip.



10. The next band we are going to connect is the orange one. See how orange, is layered all, under-over-under, with green? If you did step eight right, that's how it should be.

Note: In theory it's okay to pick a random band to fasten second, but it makes it a lot easier in the long run if you choose one that the first strip you fastened crosses with in step eight. Purple would've worked just as well.



11. Now the blue strip should be going over/outside-of orange, under yellow/equator, and over red. The red strip (on the right hand side) should go over orange, under purple, over equator, and under blue. To keep with the over-under-over-under pattern, the red strip now needs to go over. Since green is the next strip in red's path, it's going to go over that. The other end of red went (look at the left-hand side of the picture) over blue, under equator, and over purple... so now it gets to go under orange.



12. Now we can fasten the two ends of the red strip together. If you have done the layering correctly, all the connected strips should follow the over-under-over-under pattern all the way around the ball.



The end of the blue strip that just went under orange now needs to also go under green. This seems to break the pattern, but remember that we need something for purple to go under after it goes over green.



13. Blue is fastened together. Purple now goes over green, under blue, over orange, and fastens together.



14. Done. Now every strip in the ball should be going around in the over-under-over-under-over pattern to eternity.

