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— We have developed a powerful new approach to working with graphene by applying the principles of kirigami, the sculptural art of paper cutting. We have release graphene from the surface, allowing us to treat it like a sheet of atom-thick paper. Working in water, we can pull the graphene along the surface or peel it up entirely. Combining this technique with lithographic patterning, we have created a variety of graphene kirigami devices including three-dimensional structures and resilient, atomically-thin hinges. We have also created soft in-plane springs by patterning a series of cuts into the graphene. The spring constants of these devices depend on the pattern of cuts, so the patterned graphene becomes an adjustable mechanical metamaterial. With possible spring constants ranging from 1 N/m to 10^{-9} N/m, these springs could be used as sensitive force measurement devices. Such kirigami patterning techniques could also be applied to flexible and stretchable electronics, including soft electrodes for biological experiments. This unusual way of interacting with graphene opens up a world of potential applications that we are just beginning to explore.

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