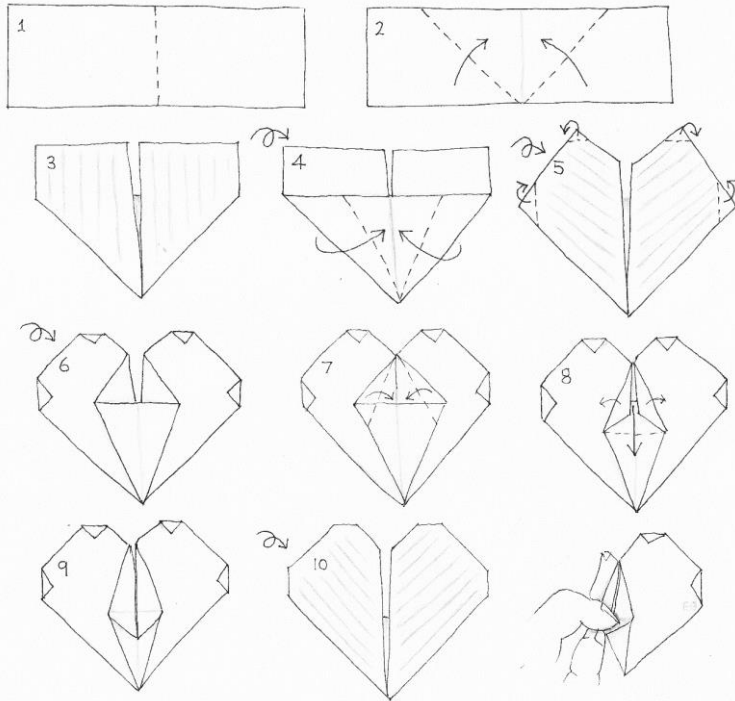




Beating heart



To make your own beating heart fold along the line of the drawing of heart cells to the right and tear or cut off the strip. The diagram above shows how to fold the drawings into an origami heart that can be made to beat and make a sound through gripping the back with your fingers. Start folding with step 1 with the back of the drawing. If you find diagrams hard to follow then take a look at [The Royal College of Pathologists' YouTube channel](#) for 'Beating heart' for a demonstration for folding. Share photos or videos of your beating heart through social media #ArtOfHeart.

Your heart pumps blood around your body to keep you alive and well. This remarkable part of your body is made of muscle cells that beat. A continuous flow of blood is needed to keep your body working. At rest, your heart beats around 70 times a minute. The drawing on the right shows how the heart looks under the microscope. Use it as the strip of paper for folding your own beating heart. Colour in the drawing before you fold your heart.

Section A of the drawing shows the microscopic appearance of healthy cells (cardiac muscle) that are responsible for your heart beating. Colour in these muscle cells and notice their long fibres and round nuclei where your DNA is found. The line in the white space between the two sides of the drawing represents a scale (100 micrometres) which is around the width of a human hair. The muscle cells in your heart are large compared to other cells so they can perform their task of beating over three billion times in an average lifetime.

Sections B, C and D of the drawing show how heart cells can change through disease, with three different examples. **Section B** shows how heart cells look when a pathologist diagnoses a heart attack – the cells have been damaged and died, their nuclei are missing and some tiny red blood cells can be seen. **Section C** shows muscle cells being attacked by white blood cells through a rare auto-immune disease (myocarditis) which weakens the heart. **Section D** shows cells from someone with a genetic disease (hypertrophic cardiomyopathy) where muscle cells grow at unusual angles and so cannot work well together for pumping blood. Cardiologists and cardiothoracic surgeons specialise in the heart. Pathologists work with these specialists to help patients with heart problems like those shown. Add colour to the cells as a pathologist would when looking at a specimen under a microscope, then fold a healthy beating heart.

Pathologists include doctors and scientists who study and help diagnose disease and work in 17 different specialties. Read more about pathology: www.rcpath.org/discover-pathology. Drawings and writing: science-based artist, Dr Lizzie Burns in collaboration with pathologist Dr Esther Youd. 'Beating heart' Origami designed by David Petty with thanks for permission from the British Origami Society. ©Dr Lizzie Burns 2020

