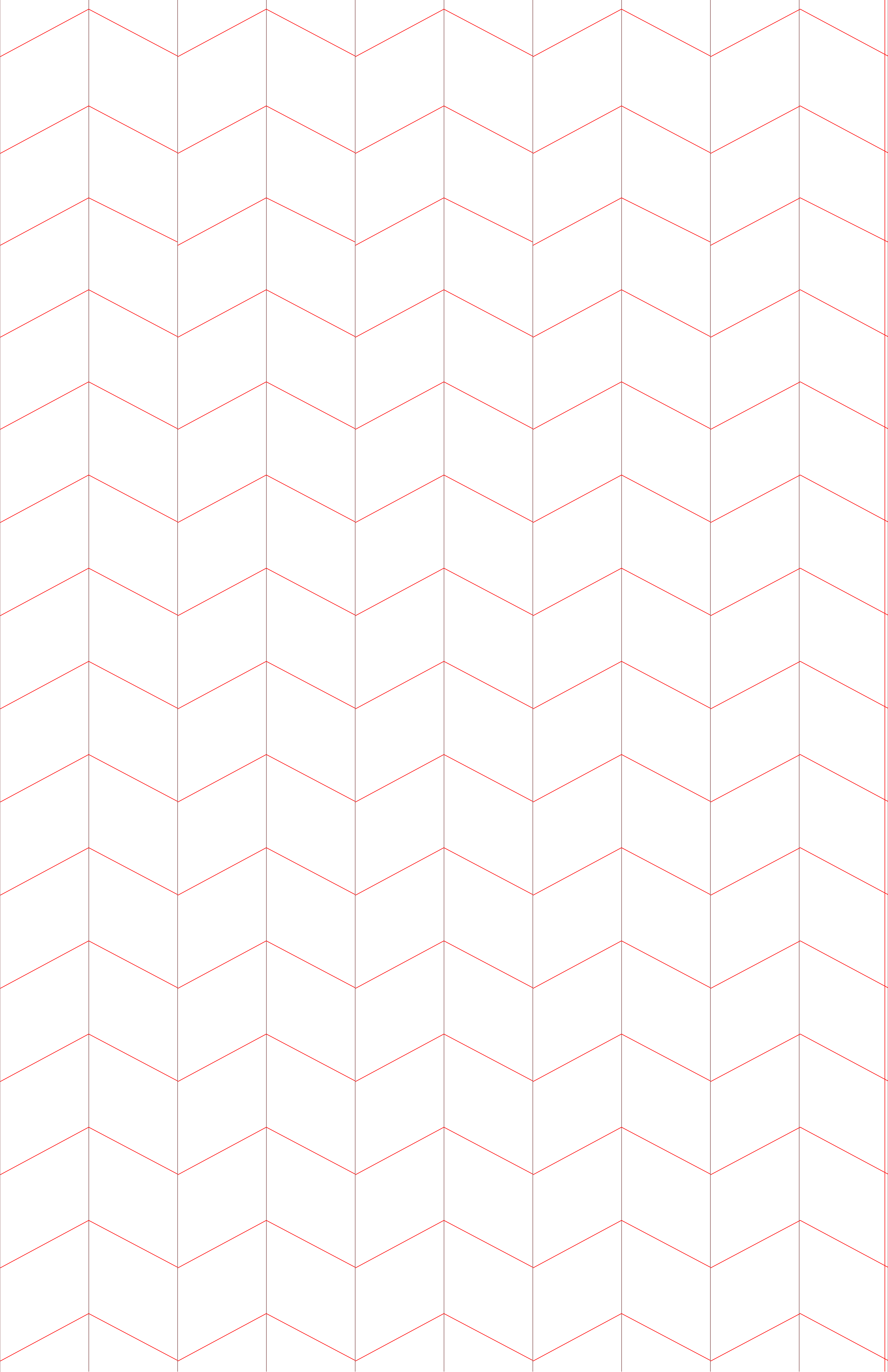
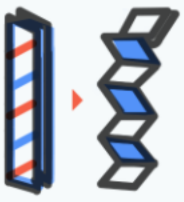


While most natural materials expand and compress in only the direction in which they are stretched (either L/R or up/down), auxetic metamaterials respond to push and pull in unexpected ways. The most iconic auxetic structure is the Miura-ori fold pattern, which casuses the paper to stretch up/down when pulled L/R (and vice-versa.) This behavior indicates a “negative Poisson’s ratio”—a measure of reactive directional stretchiness and the defining characteristic of auxetics. When complete, your paper will have tension like a spring—with each modular unit pulling in unison. You can stiffen parts of your sheet by introducing defects (by inverting any given mountain or valley), which prevents compressibility in those selected zones. This principle is currently being used on a nano-tech level to “program” the flexibility of shells/skin.

1

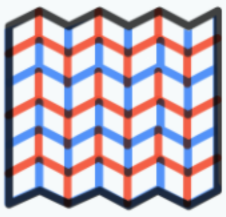
“Accordion” the sheet lengthwise first.

2



Fold the accordion stack along eac diagonal (Don’t worry about mountains and valleys yet).

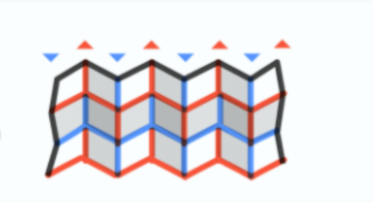
3



Fold the crease pattern in the direction indicated below.

🟥 mountain
🟦 valley

4



Begin popping the mountains + valleys into their final formation along the top edge. Work down the sheet to the bottom.