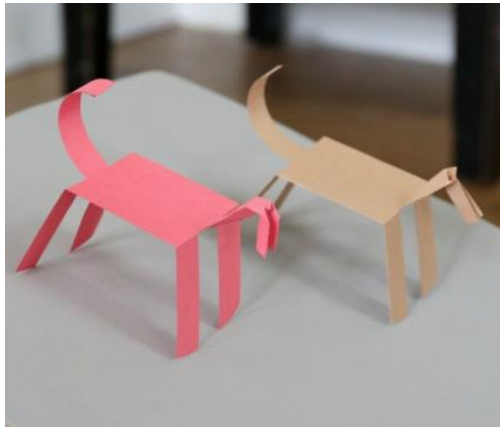
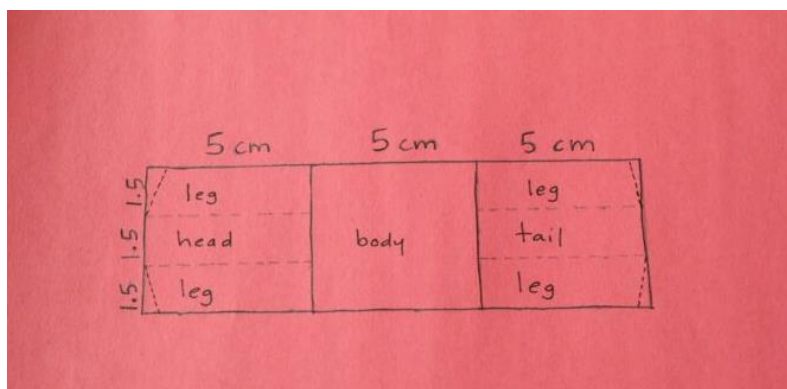


## Make a Paper Horse that Walks

I tried this with Caspar and we had to do it twice because you have to be perfect with how much you trim off and how precise your folds are. But once we did it, it was super exciting to see the horse made out of paper walk. Totally amazing!



Use a metric ruler to draw the shape below. Start with a rectangle that is 15 cm by 4.5 cm. Then divide it up as shown. Cut around the perimeter of the rectangle. Then cut the DOTTED LINES inside the rectangle.



You don't need to do this, but you can label the legs, head, body and tail.

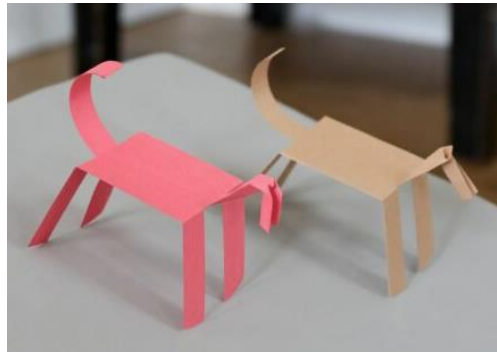
Cut out horse as shown below:



Here is a close up of the feet – they are important



Curl the tail (I know horses tails aren't curled like that, but it seems to make it balance better) and fold the head.



**NOW, make your horse walk!!!**

So, did I tell you there is physics in this process? Well, yes there is and this is how it works:

The paper horse walks by rocking back and forth on its curved feet. As the horse rocks from one foot to the other, gravity pulls the feet down the incline.

So it rocks to the right, and the left foot (which is no longer touching the board) moves forward. It rocks to the left, and the right foot moves forward.

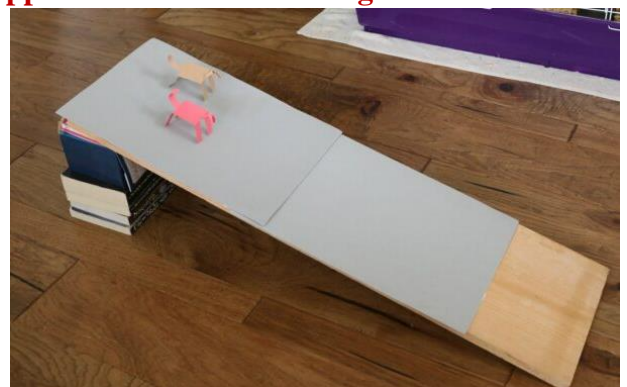
**The surface that the horse walks on is important! It needs to have enough friction, but not too much.**

**Try different surfaces like a large picture book. What happens the horse? Does height effect how the horse travels?**

**Now, try putting a piece of felt on top of the book. What happens? This should increase the friction, and the horse should move a little. However, there is probably too much friction.**

**So, try a sheet of card (not paper) what happens now?**

**You can see our setup below. Your ramp doesn't need to be this long! A shorter ramp will still allow the horse to do plenty of walking.**



**TIPS to HELP YOU:**

- If you can't get your horse to walk, make sure that the legs are nice and straight.
- Try adjusting the height of the head. For whatever reason, our horse walked the best when his head was up high.
- Adjust the height of your slope. If the horse won't walk, make it higher. If the horse tips forward, make it lower.
- If your horse is not rocking back and forth smoothly, try trimming the feet to make them rounded. They should work like rocking chair runners! The outside edge should be the highest point.