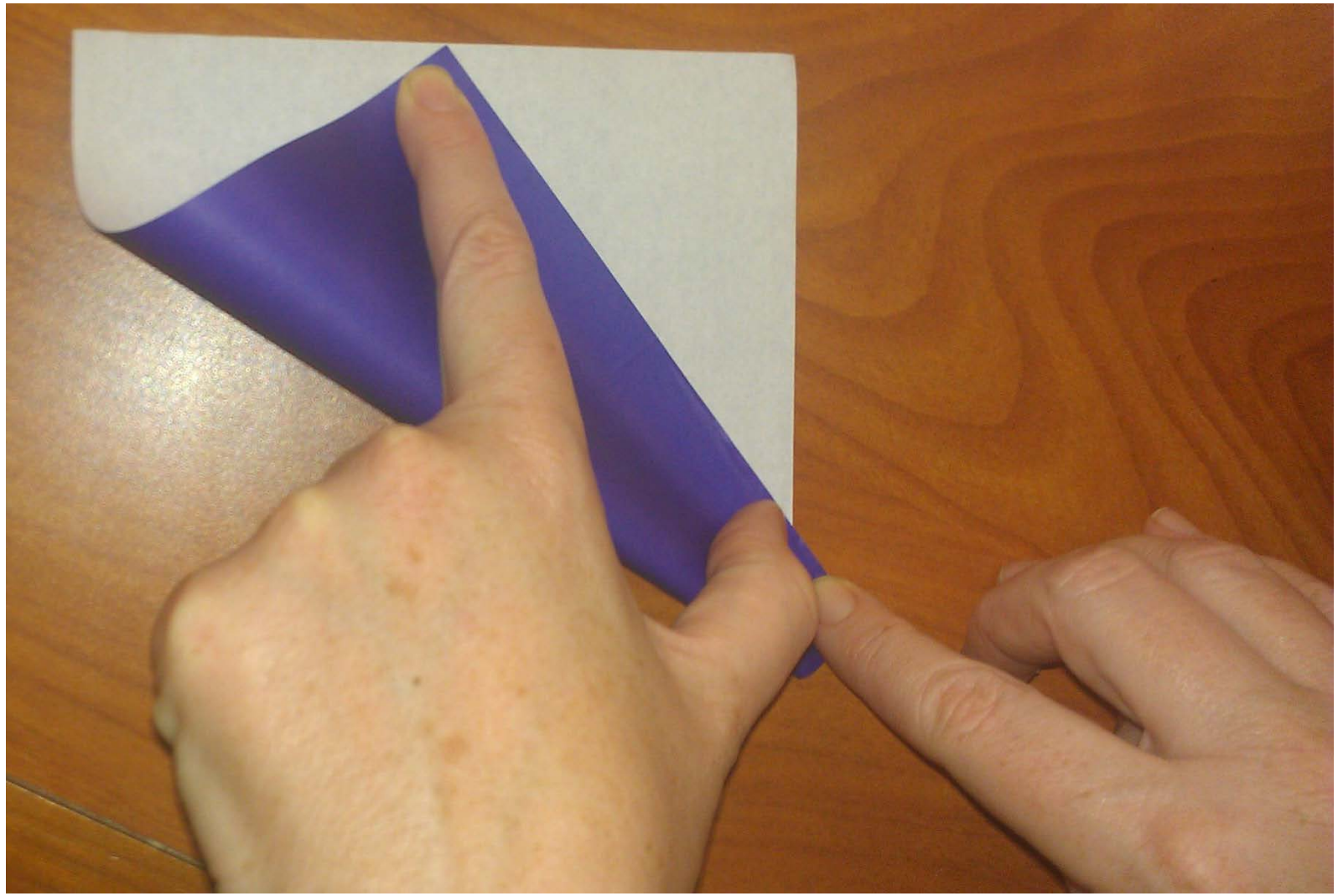
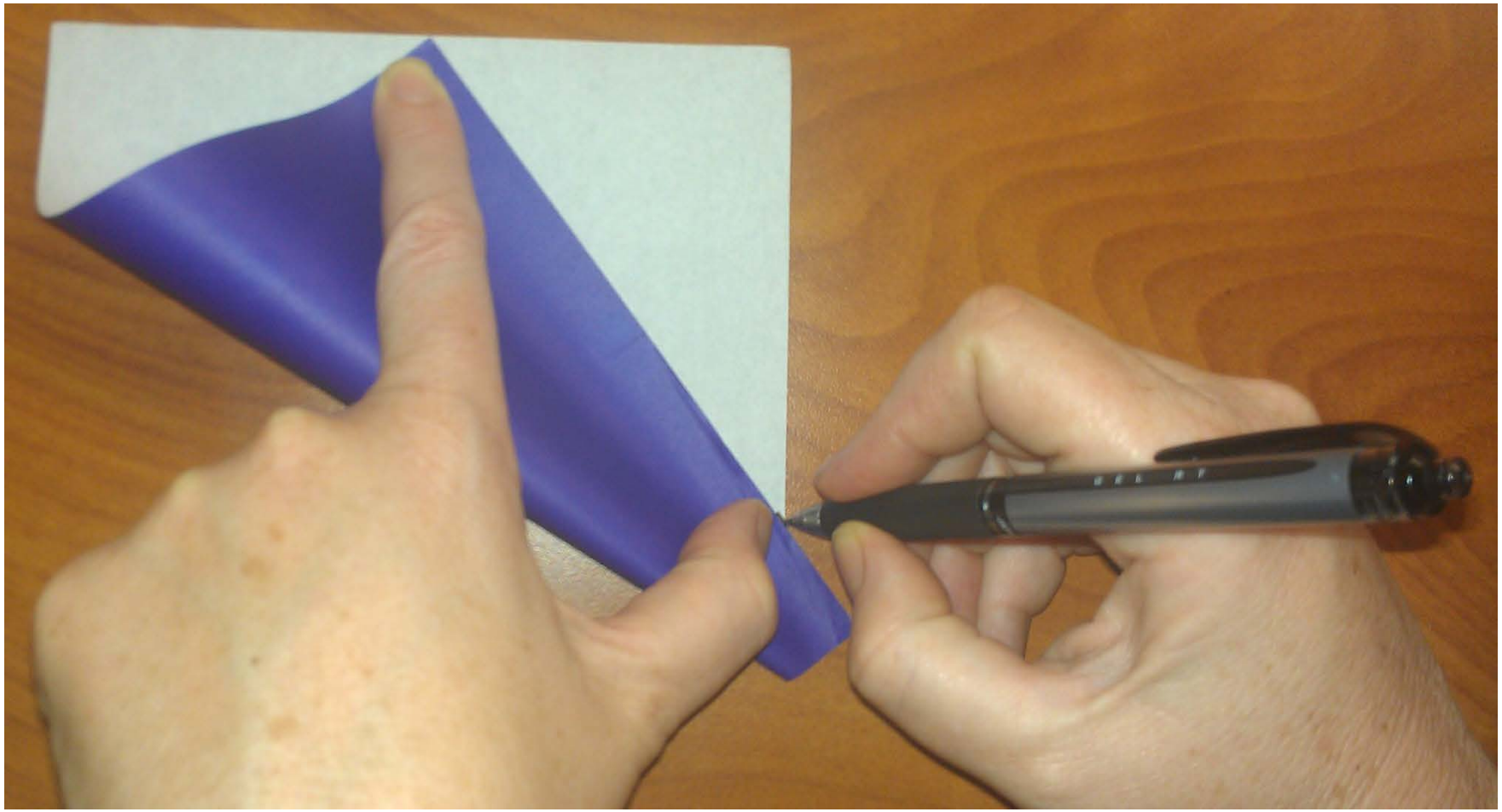
University of San Diego
Inspiring Algebra Explorations
through Paper Folding
mathigami

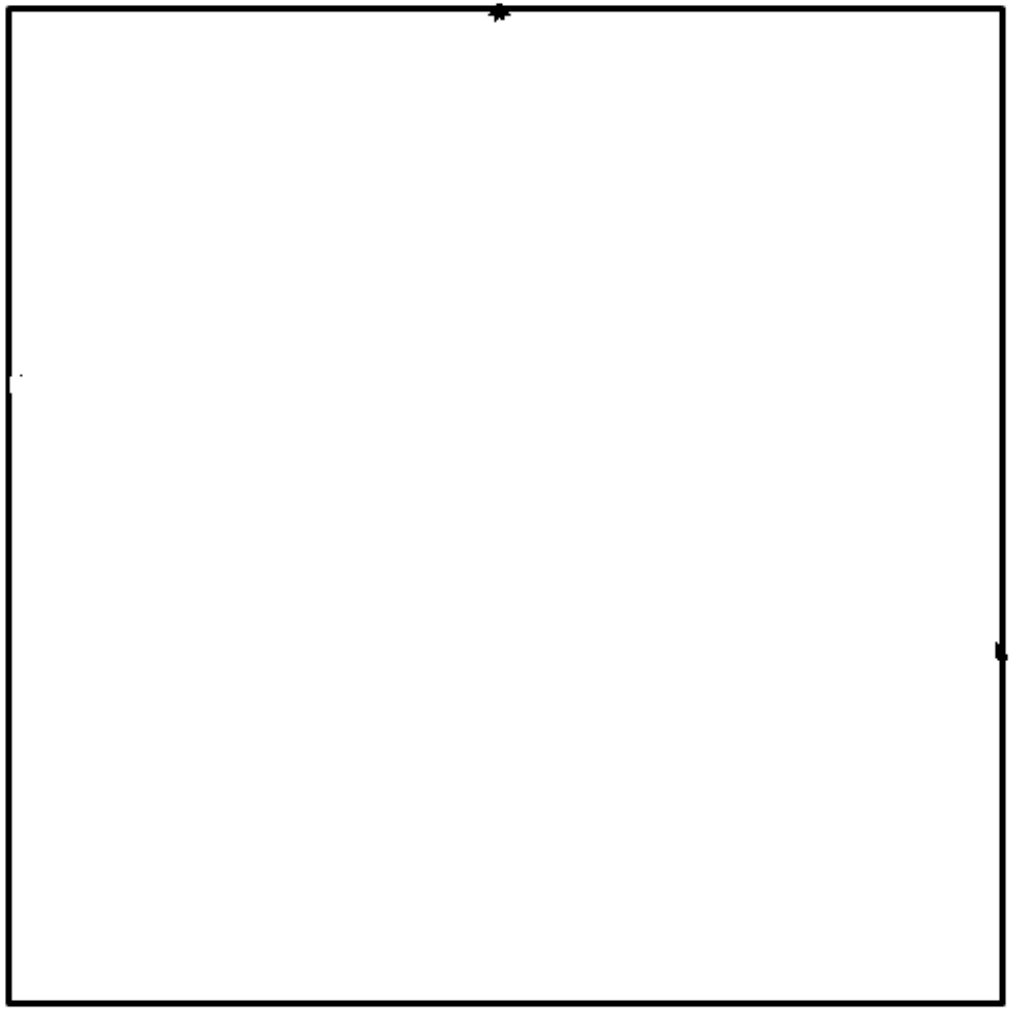
Purpose of the session

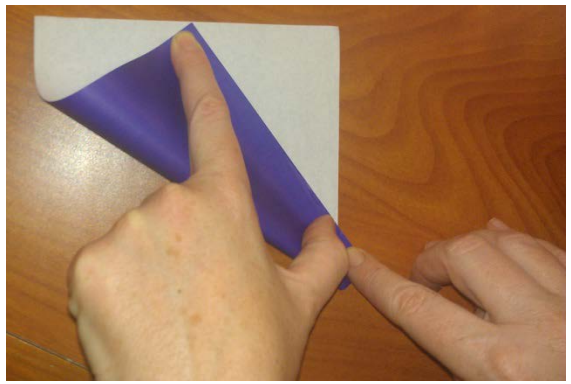
In this session we will share some mathematical explorations that can arise from experimenting with paper-folding and asking questions. These mathematical explorations, in turn, may lead to the creation of new paper-folding models.

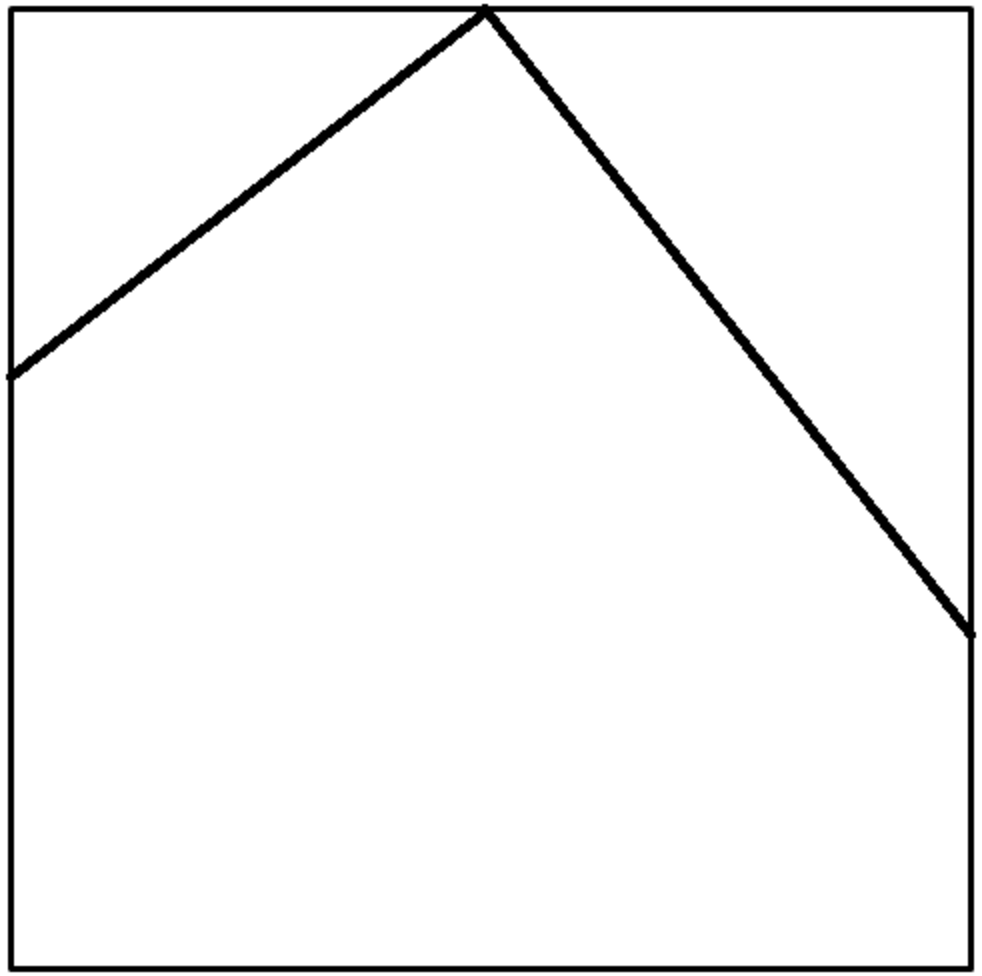




Write some questions, observations and conjectures







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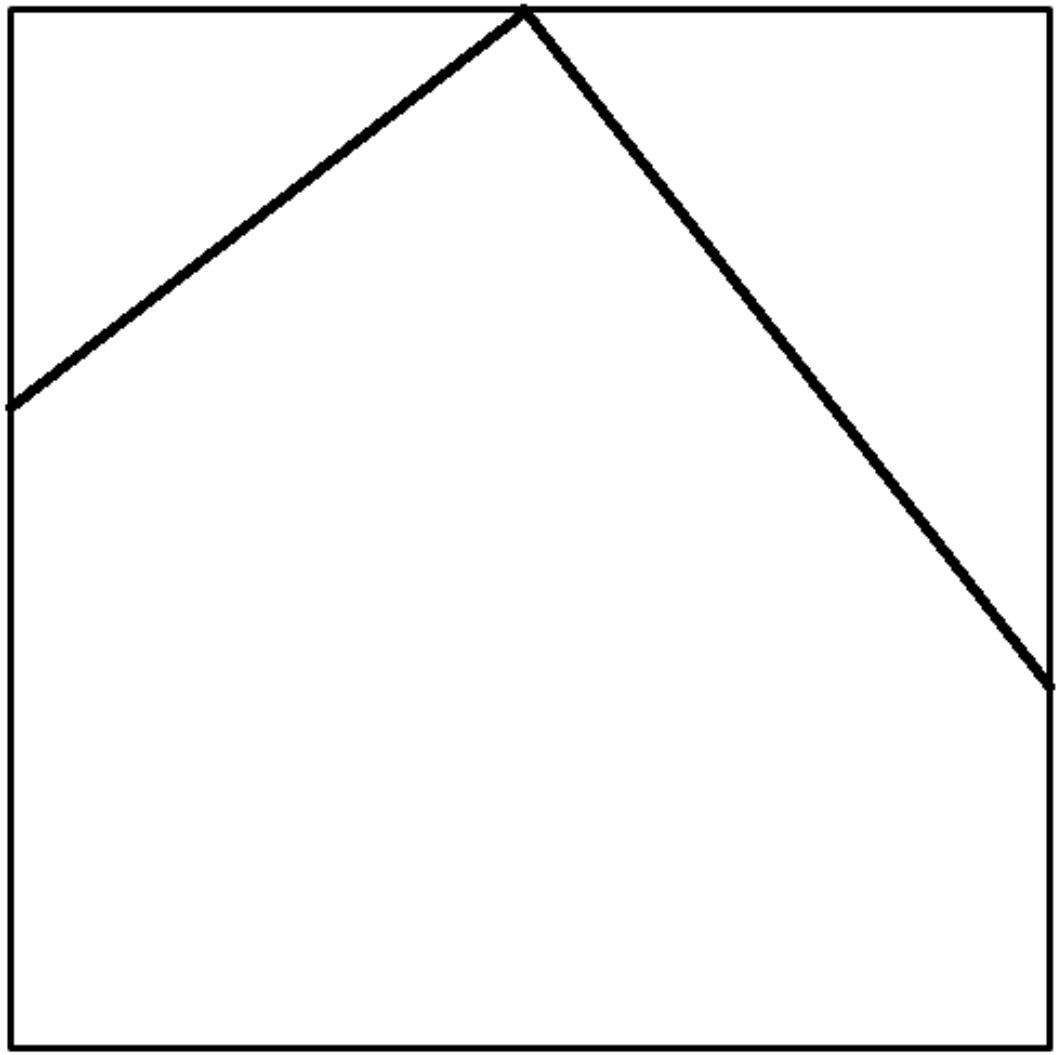
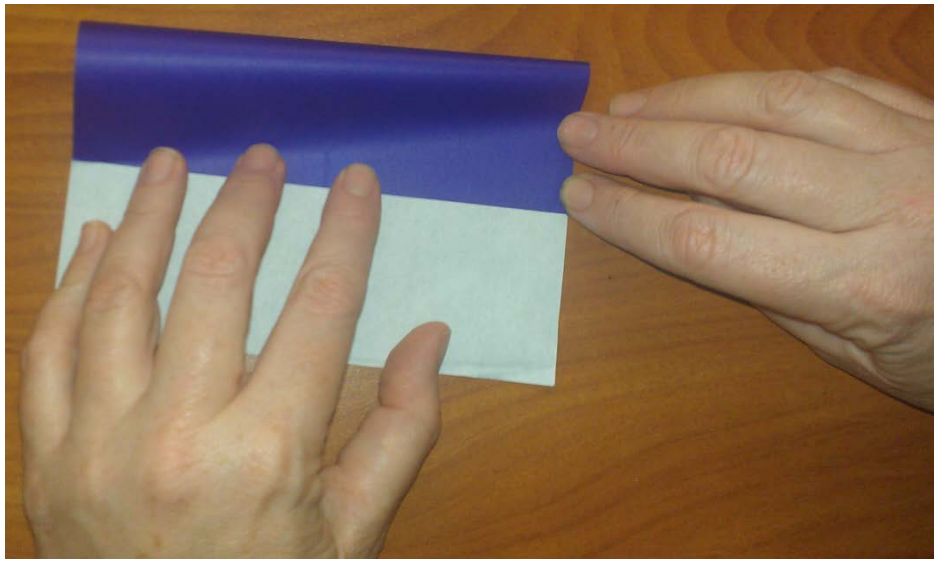
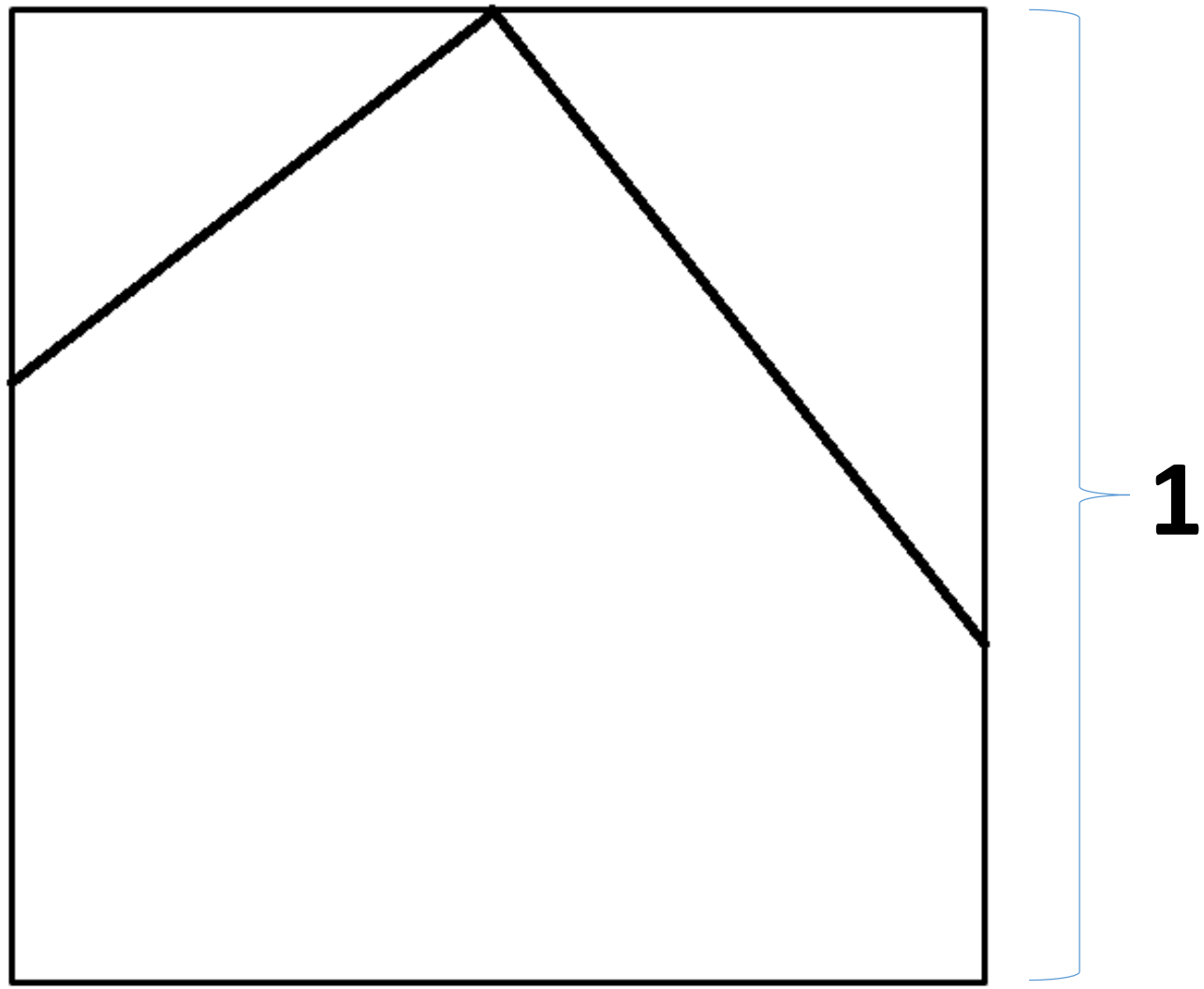


Why does this process result in one third of the distance from the bottom of the page to the top?

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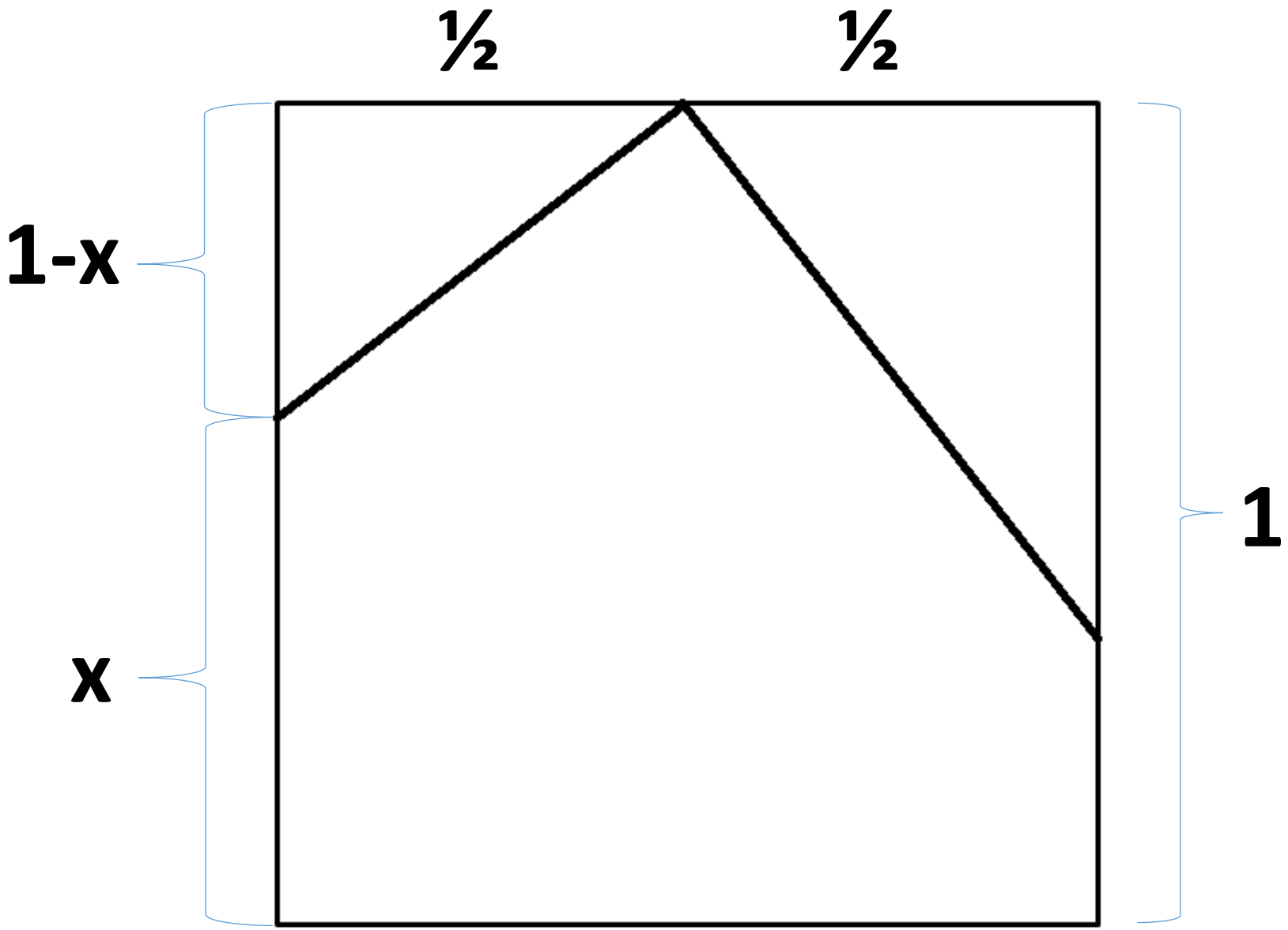
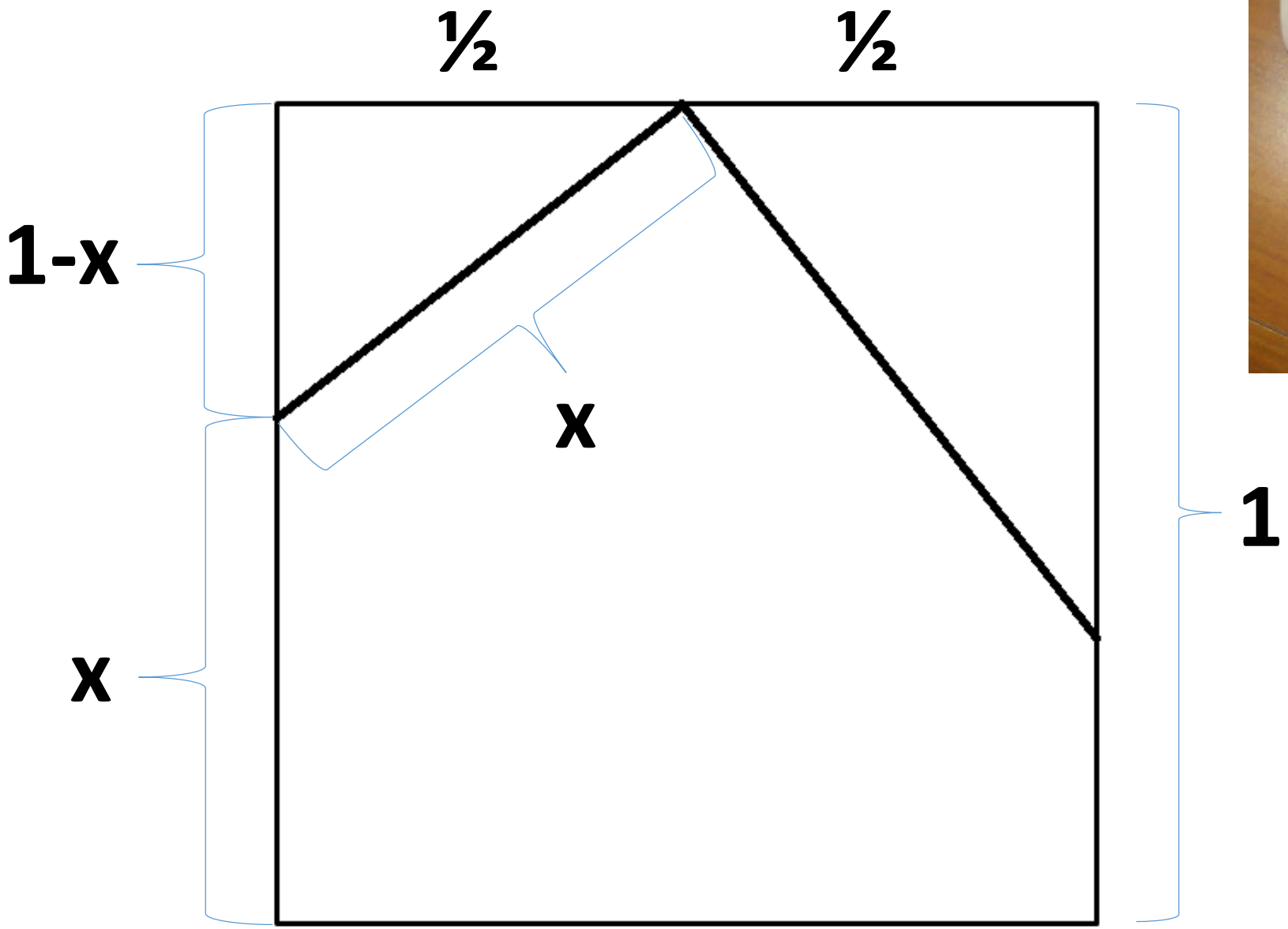
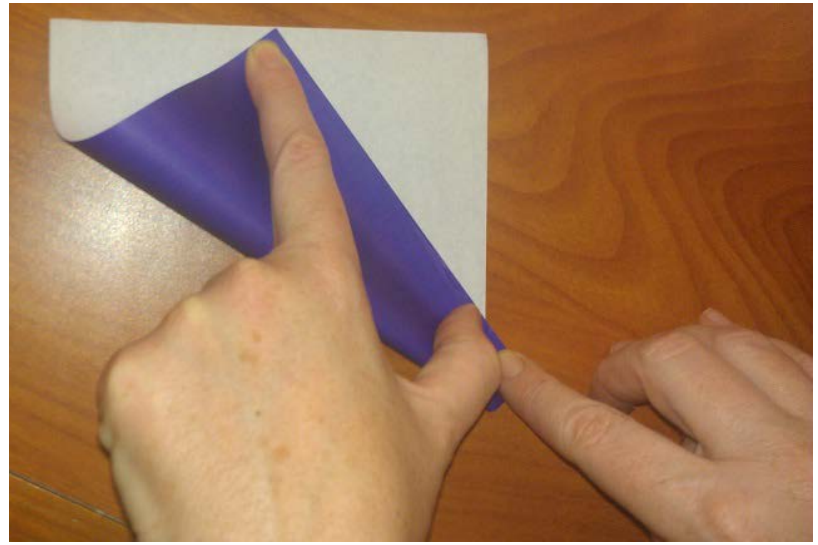
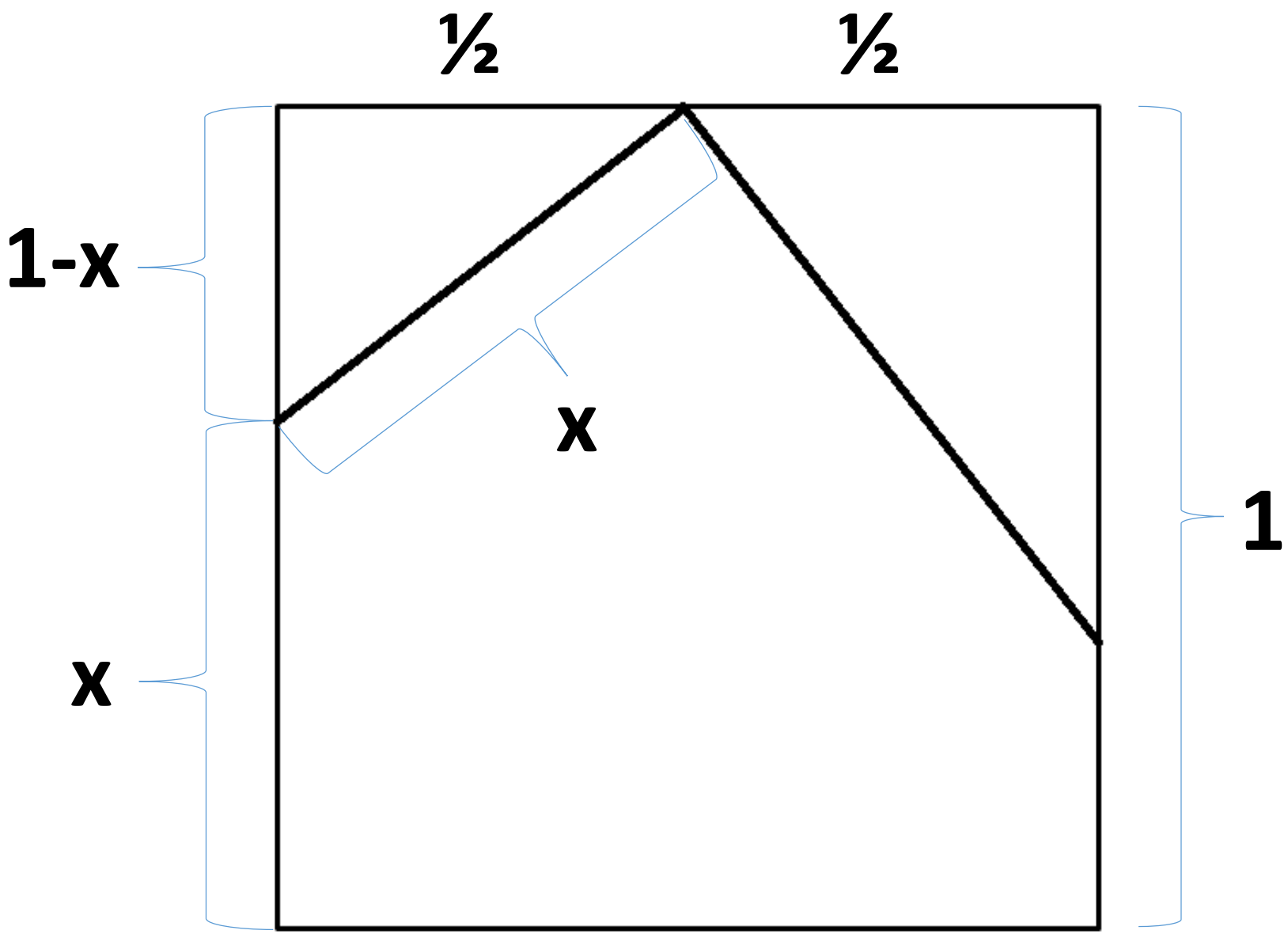

½
½
1-x
x
1


½
½
1-x
x
x
1





$$(1-x)^2+\left(\frac{1}{2}\right)^2=x^2$$

$$1-2x+x^2+\frac{1}{4}=x^2$$

$$1-2x+x^2+\frac{1}{4}=x^2$$

$$-x^2 \qquad -x^2$$

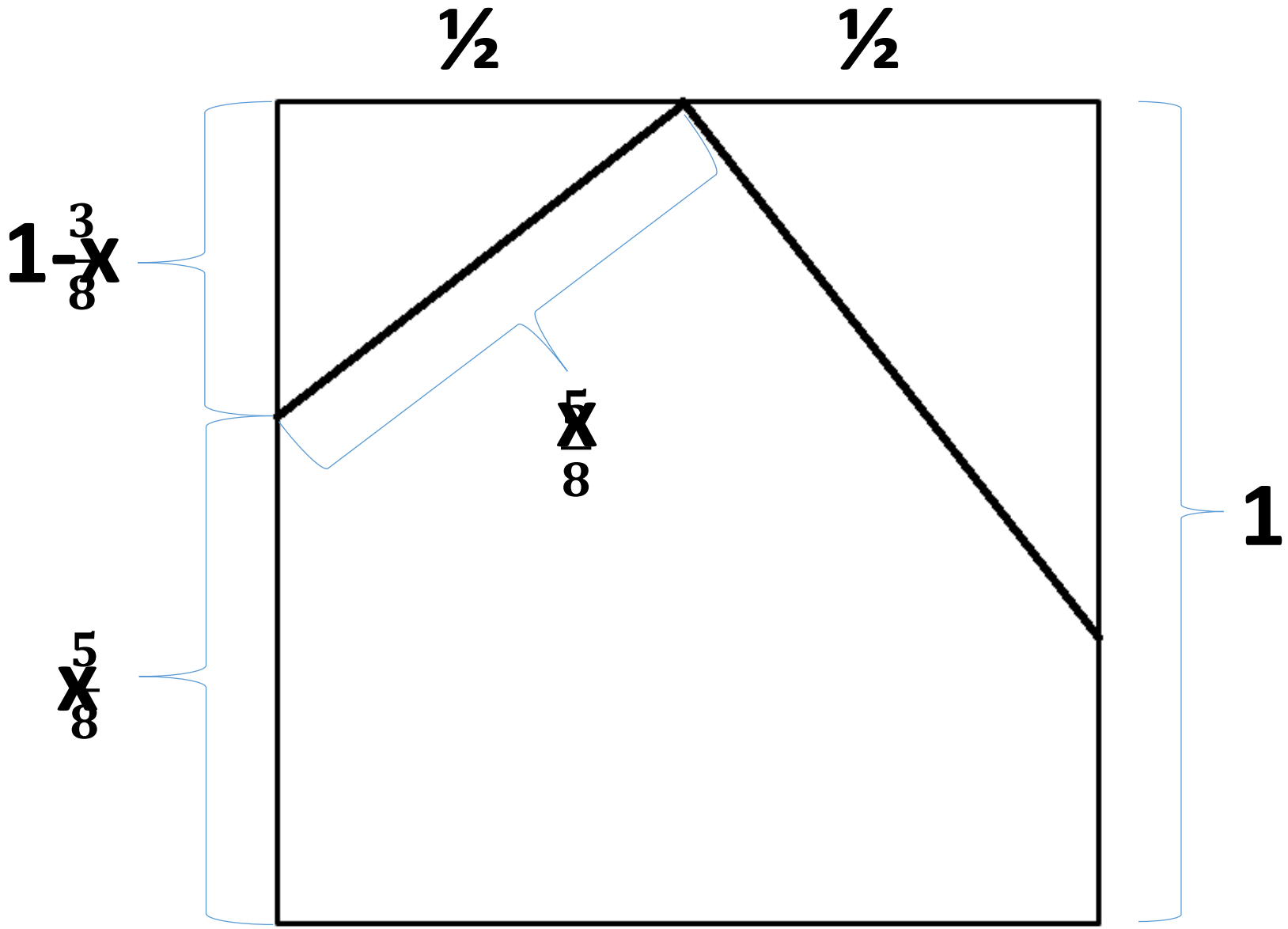
$$1-2x+\frac{1}{4}=0$$

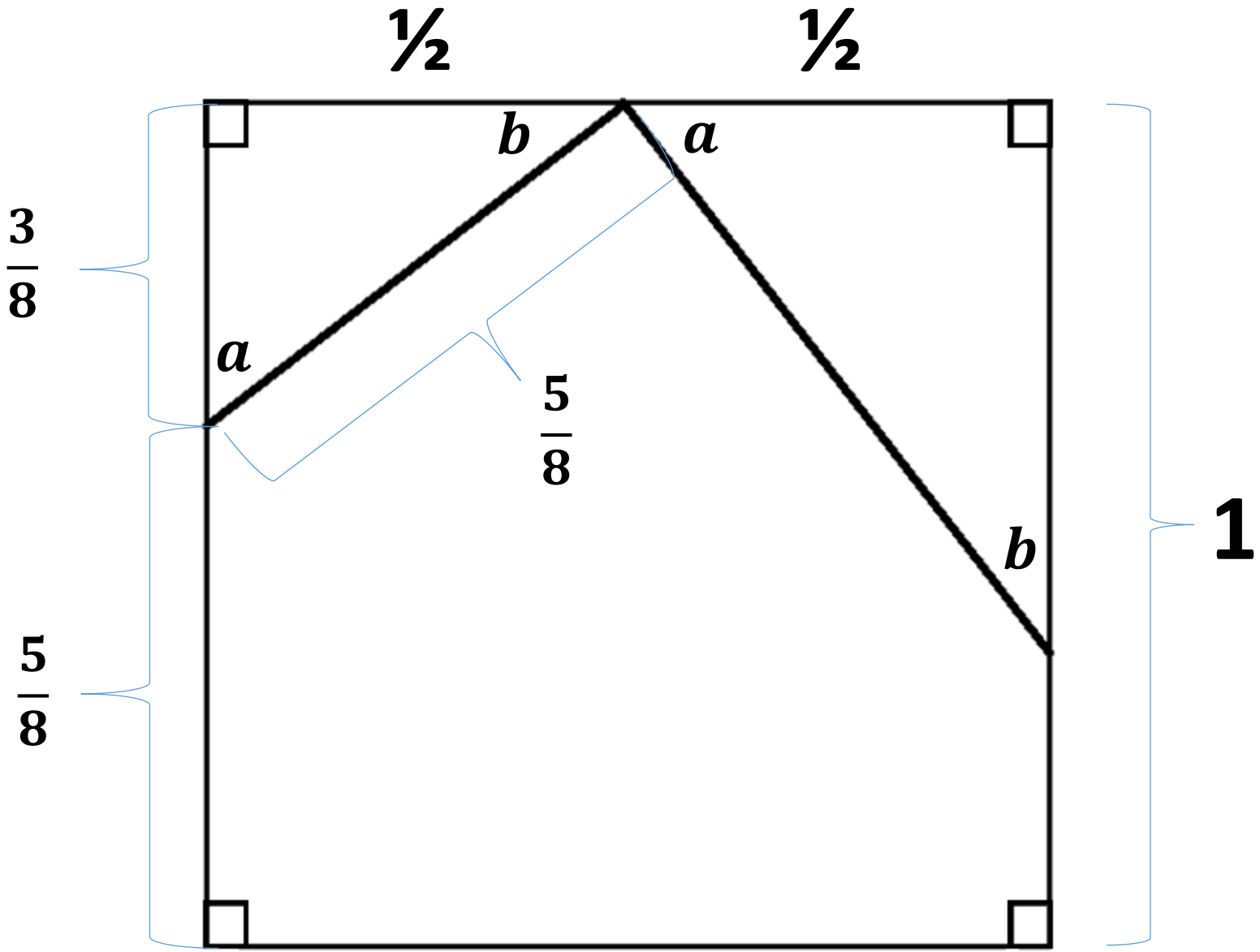
$$+2x \qquad +2x$$

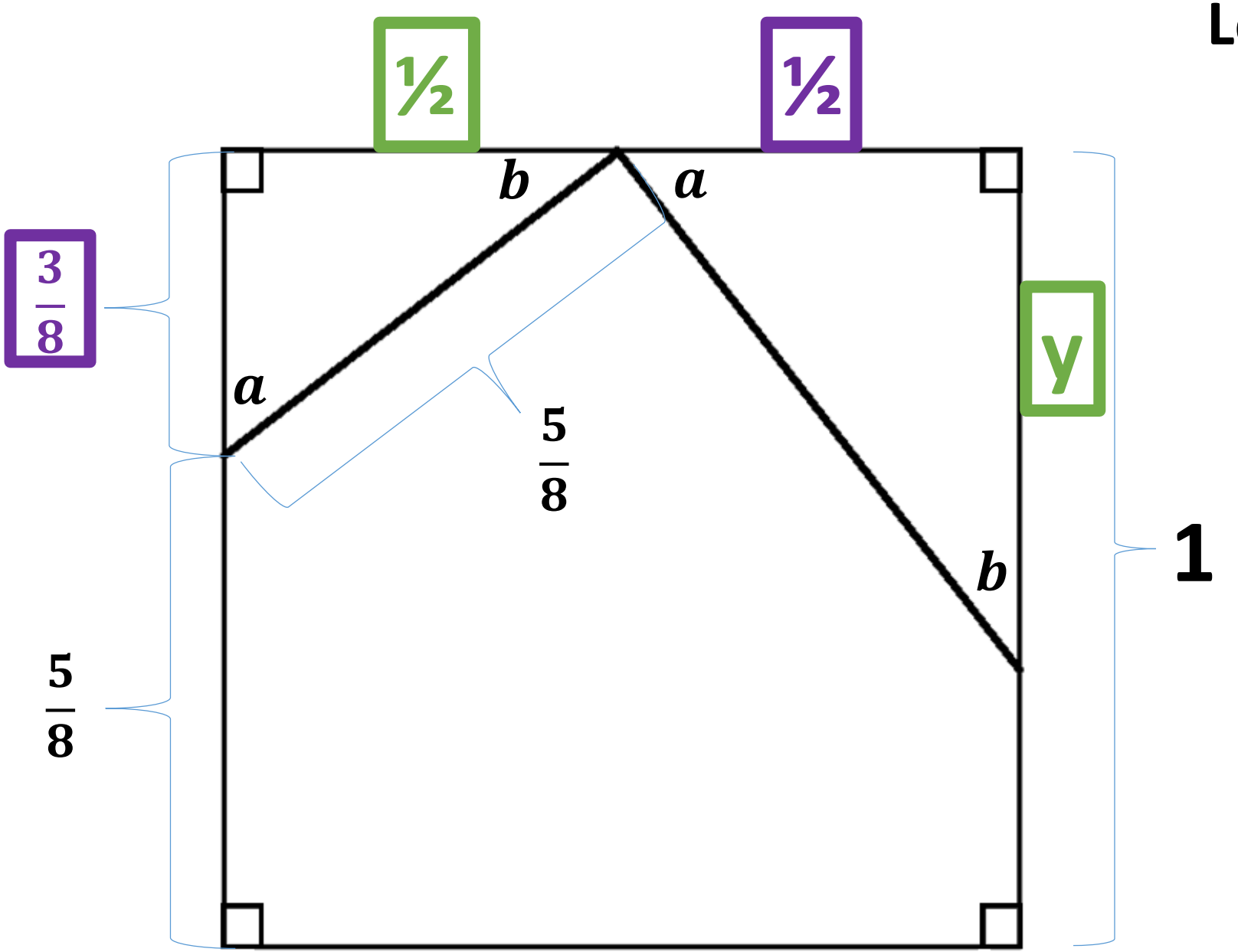
$$\frac{5}{4}=2x$$

$$x=\frac{5}{8}$$

$$x = \frac{5}{8}$$




½
½
b
a
3/8
a
5/8
b
5/8
1



Let *s* be the scaling factor

$$\frac{3}{8}s = \frac{1}{2}$$

$$s = \frac{1}{2} \cdot \frac{8}{3}$$

$$s = \frac{4}{3}$$

$$\frac{1}{2}s = y$$

$$\frac{1}{2} \cdot \frac{4}{3} = y$$

$$y = \frac{2}{3}$$

What mathematical concepts are involved?

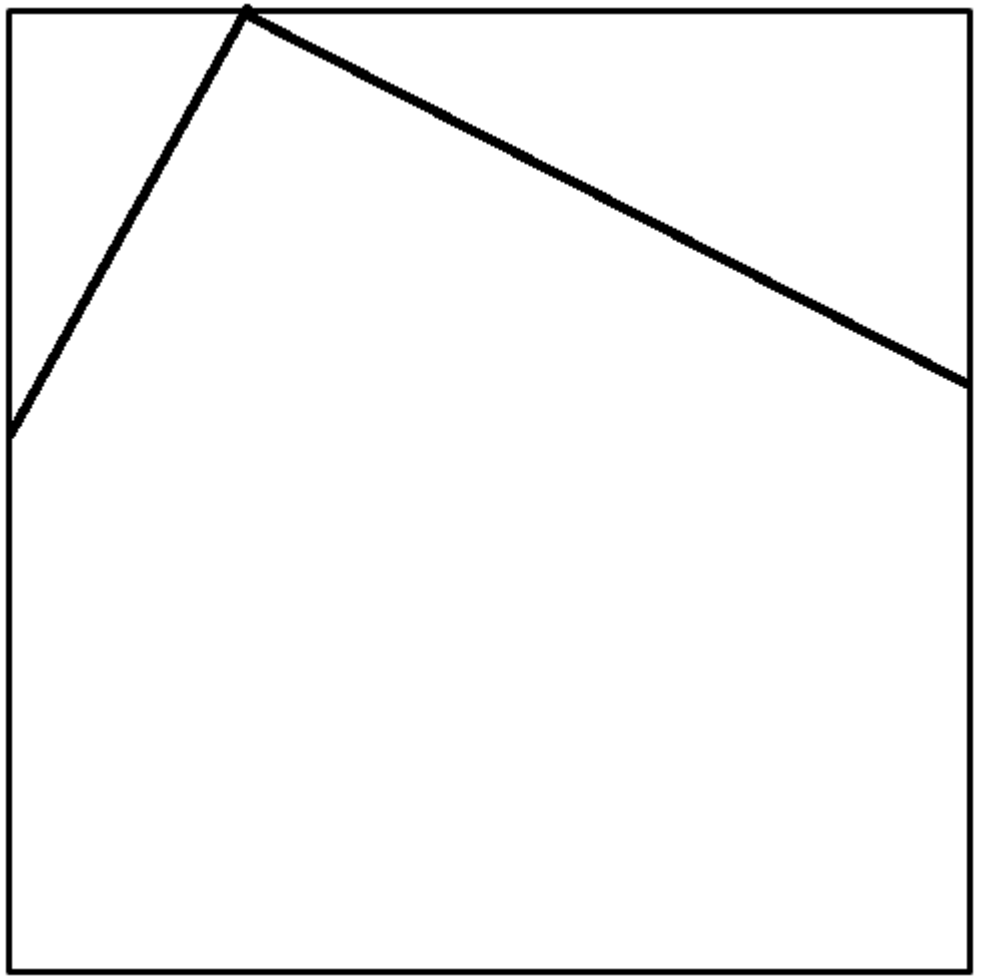
What other exploration questions can we ask?

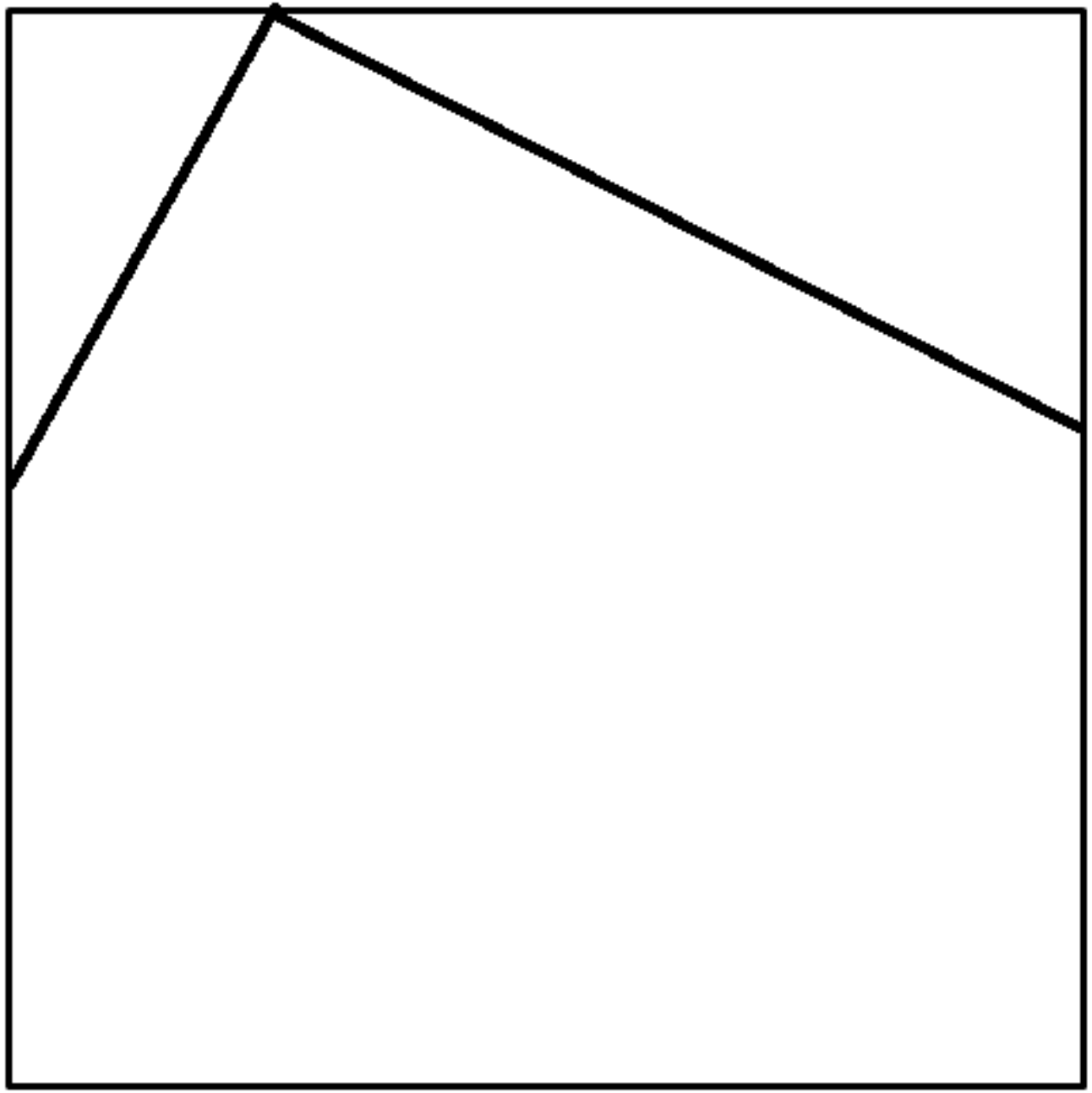
What Mathematical Practices are involved?

Standards for Mathematical Practice

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.

What about a different fraction?

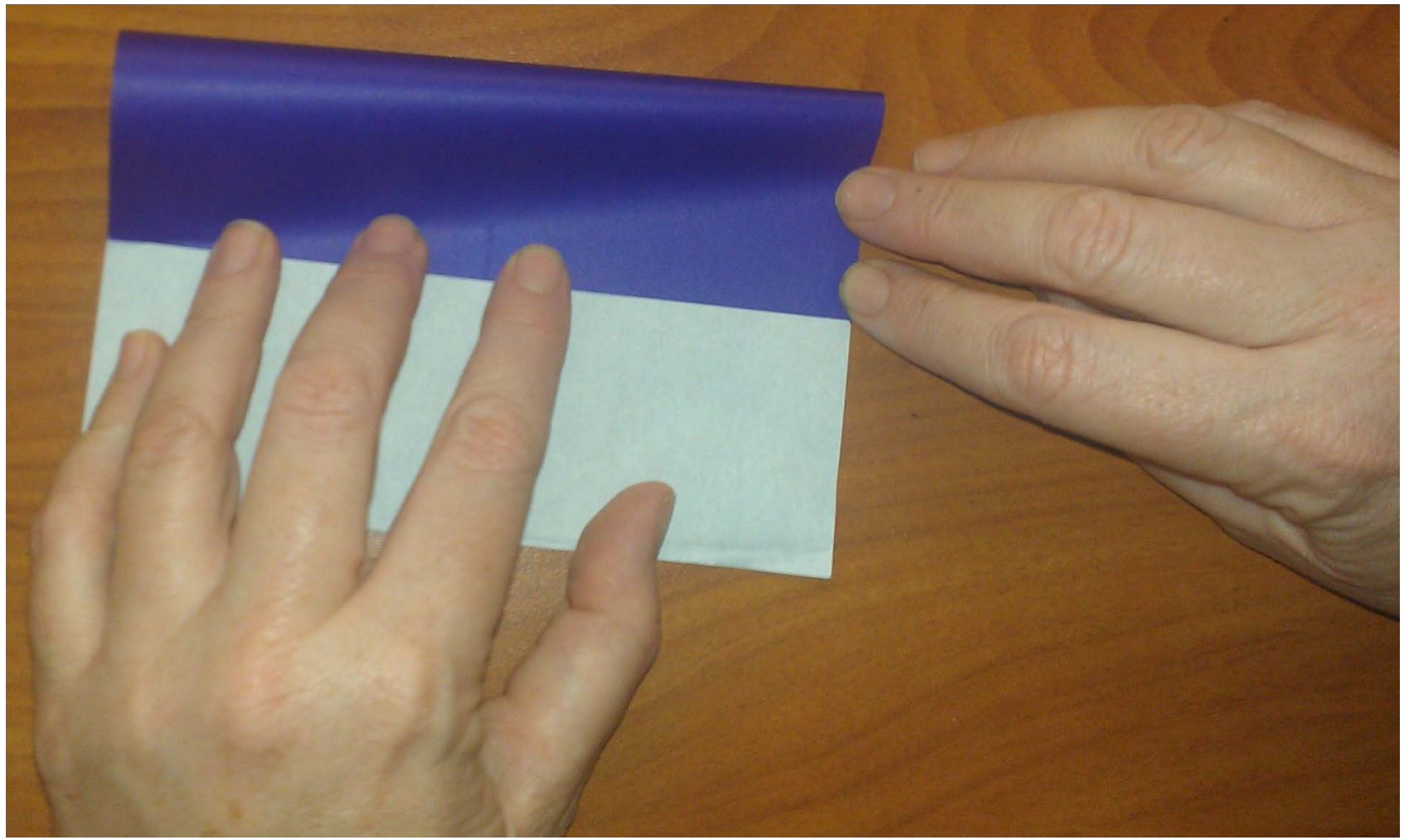


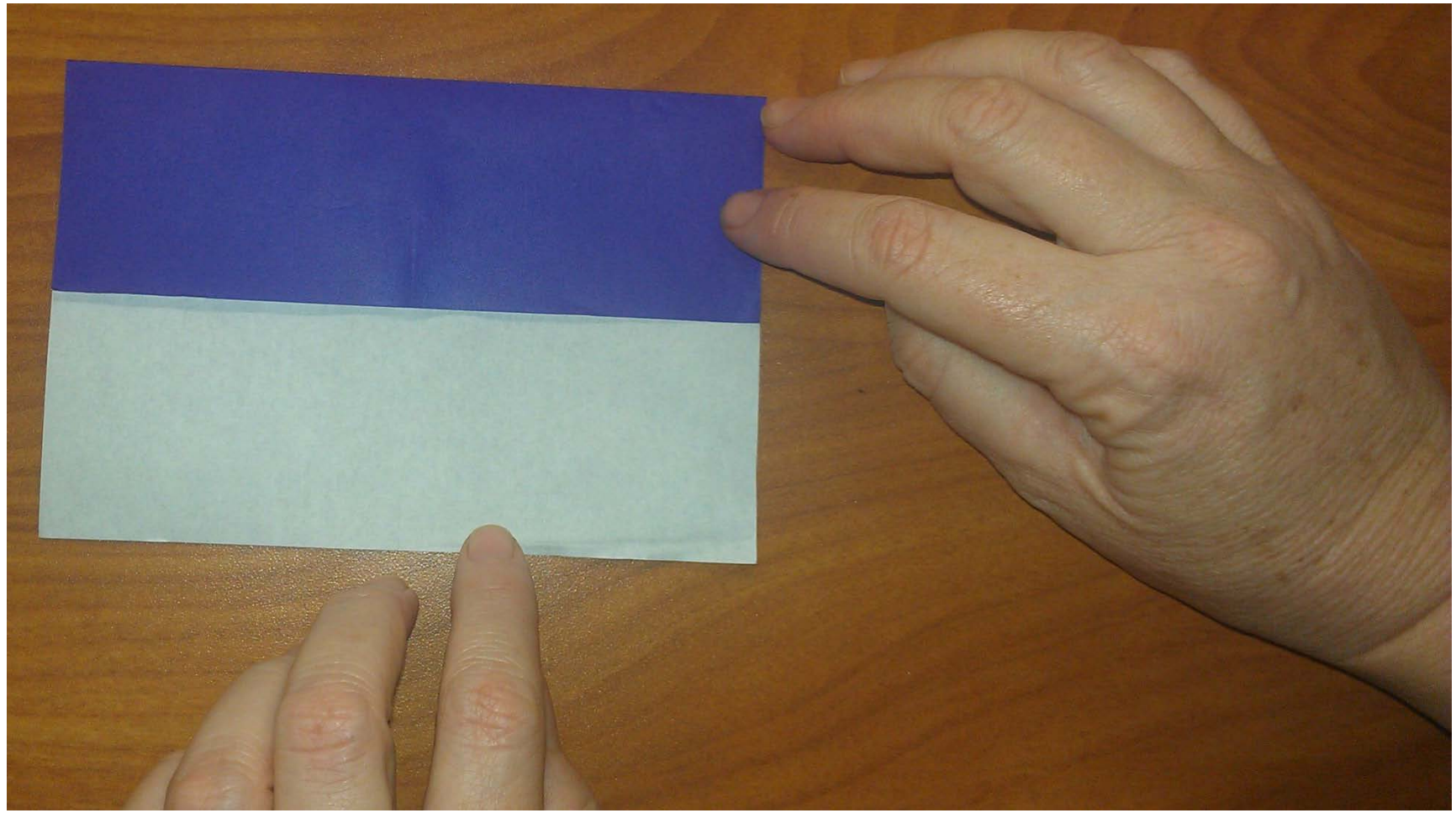


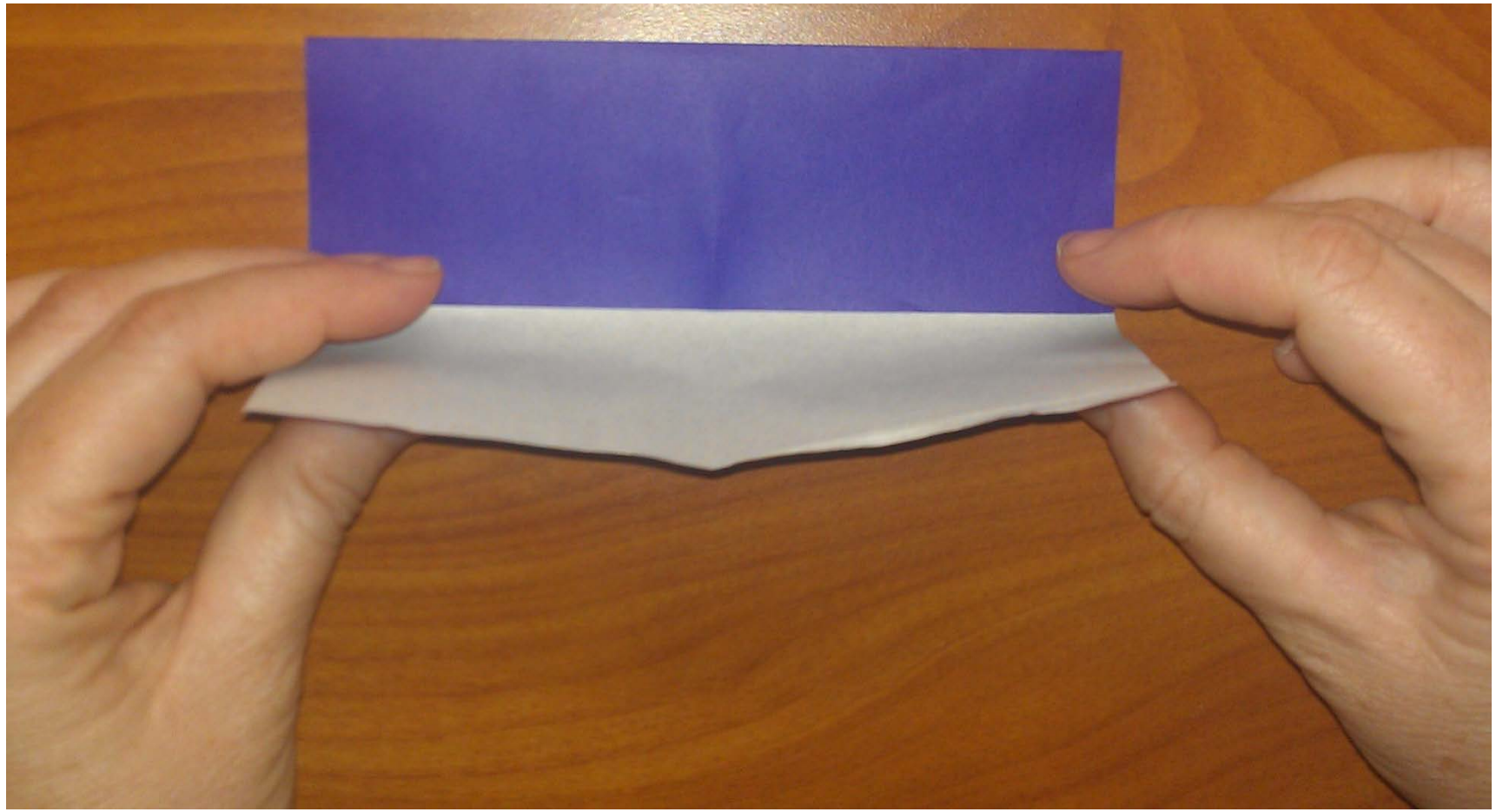
Our focus:

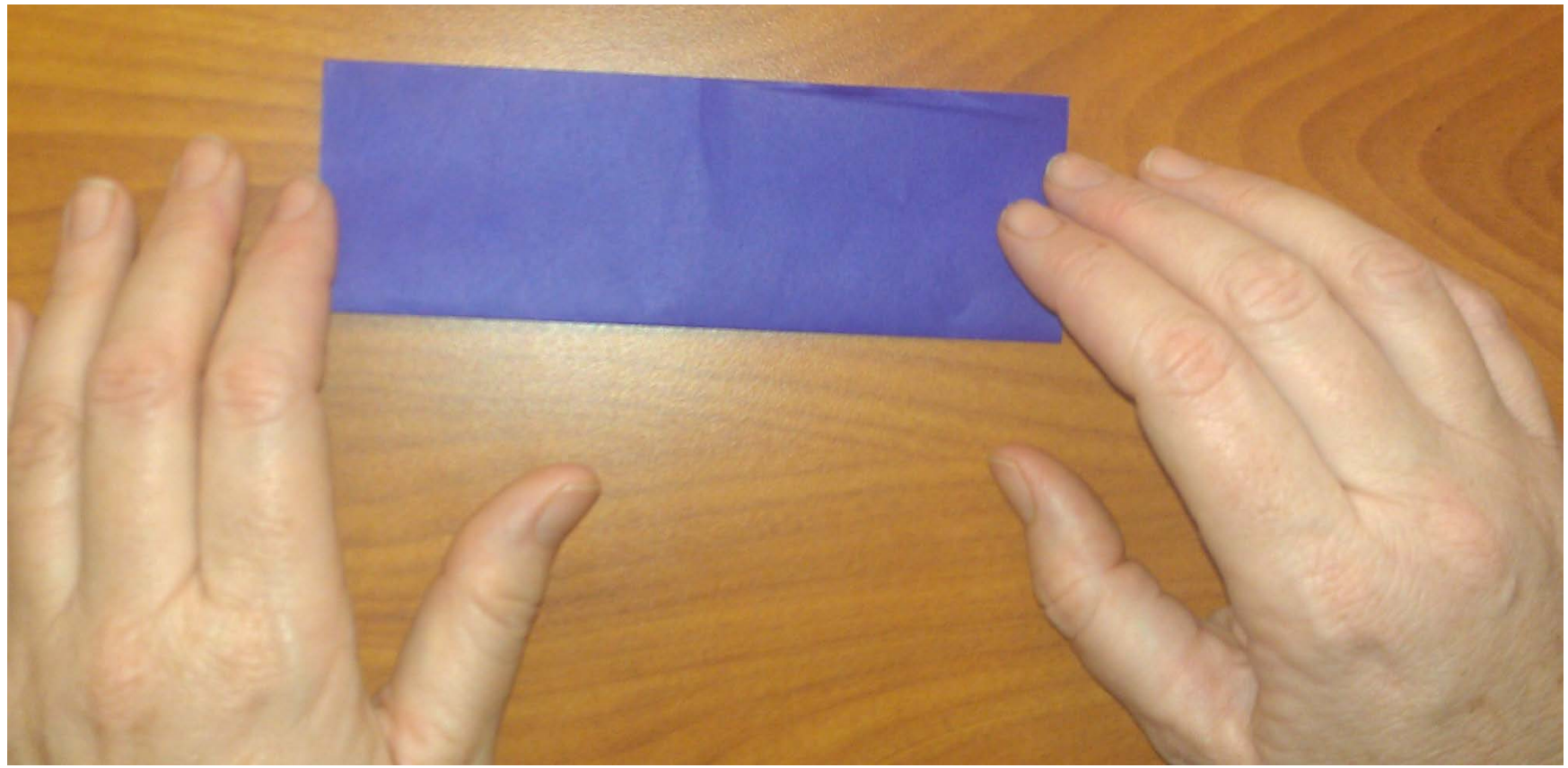
1) Mathematical Practices
2) Inquiry-based learning: curiosity, exploration and creation
3) Response to Failure

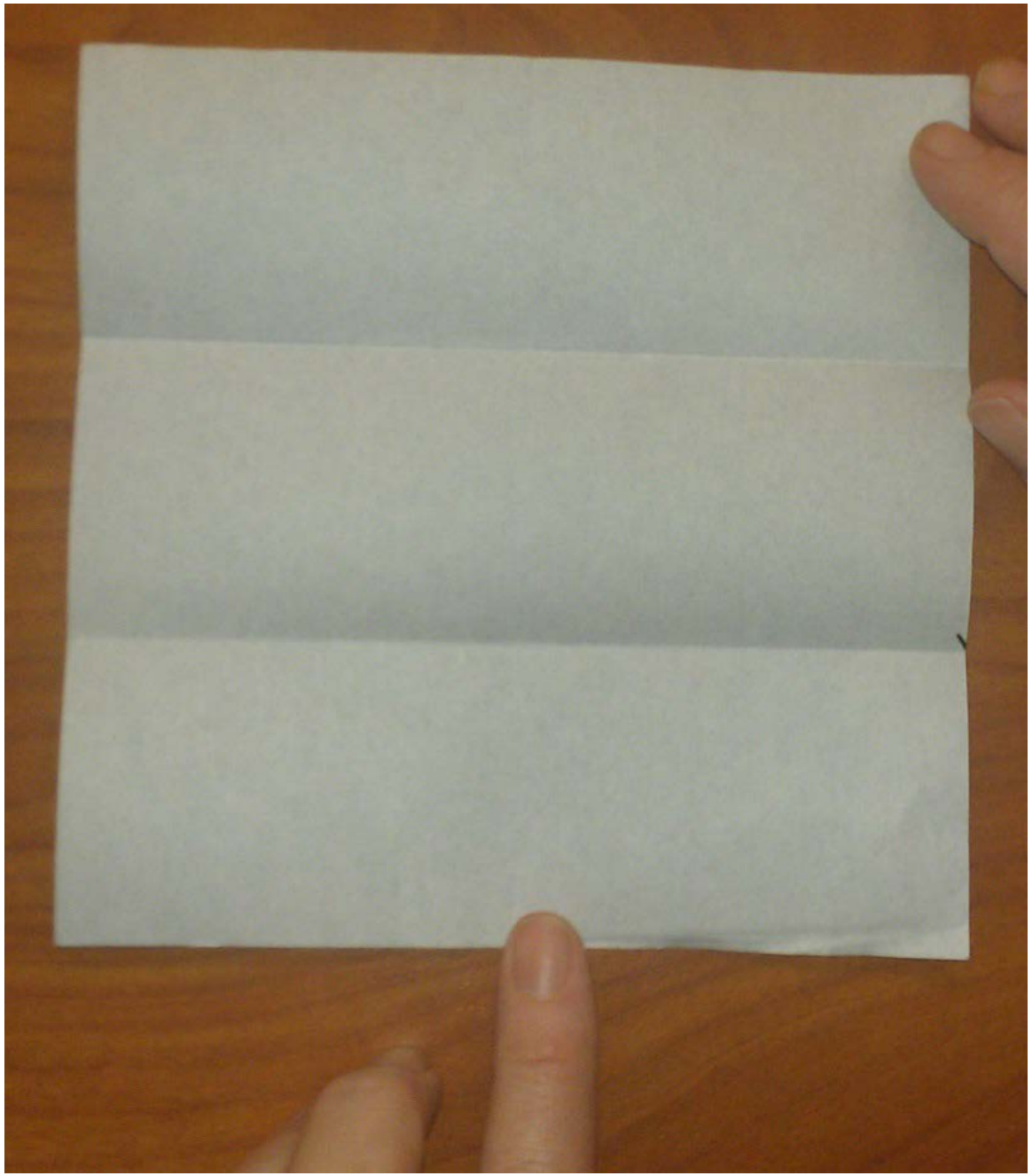
Opportunities for Laughter

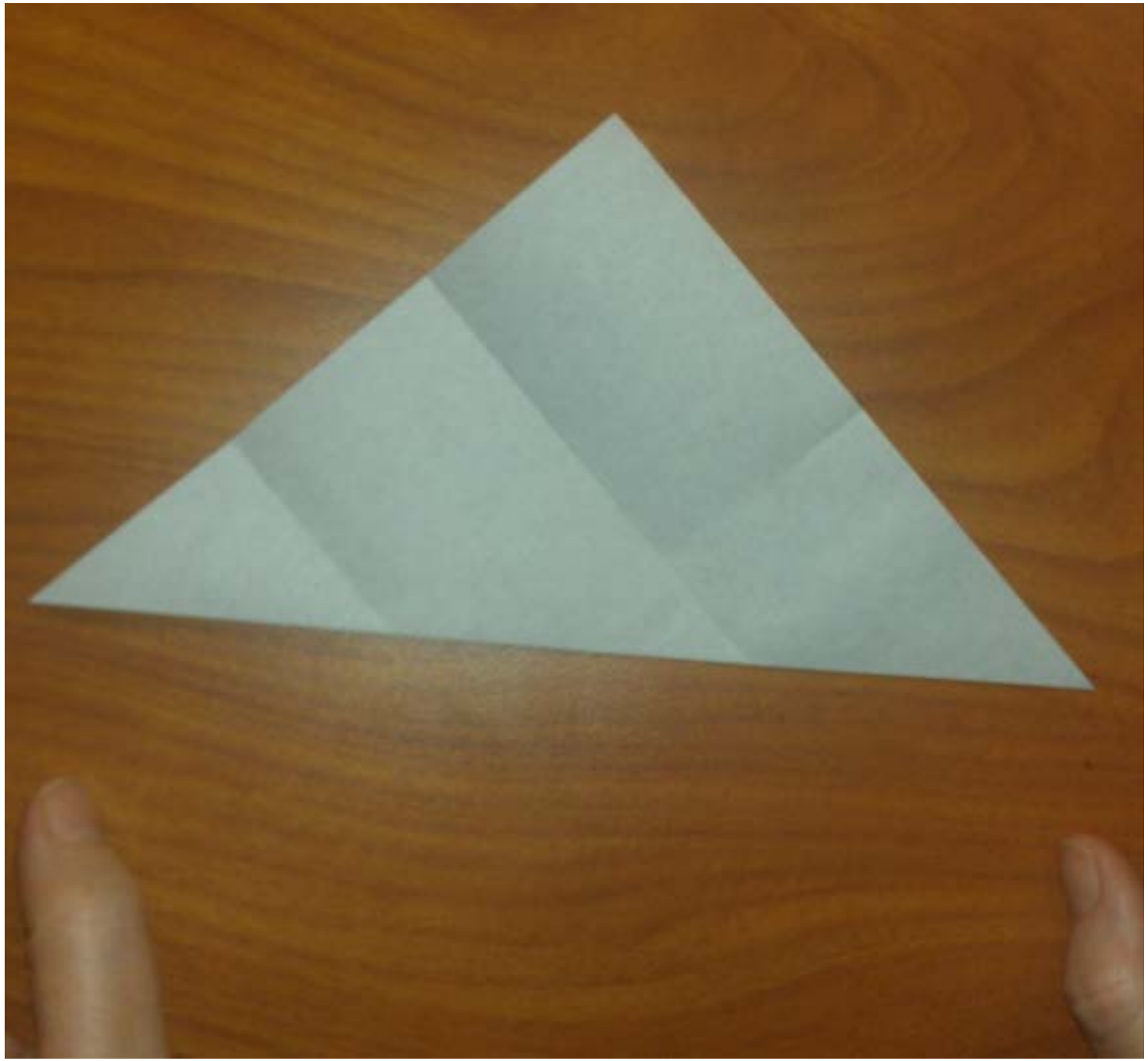


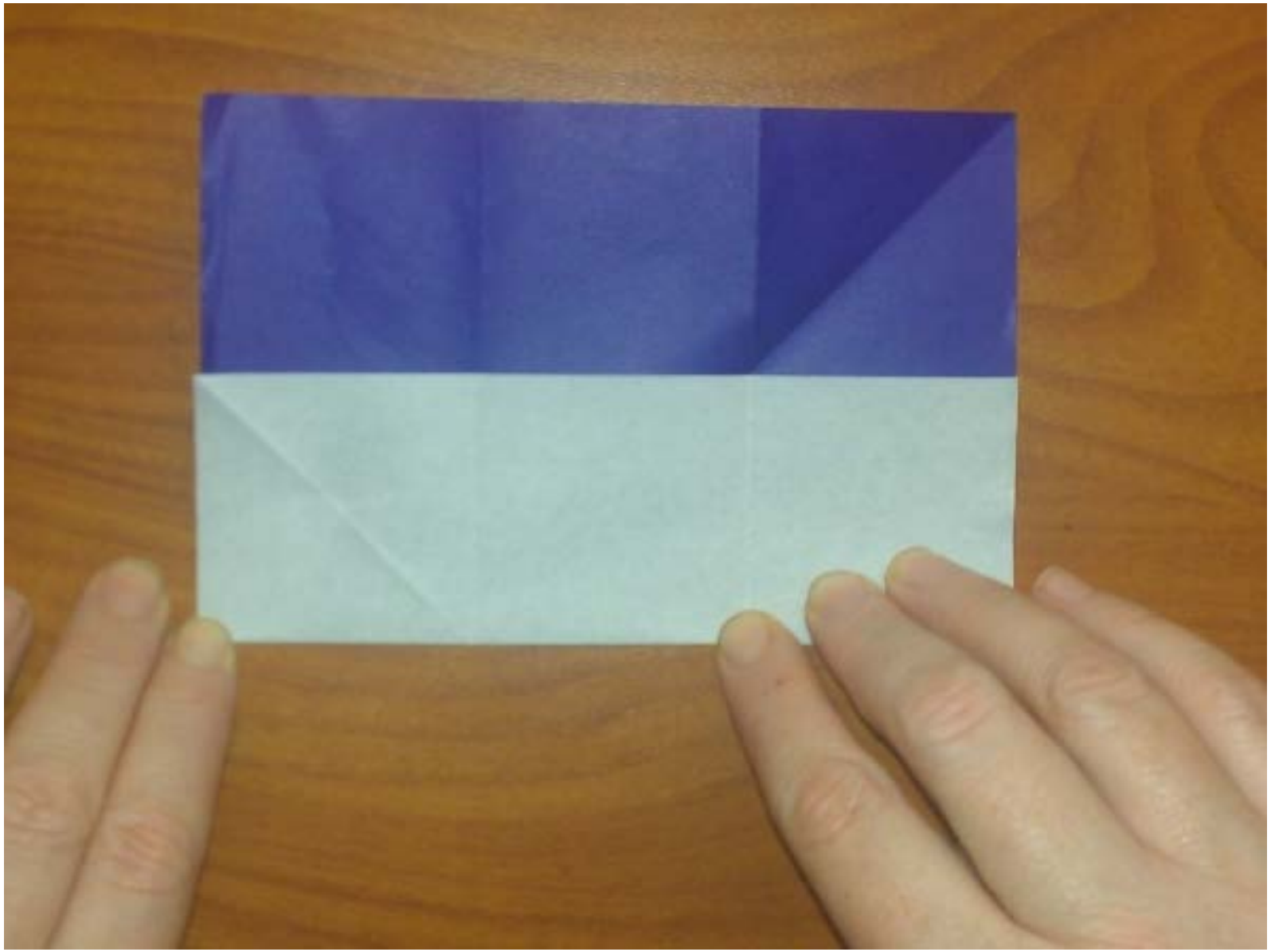


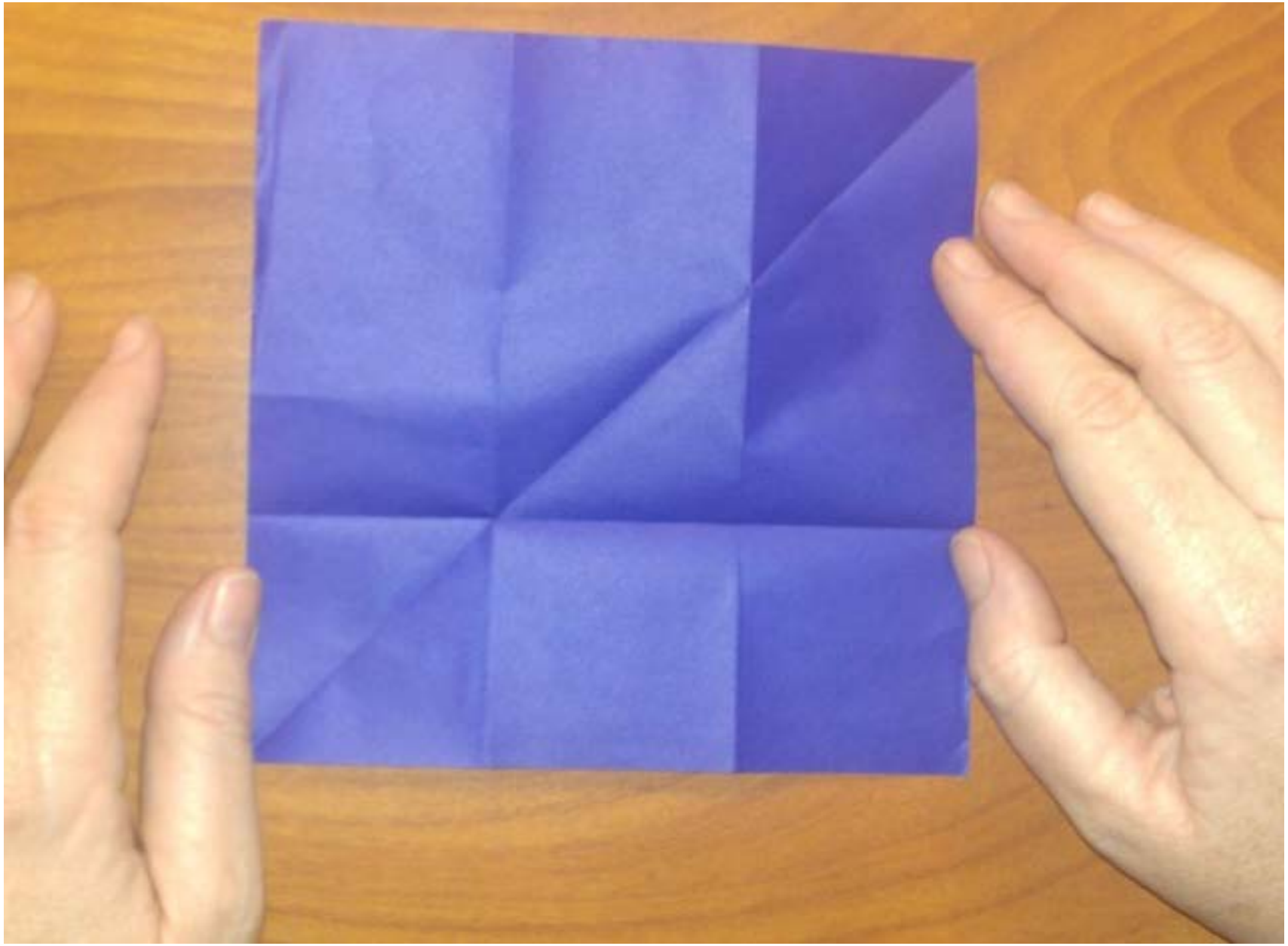


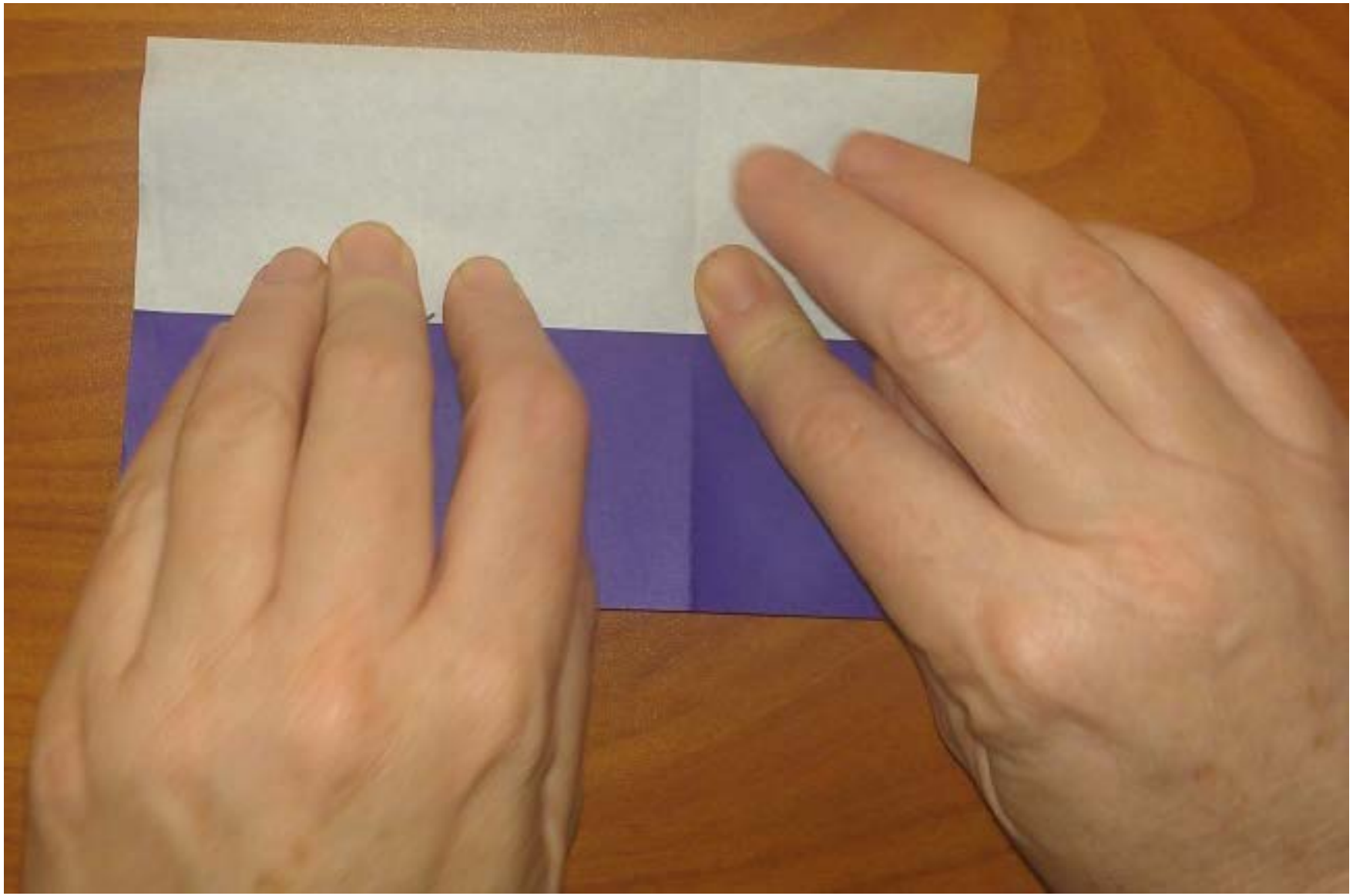


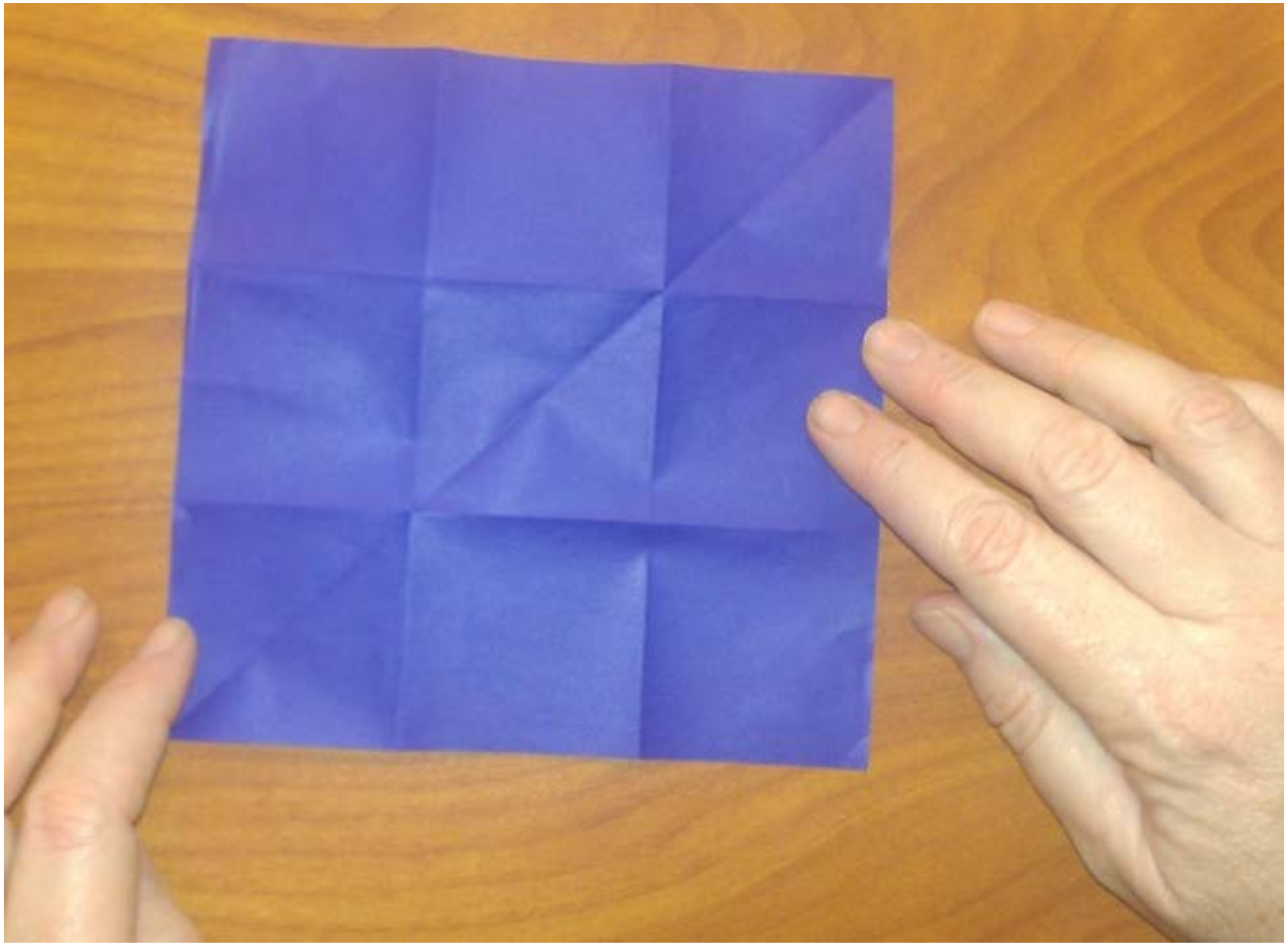


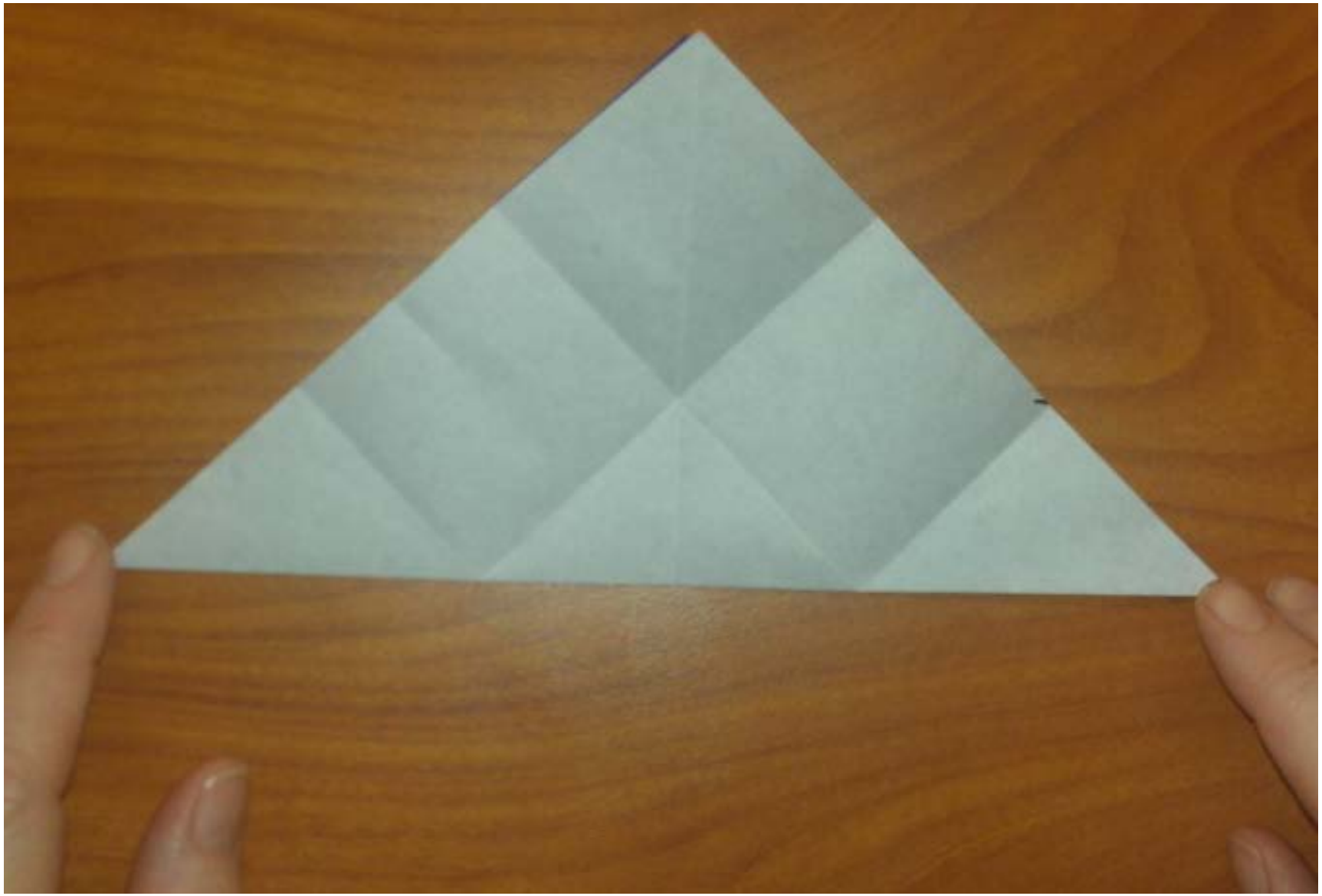


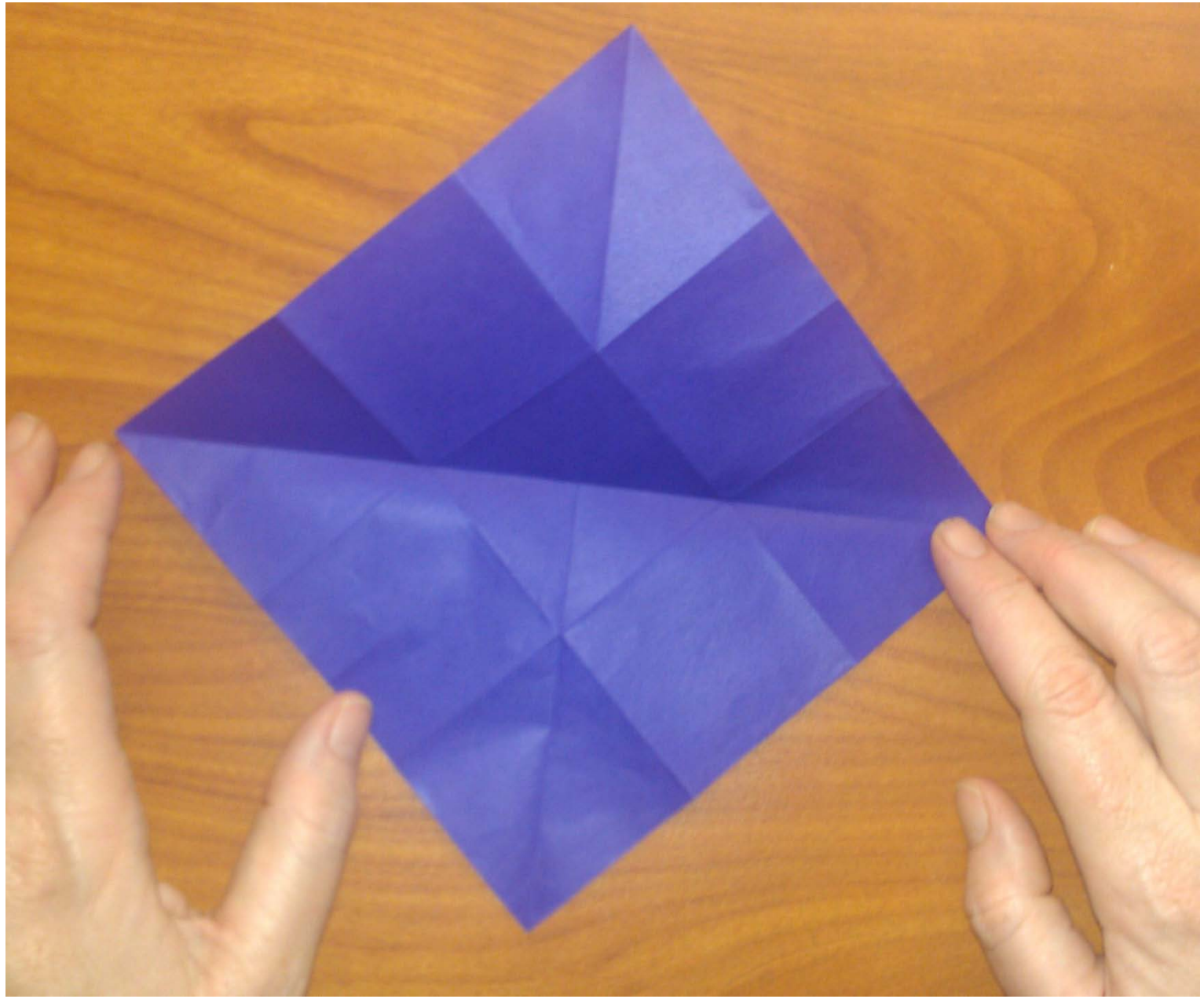


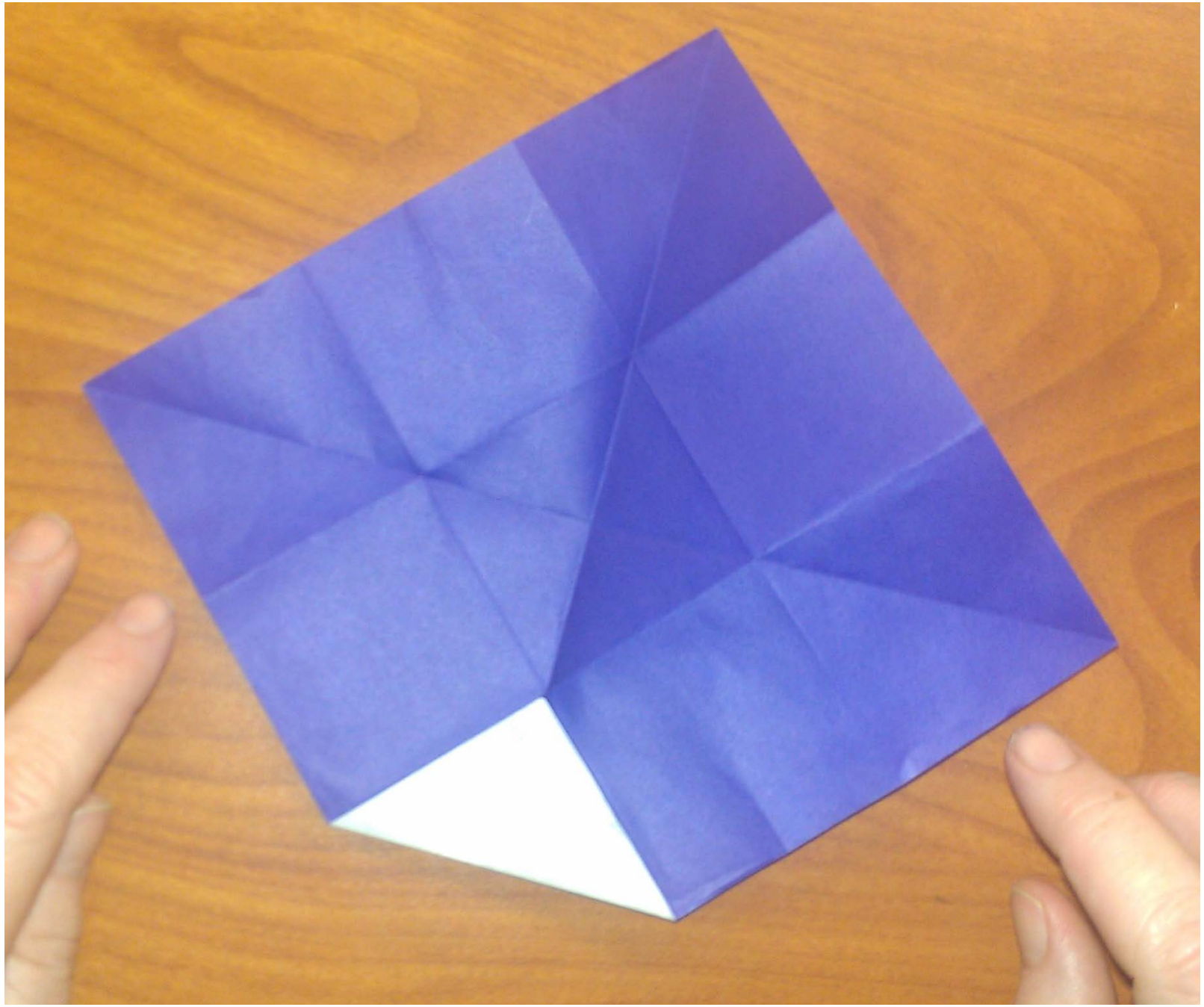


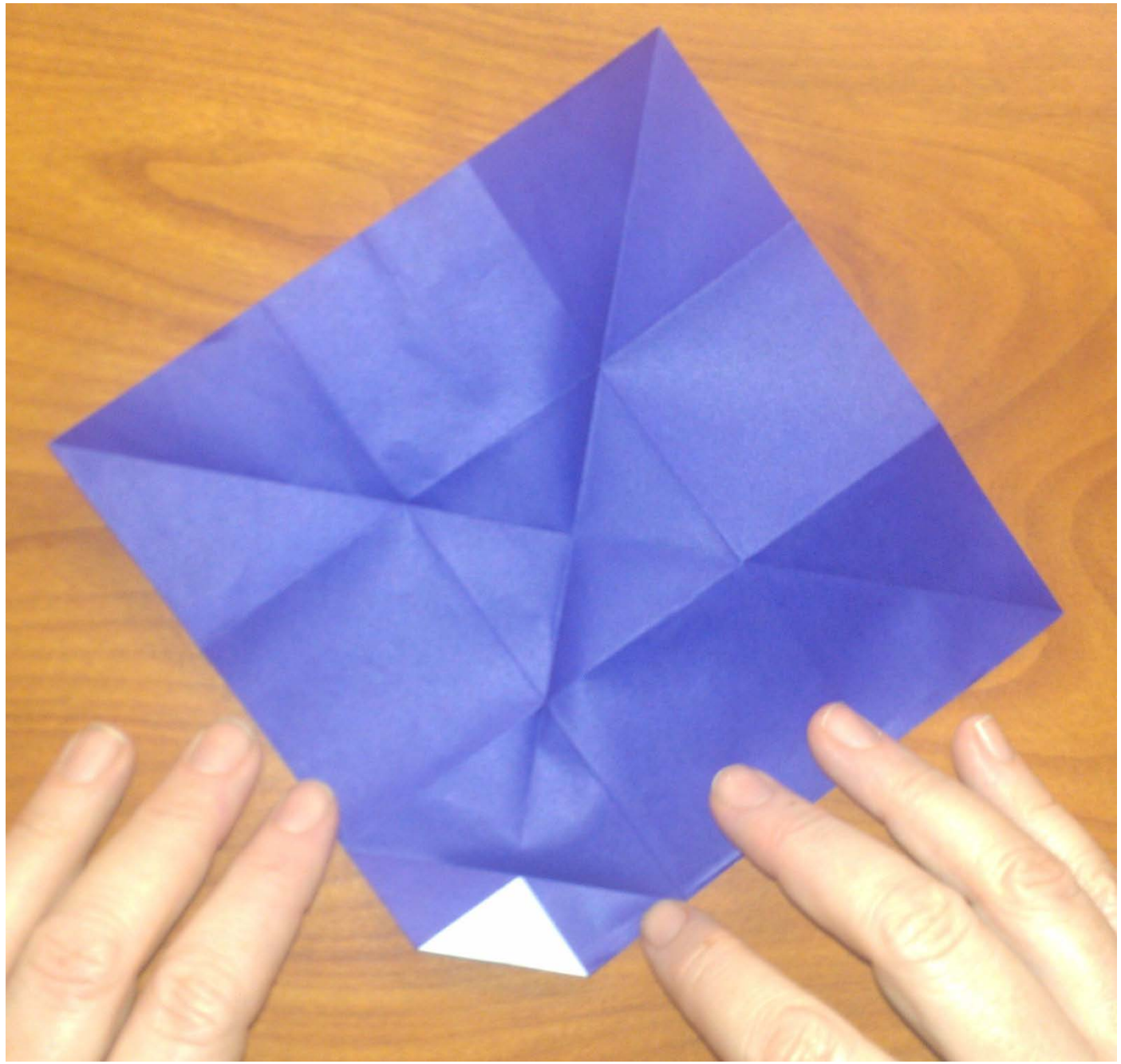


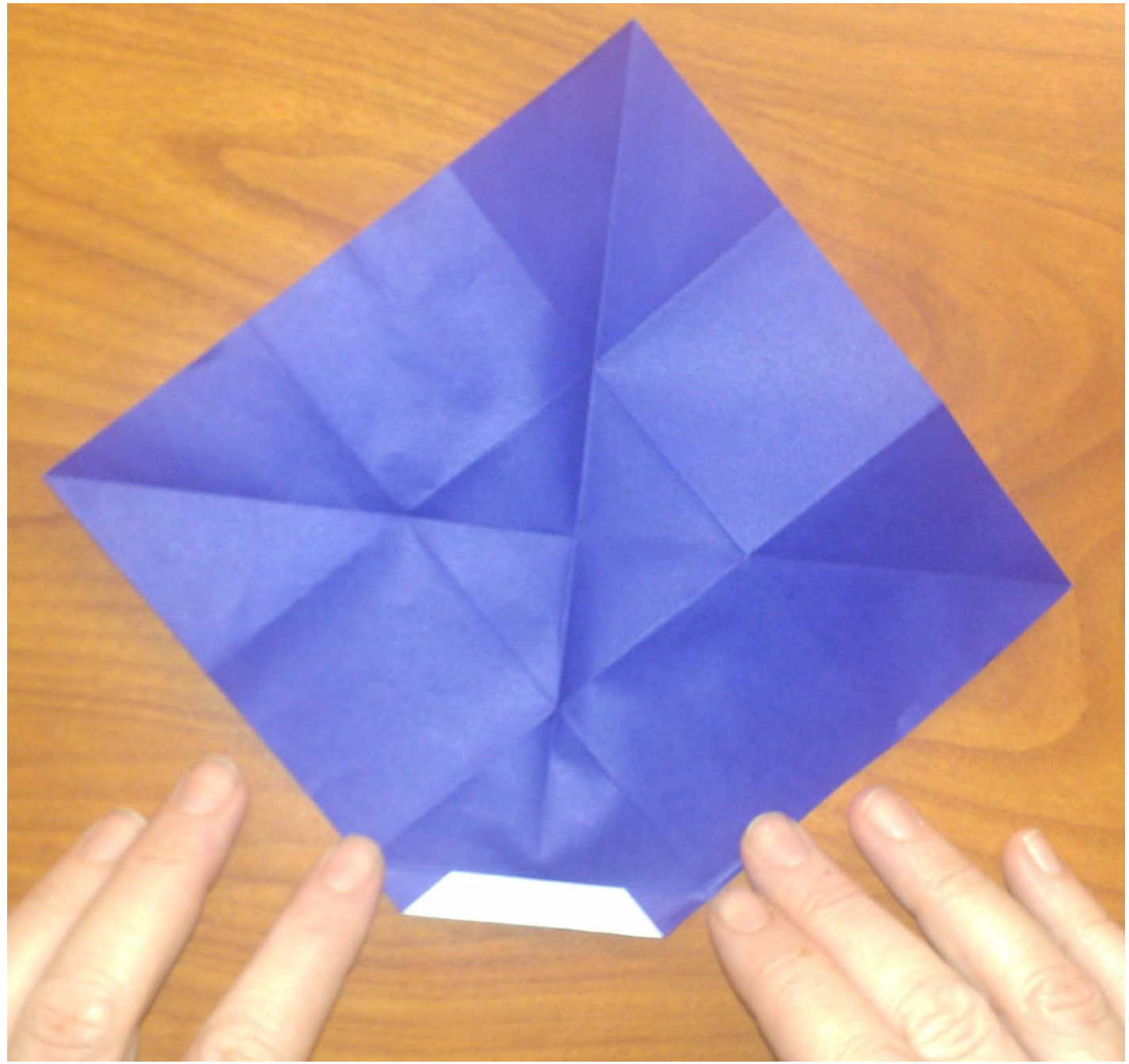


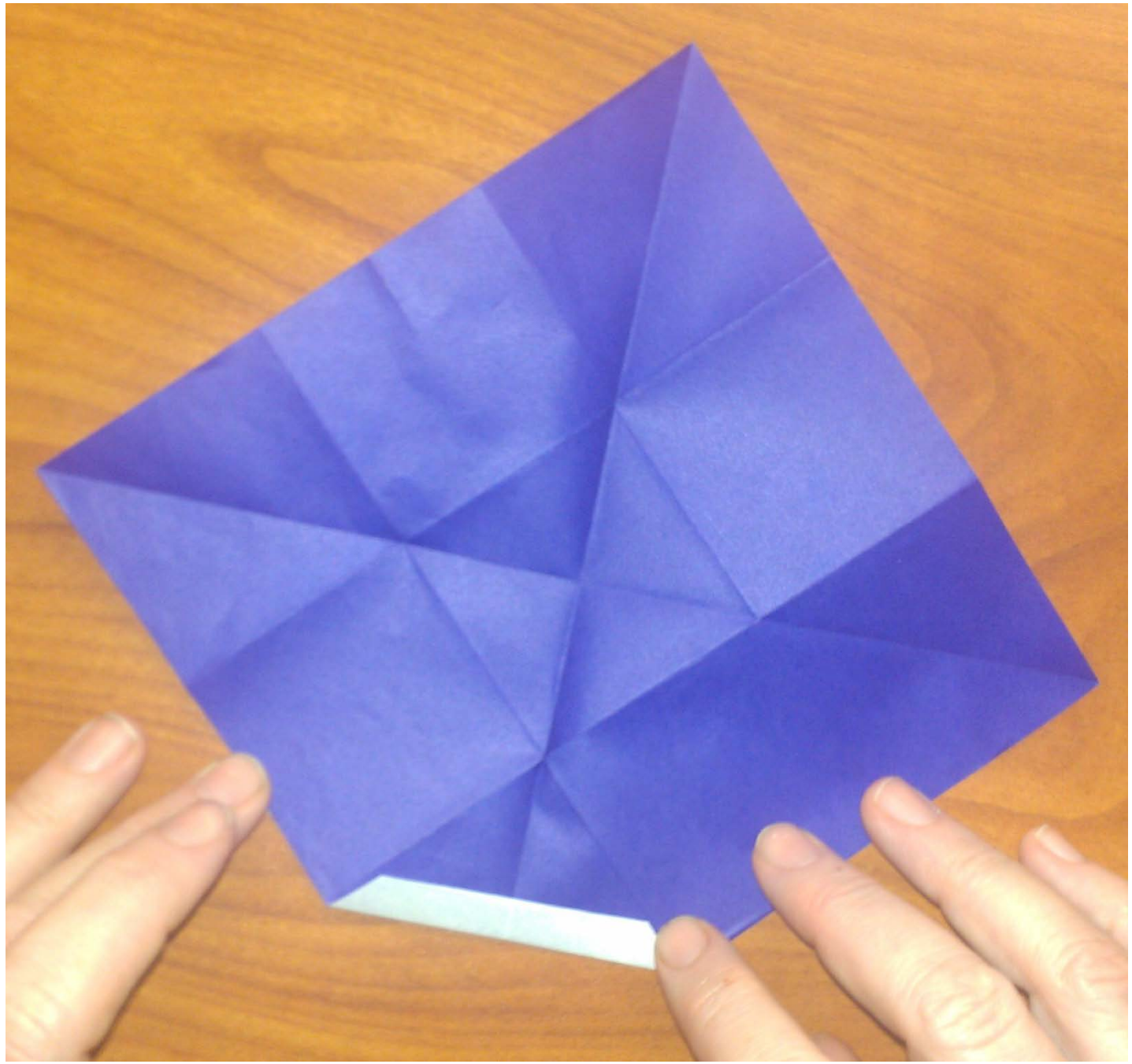


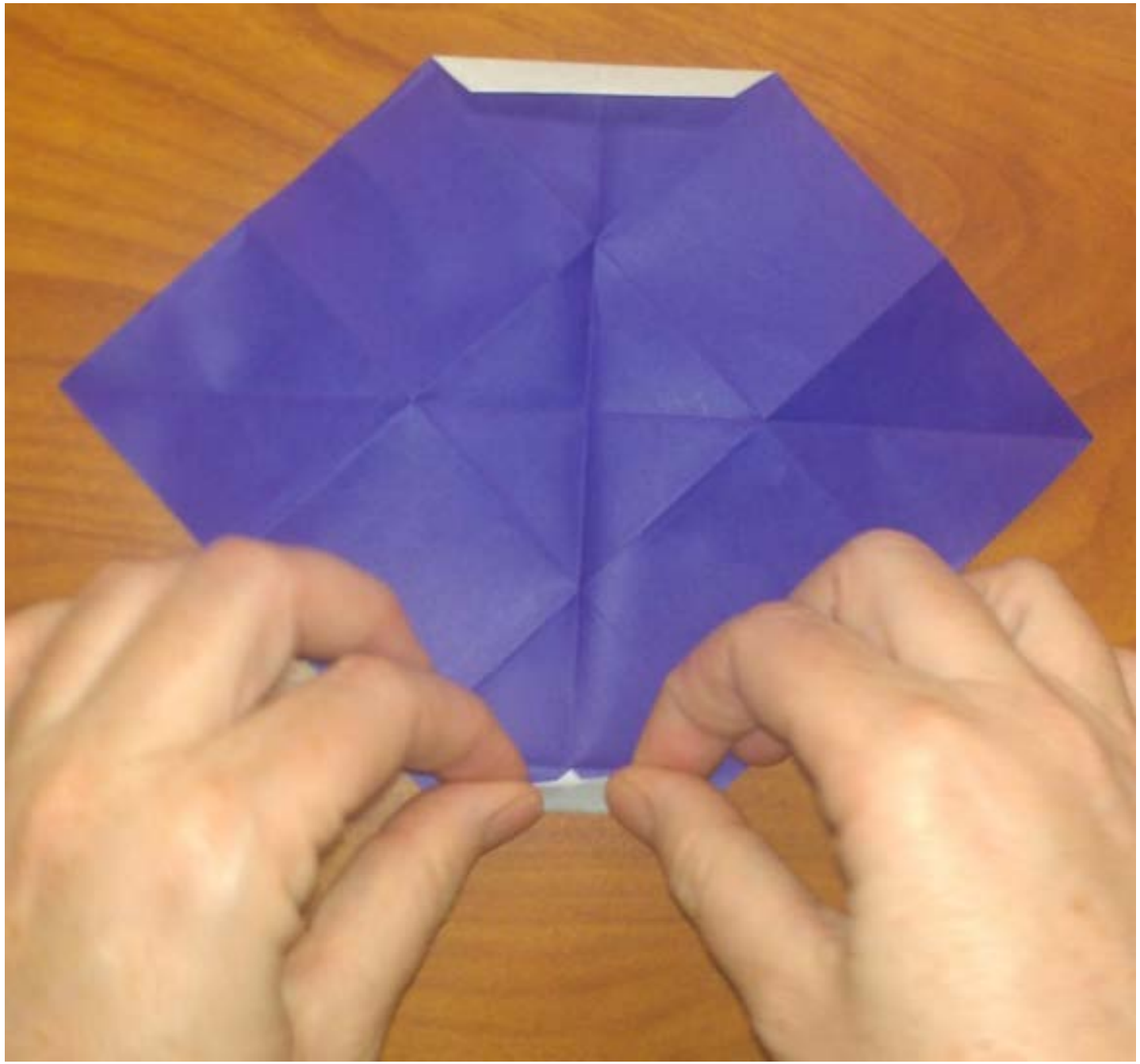


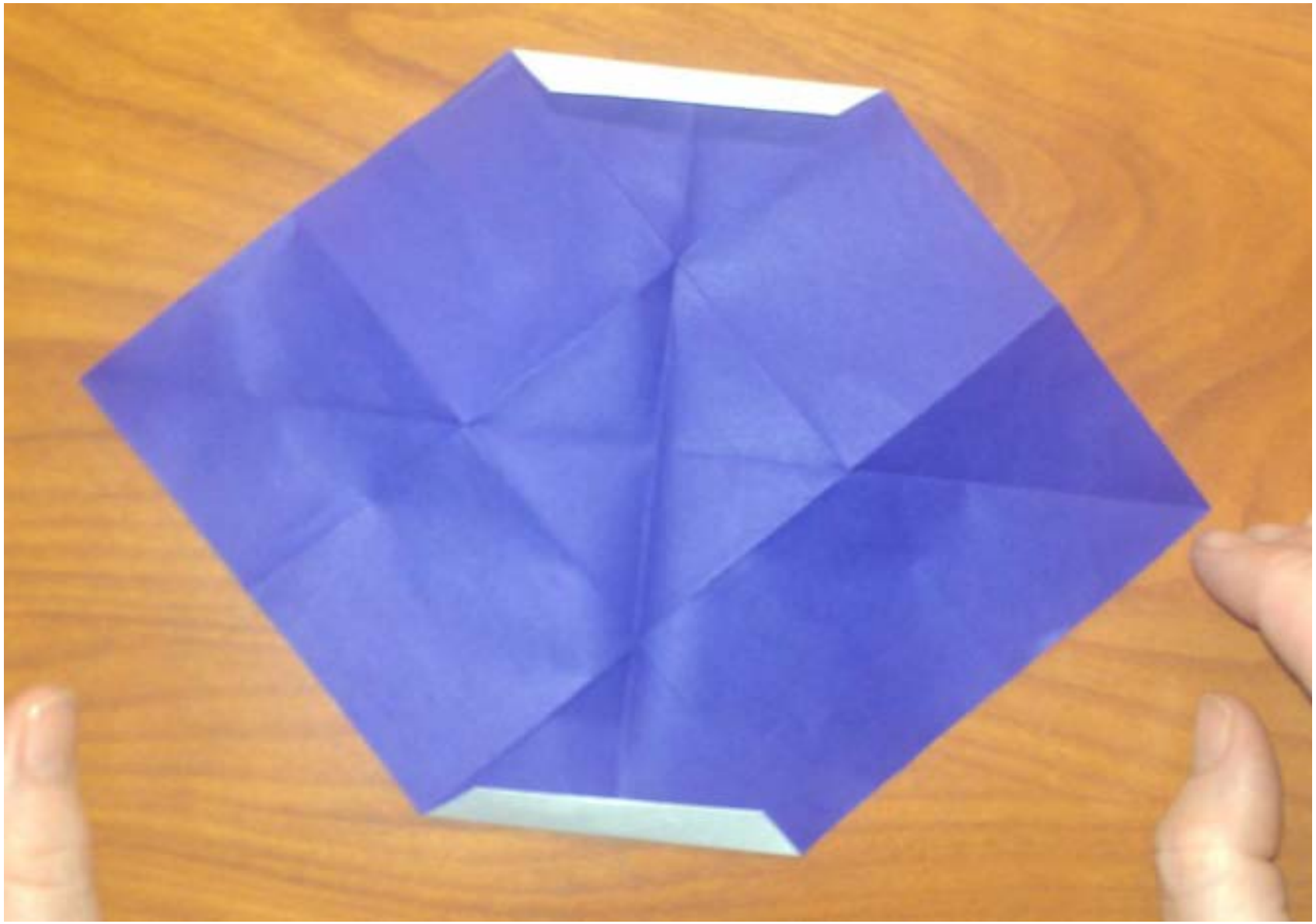


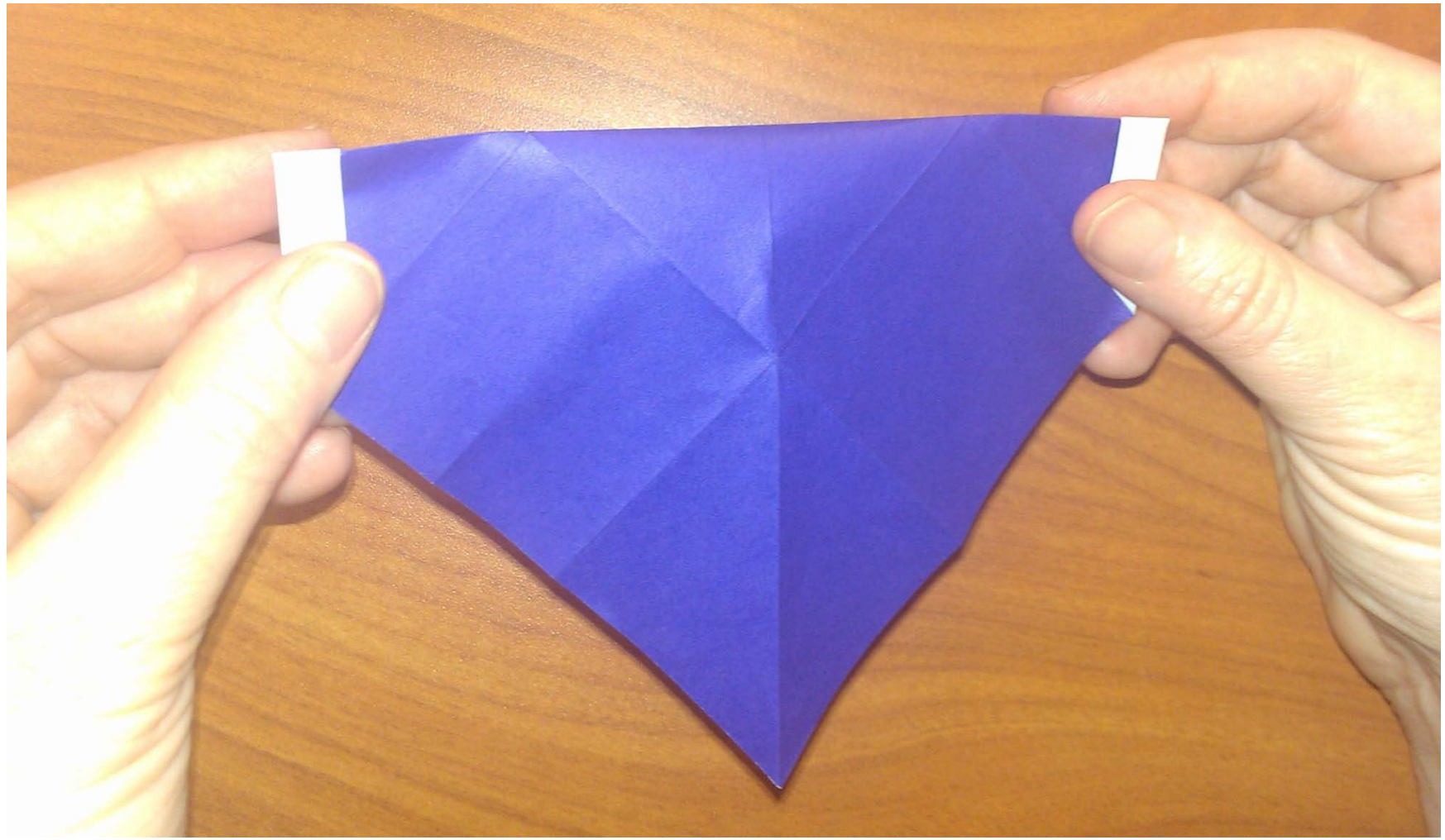


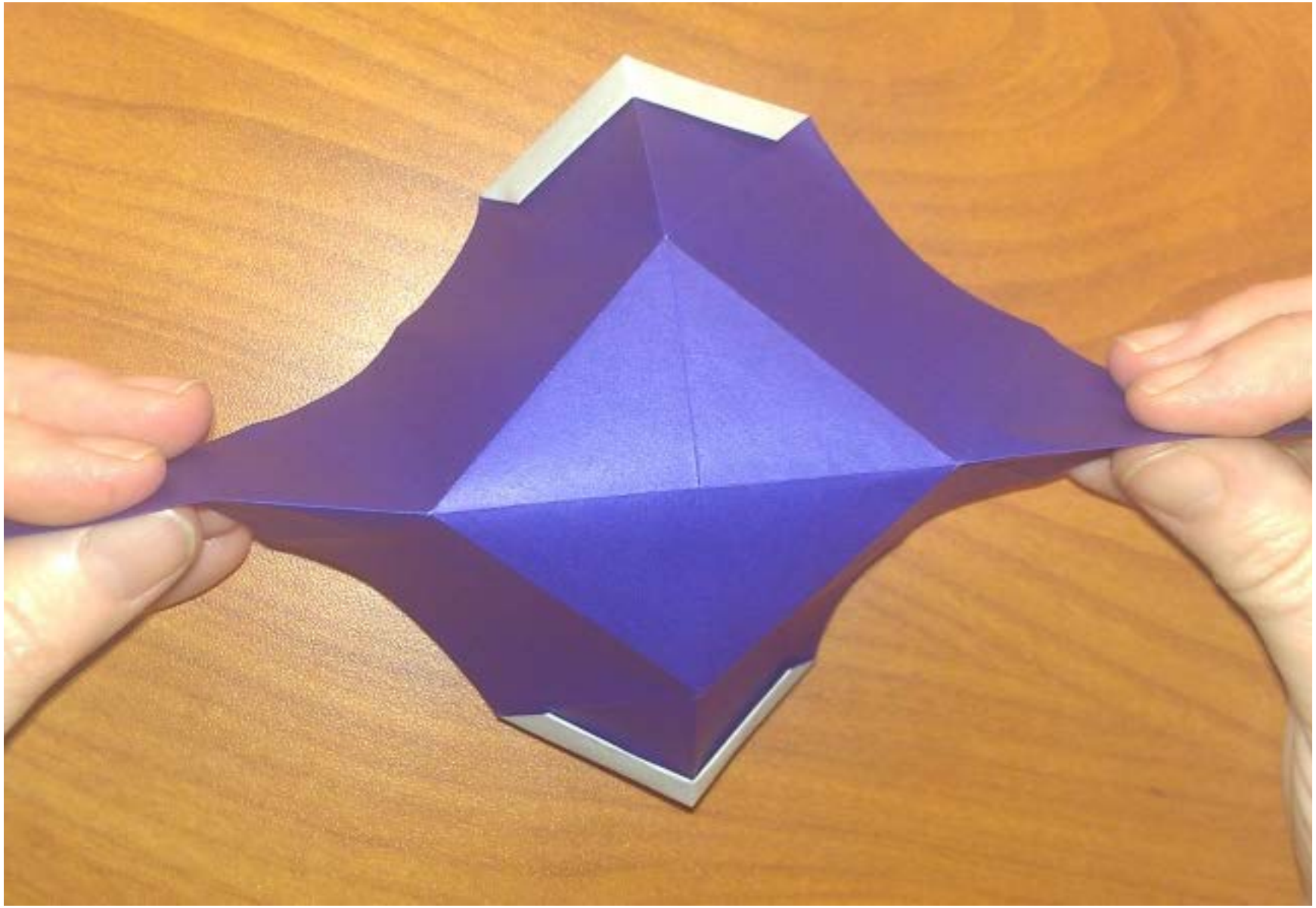


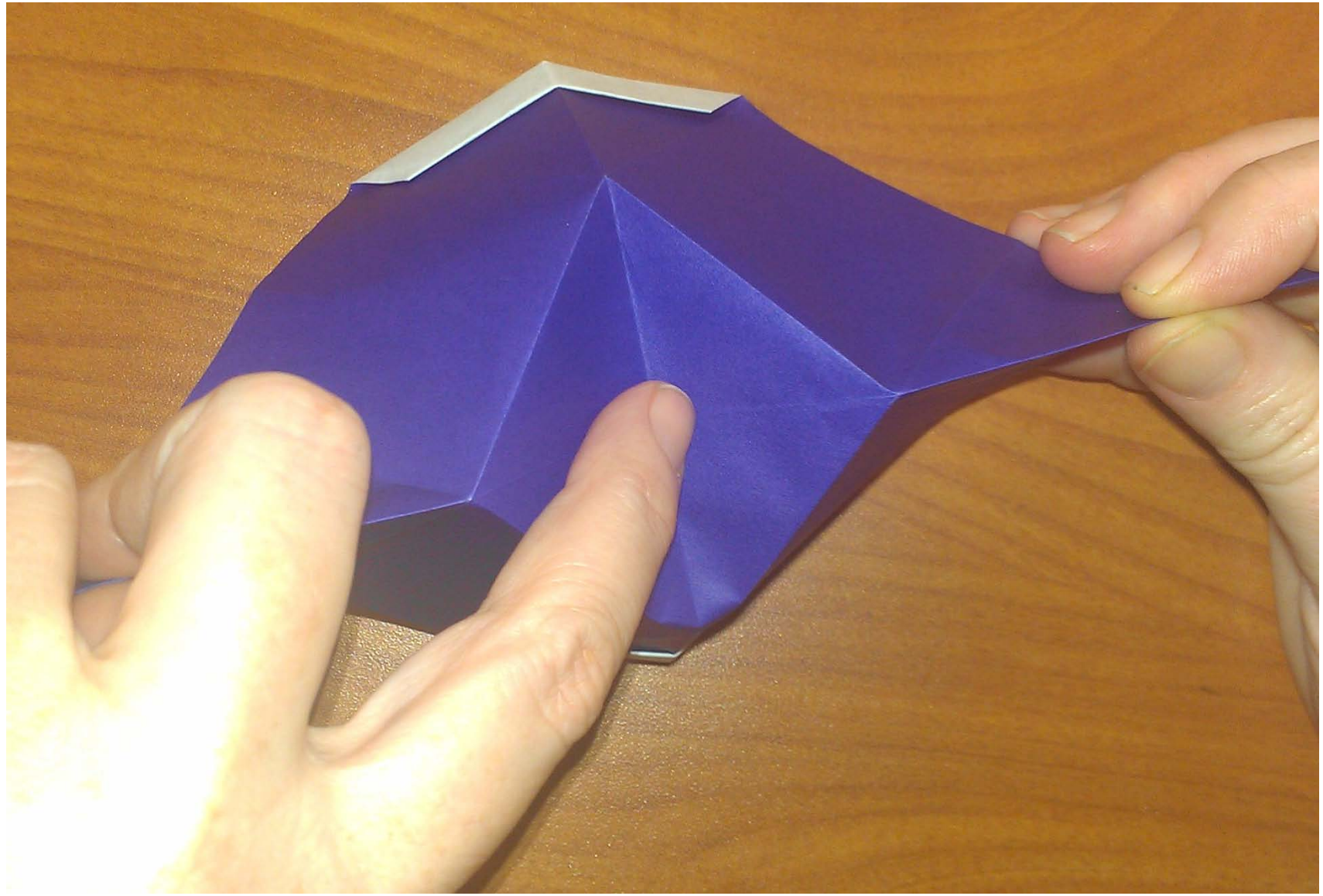


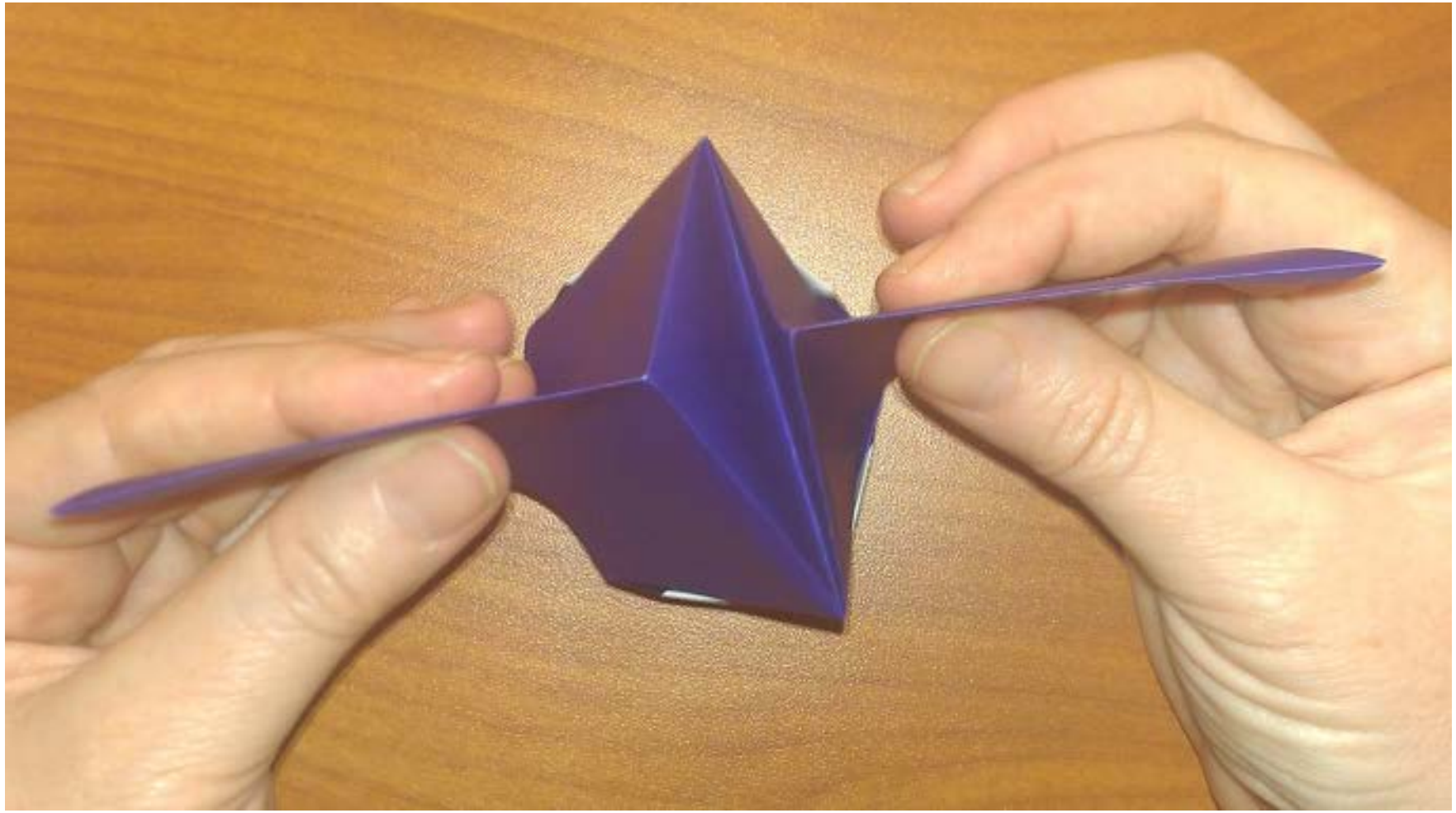


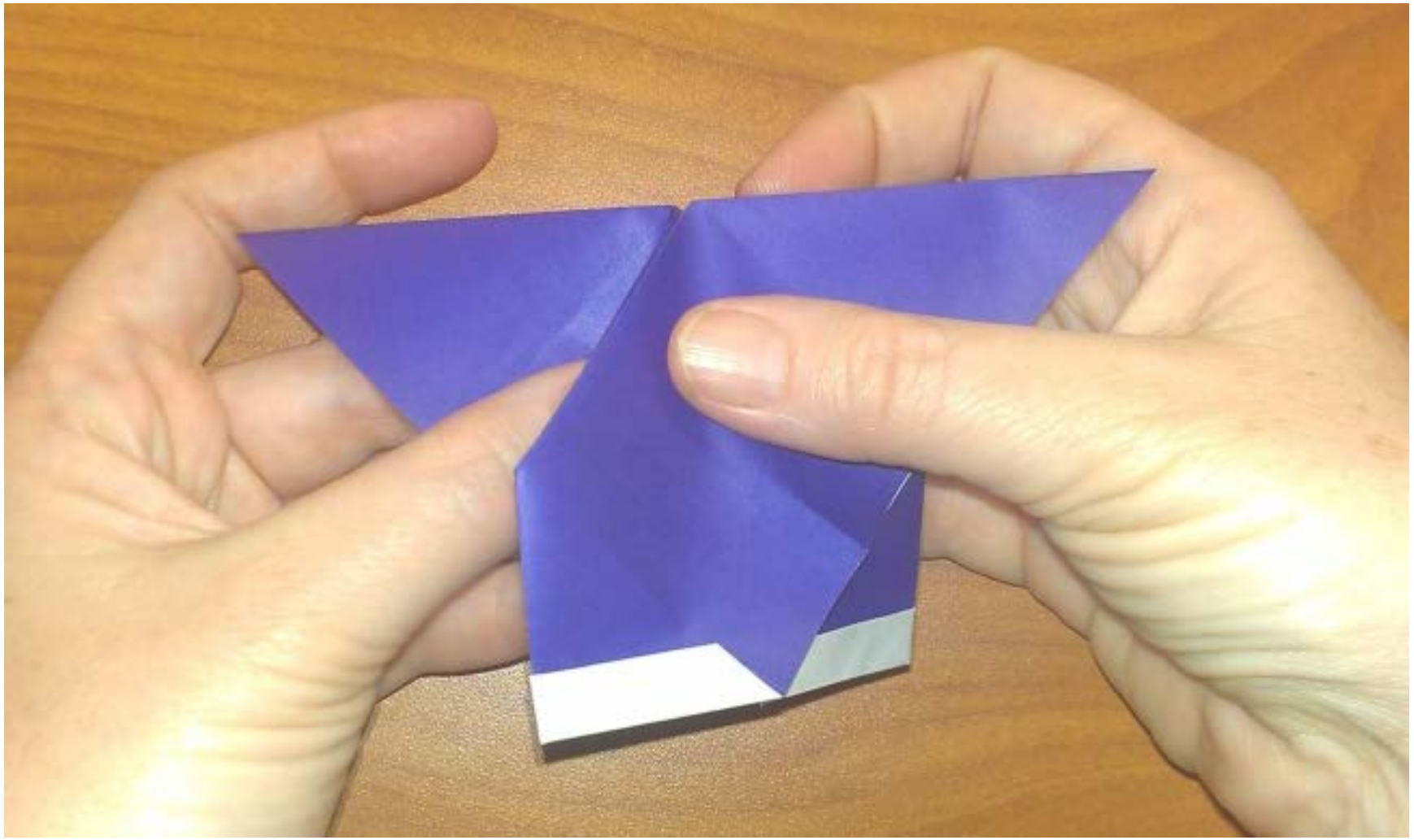


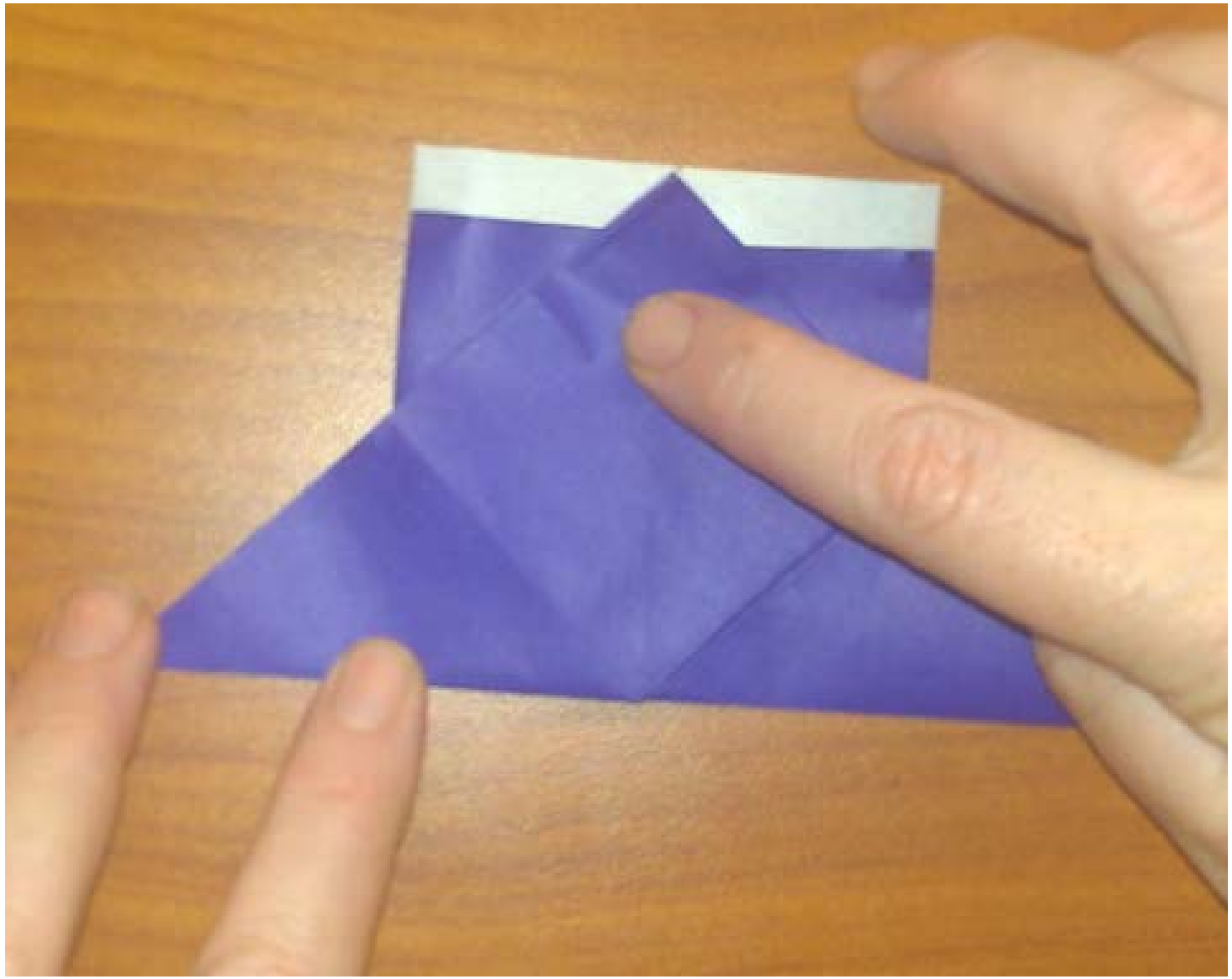


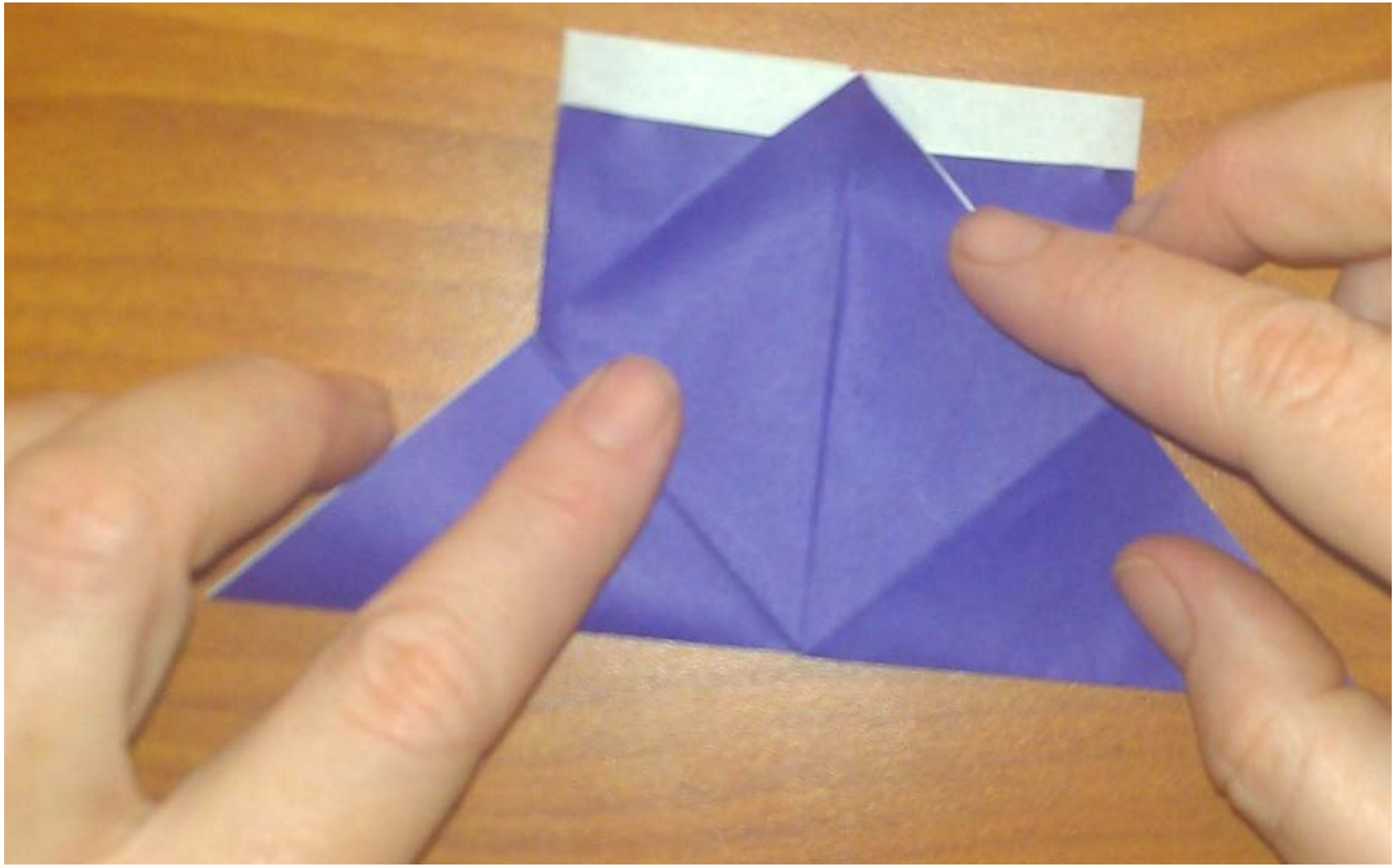


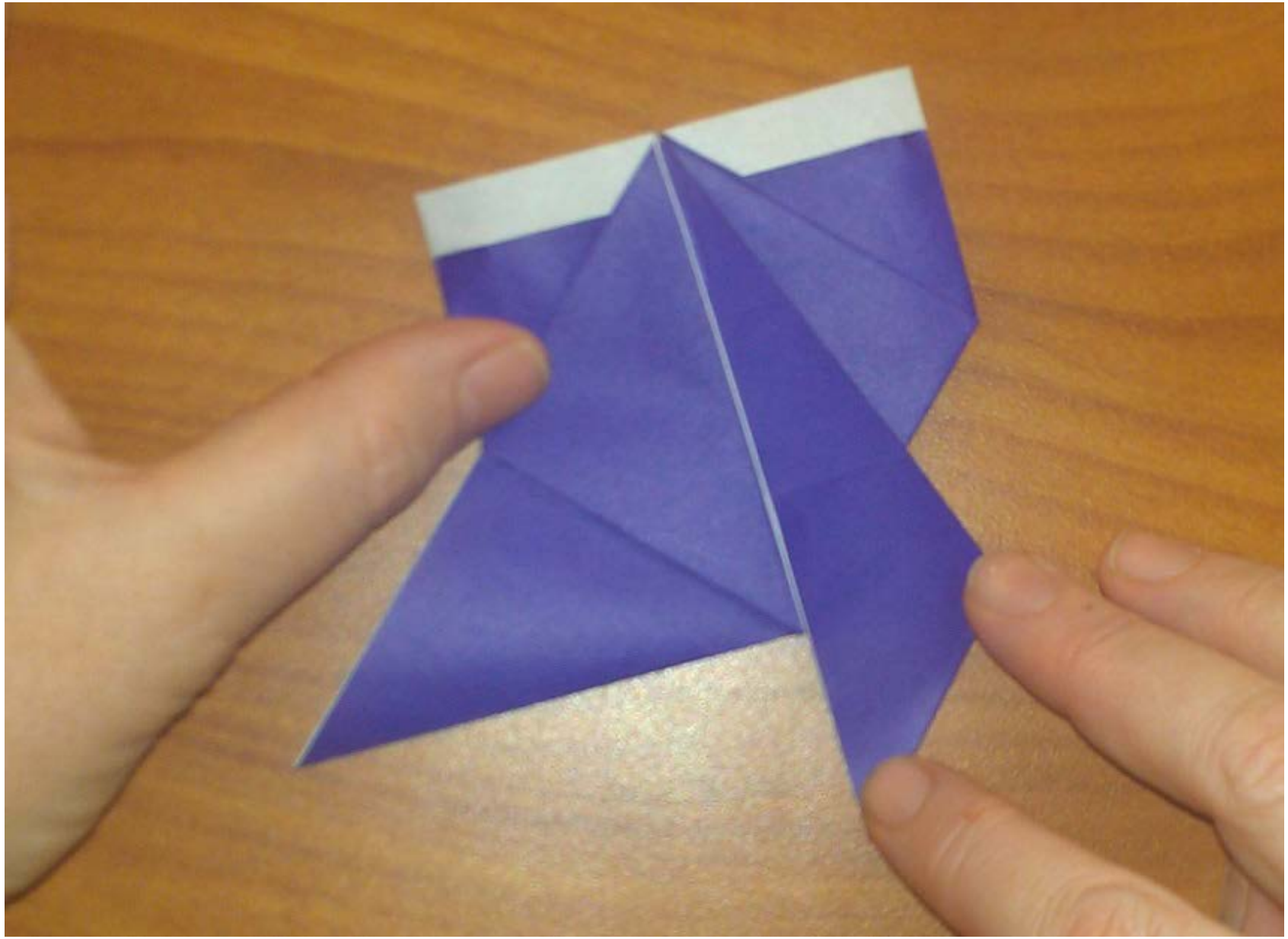


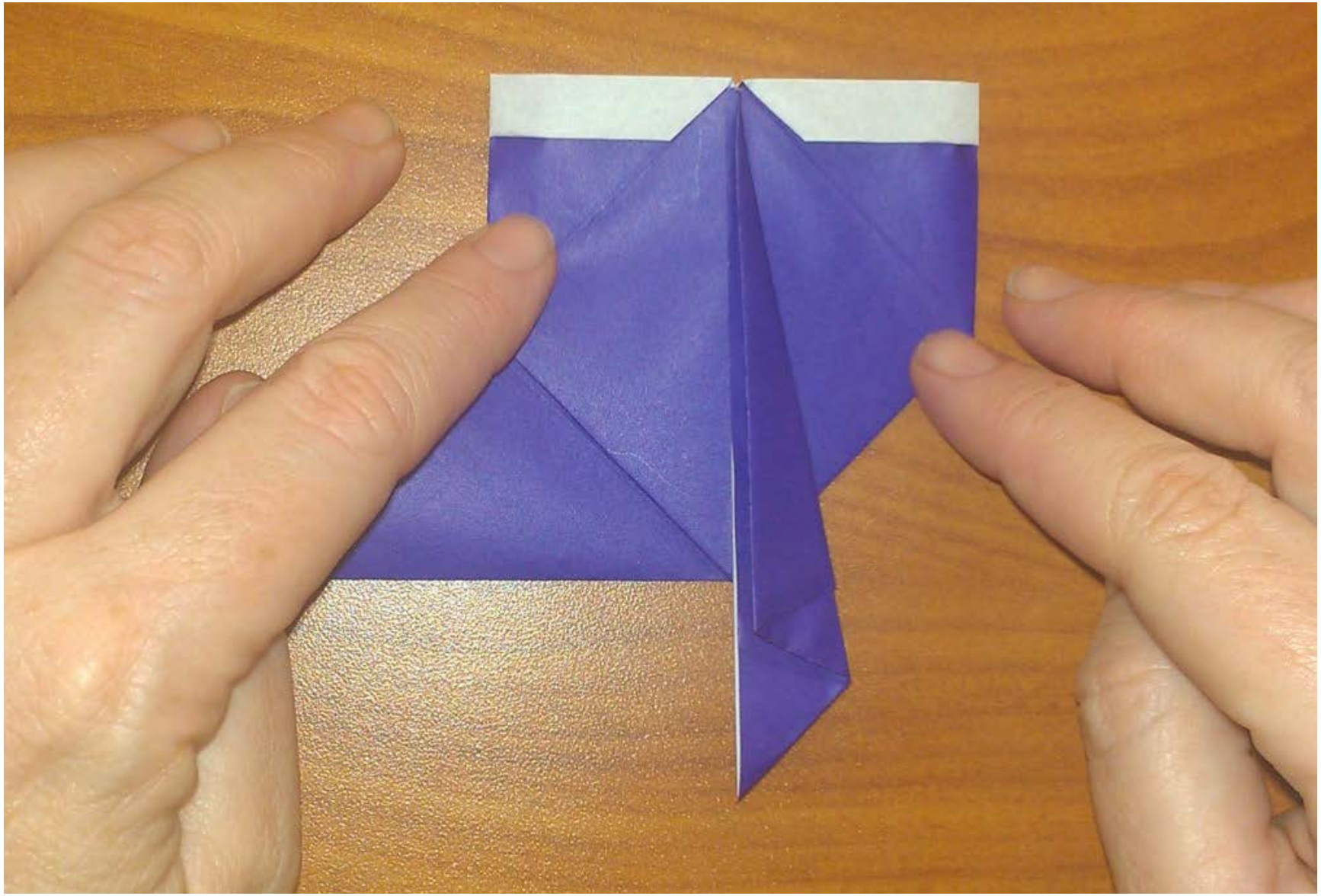


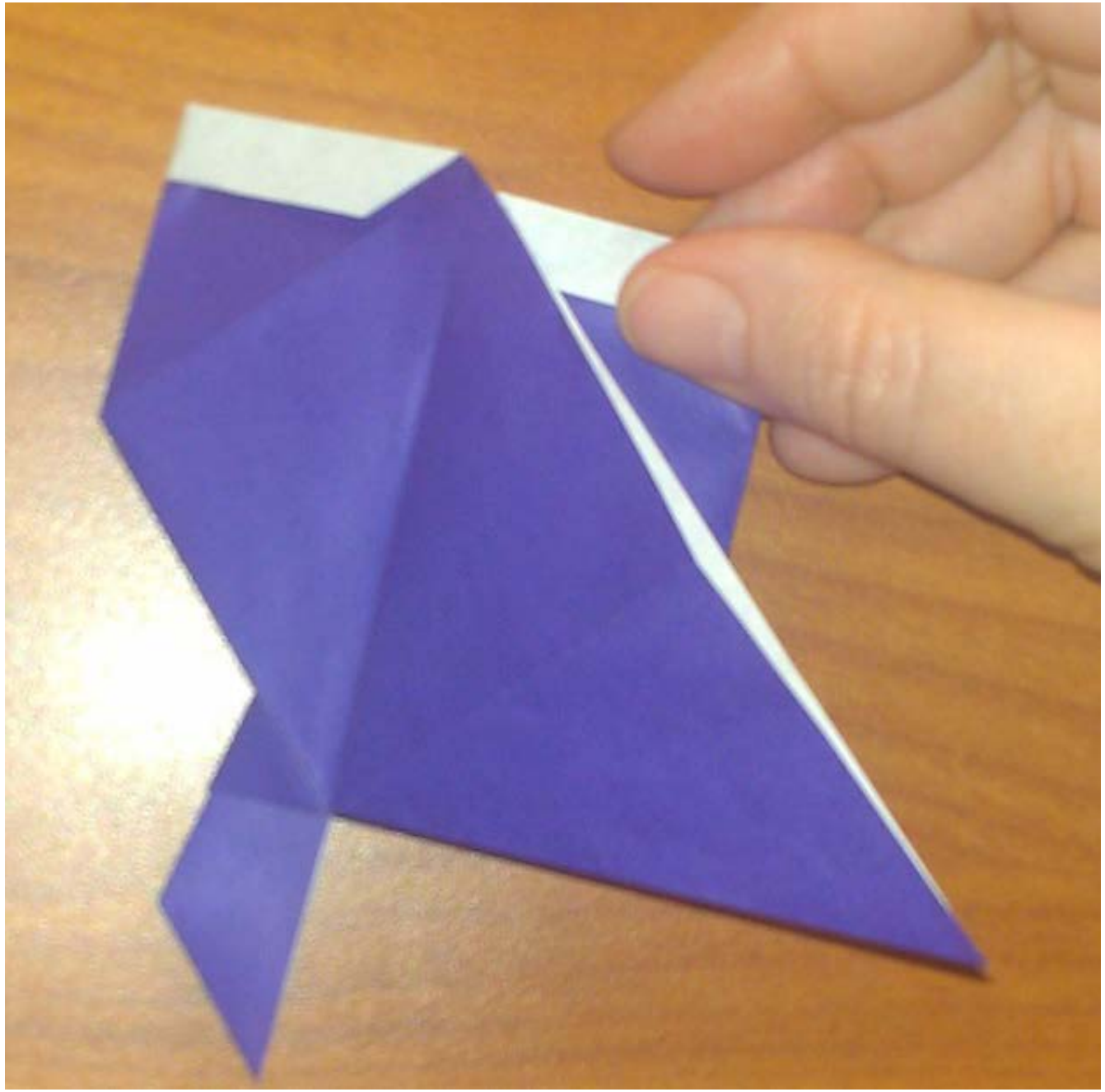


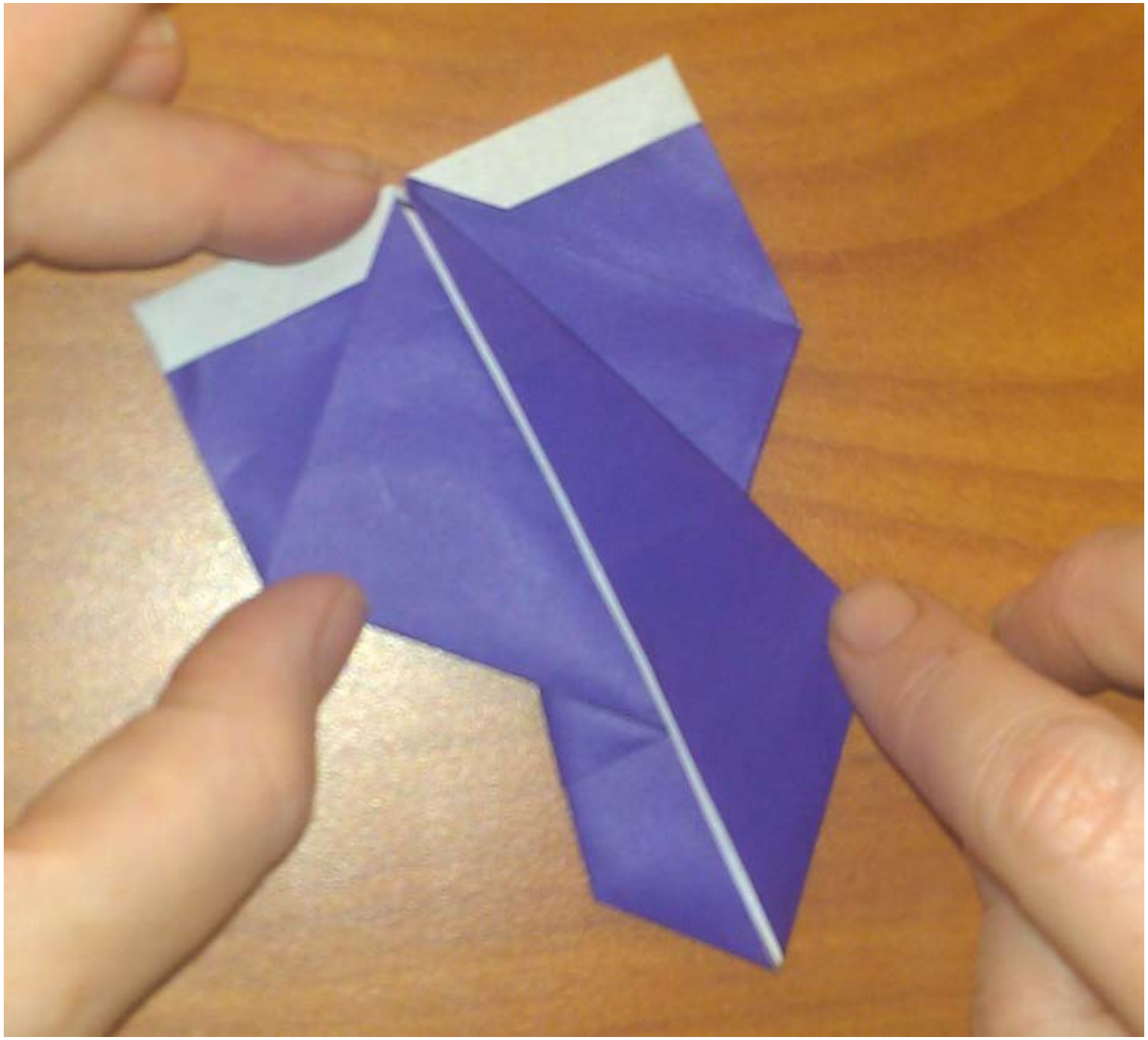


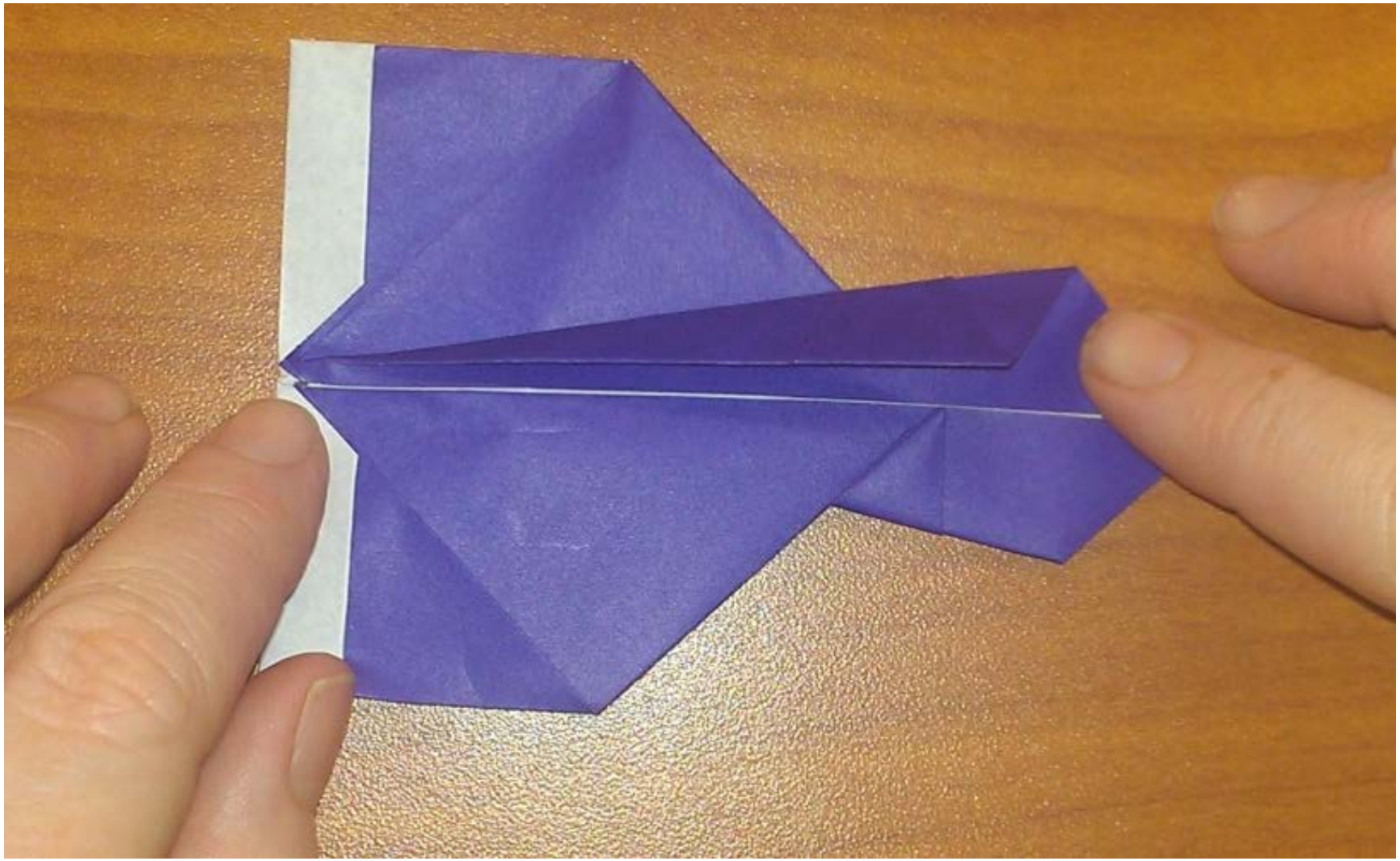


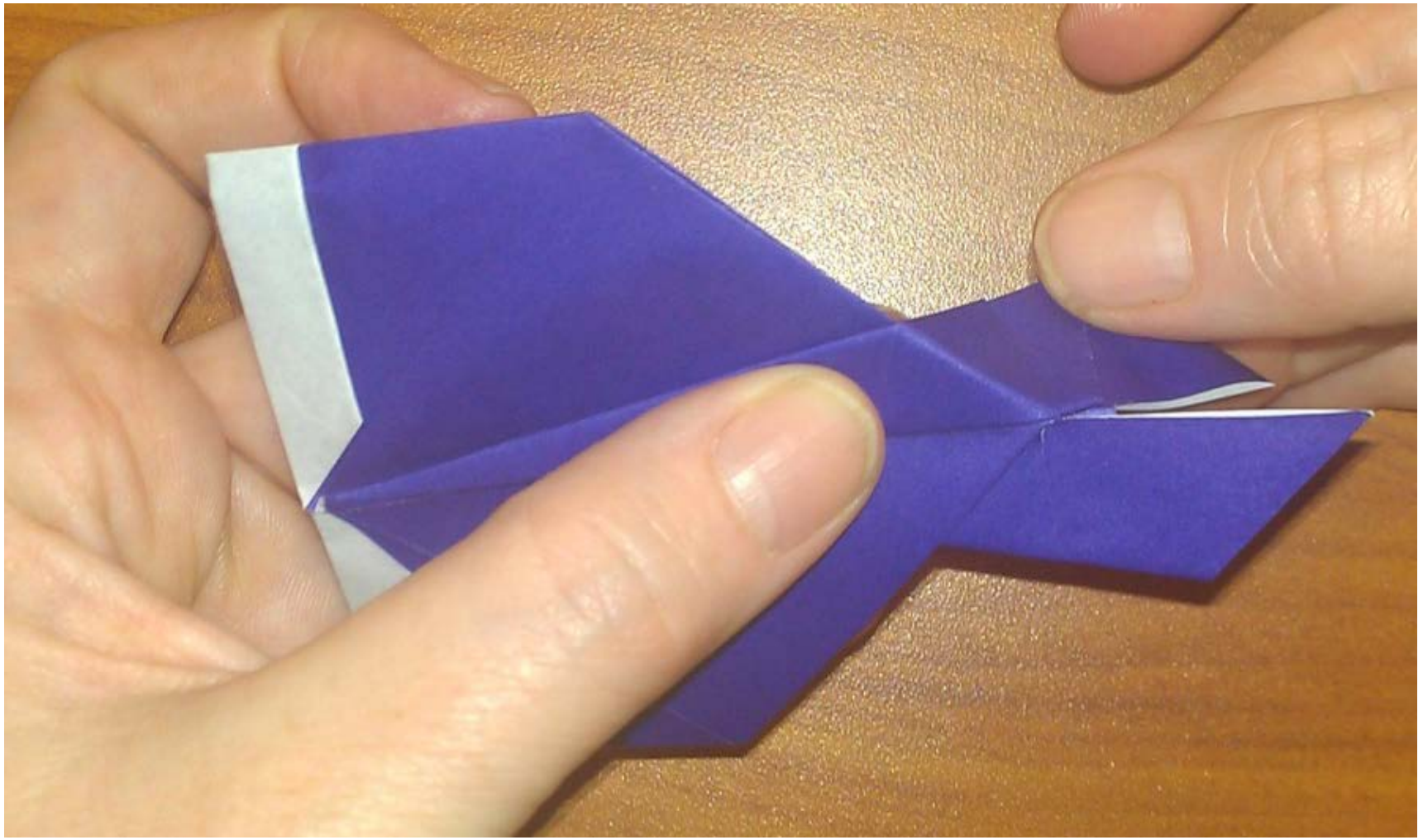


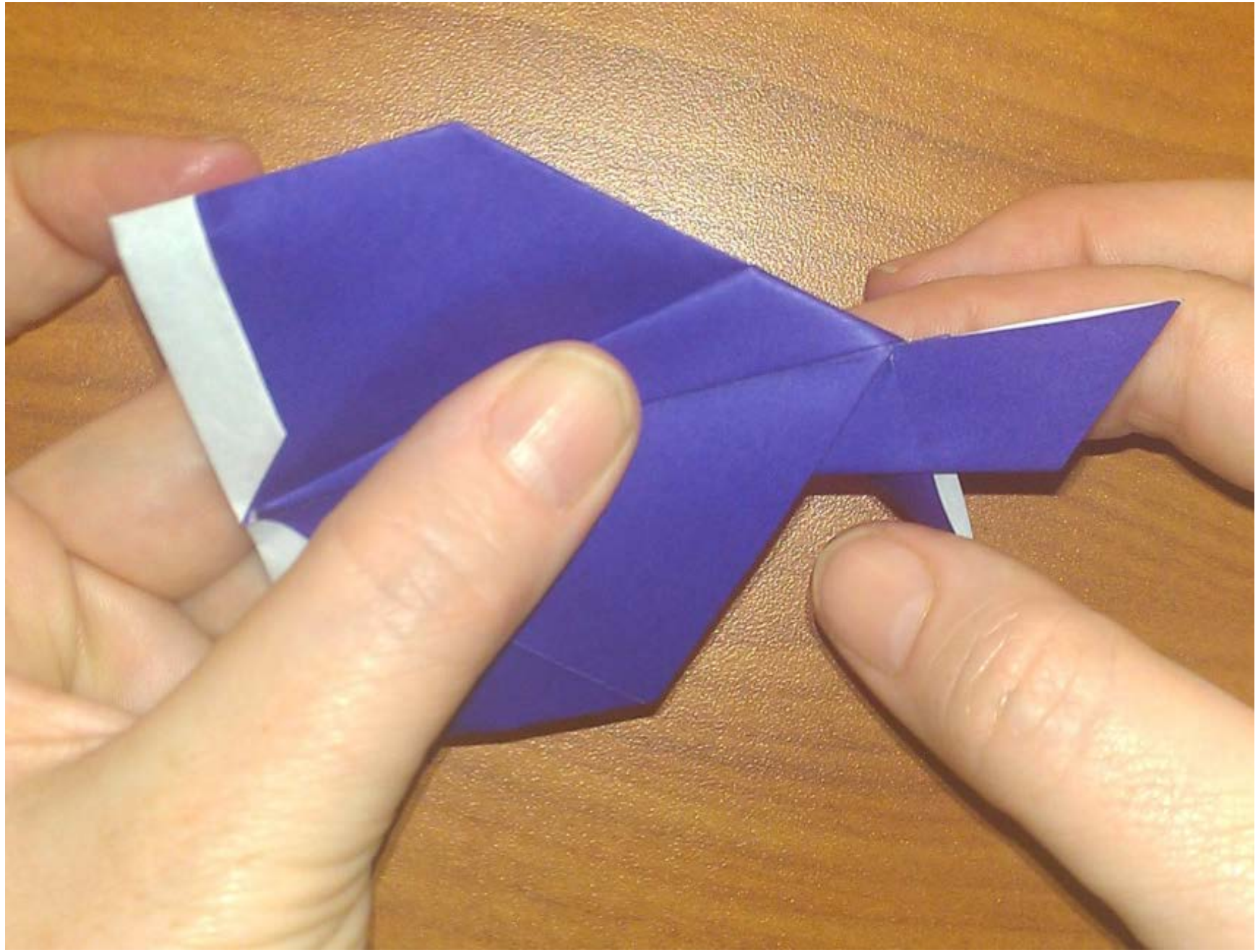


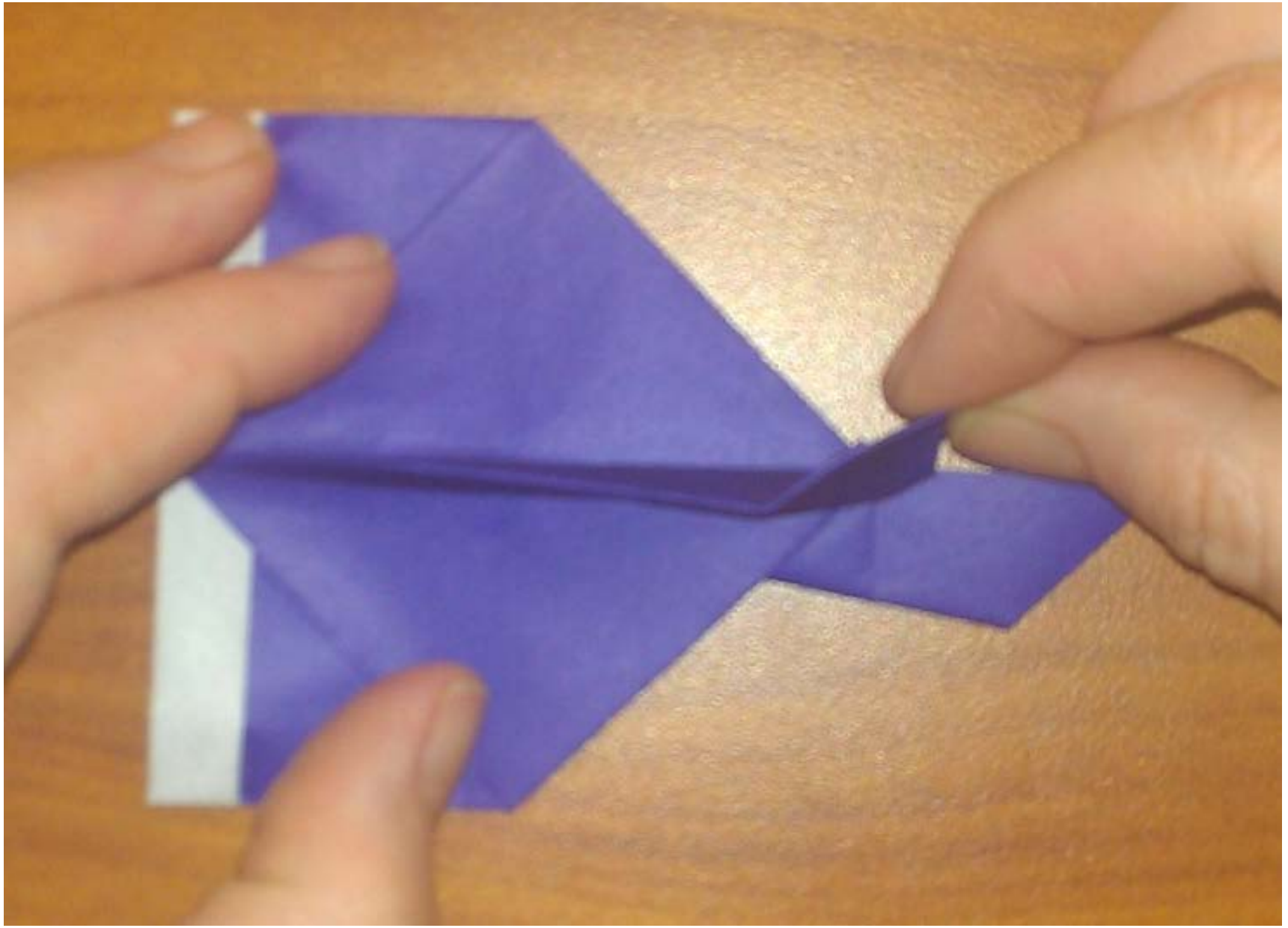


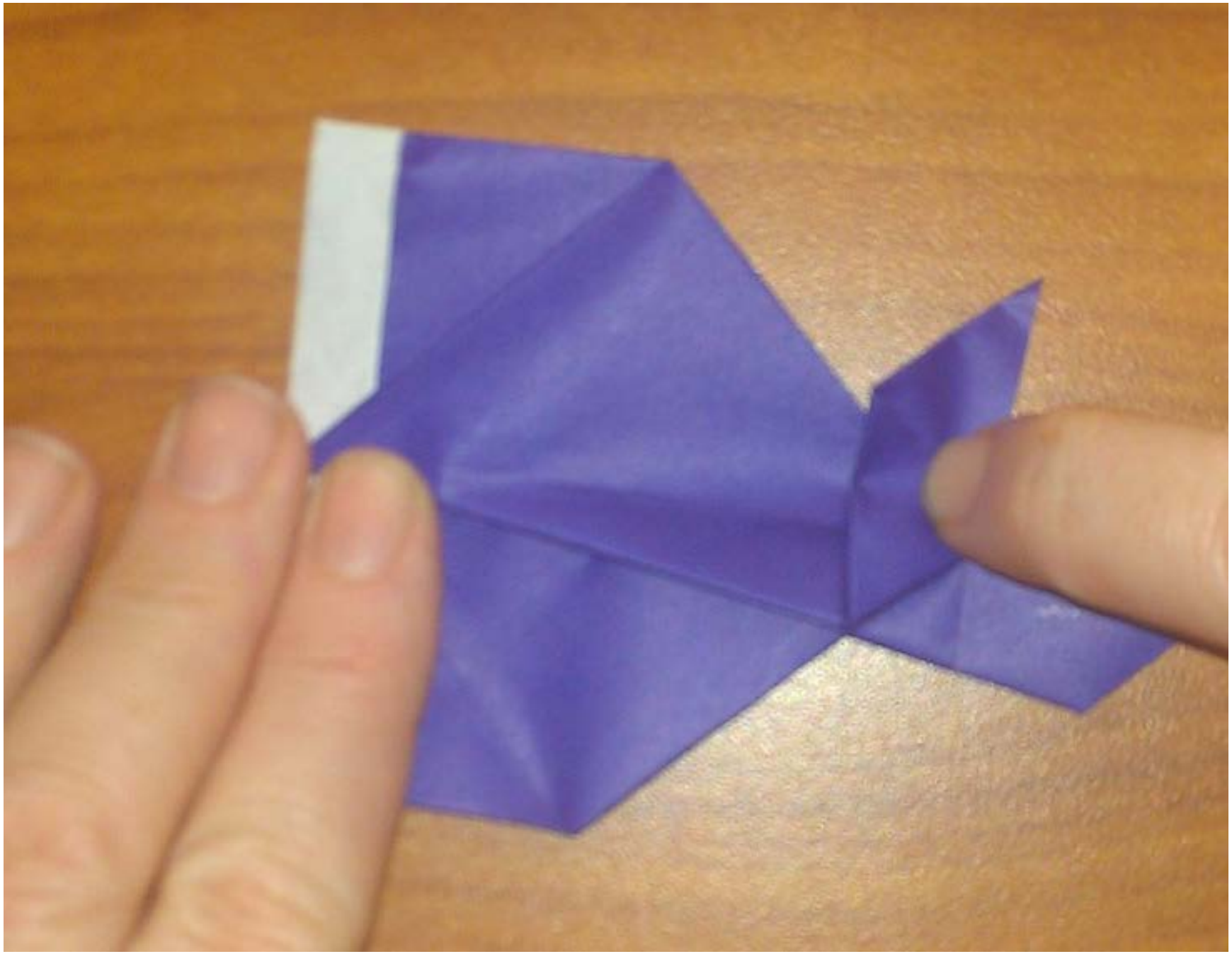


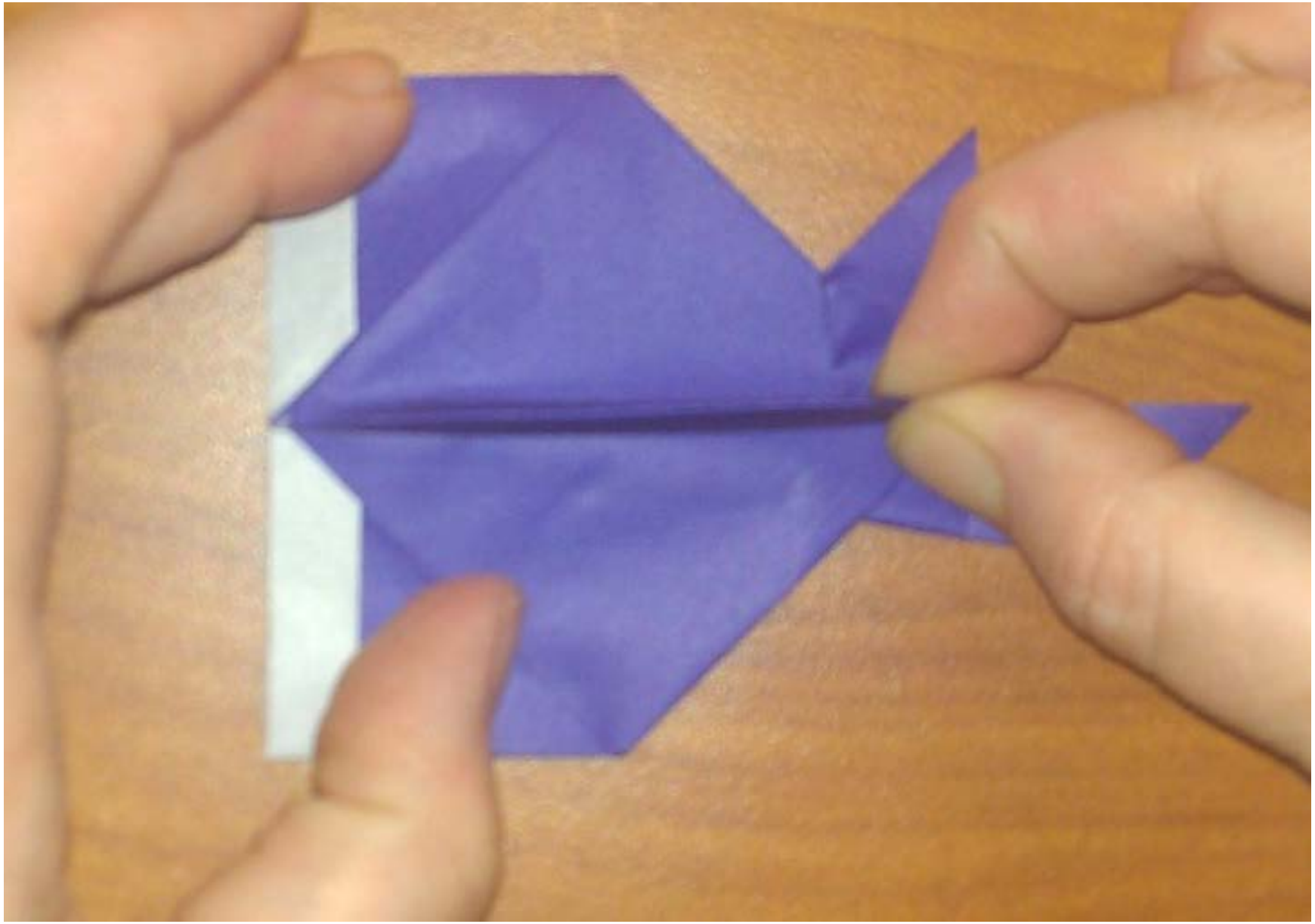


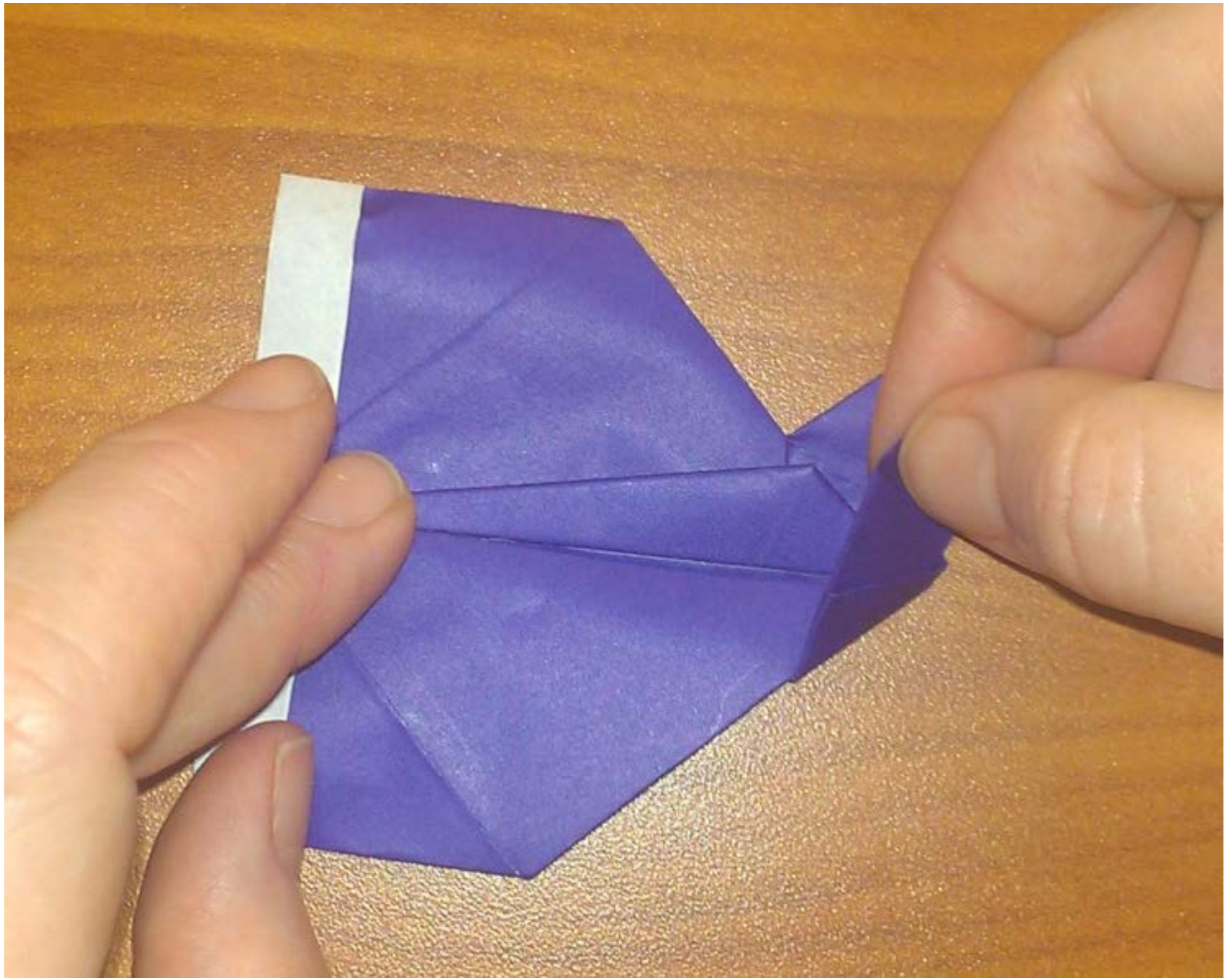


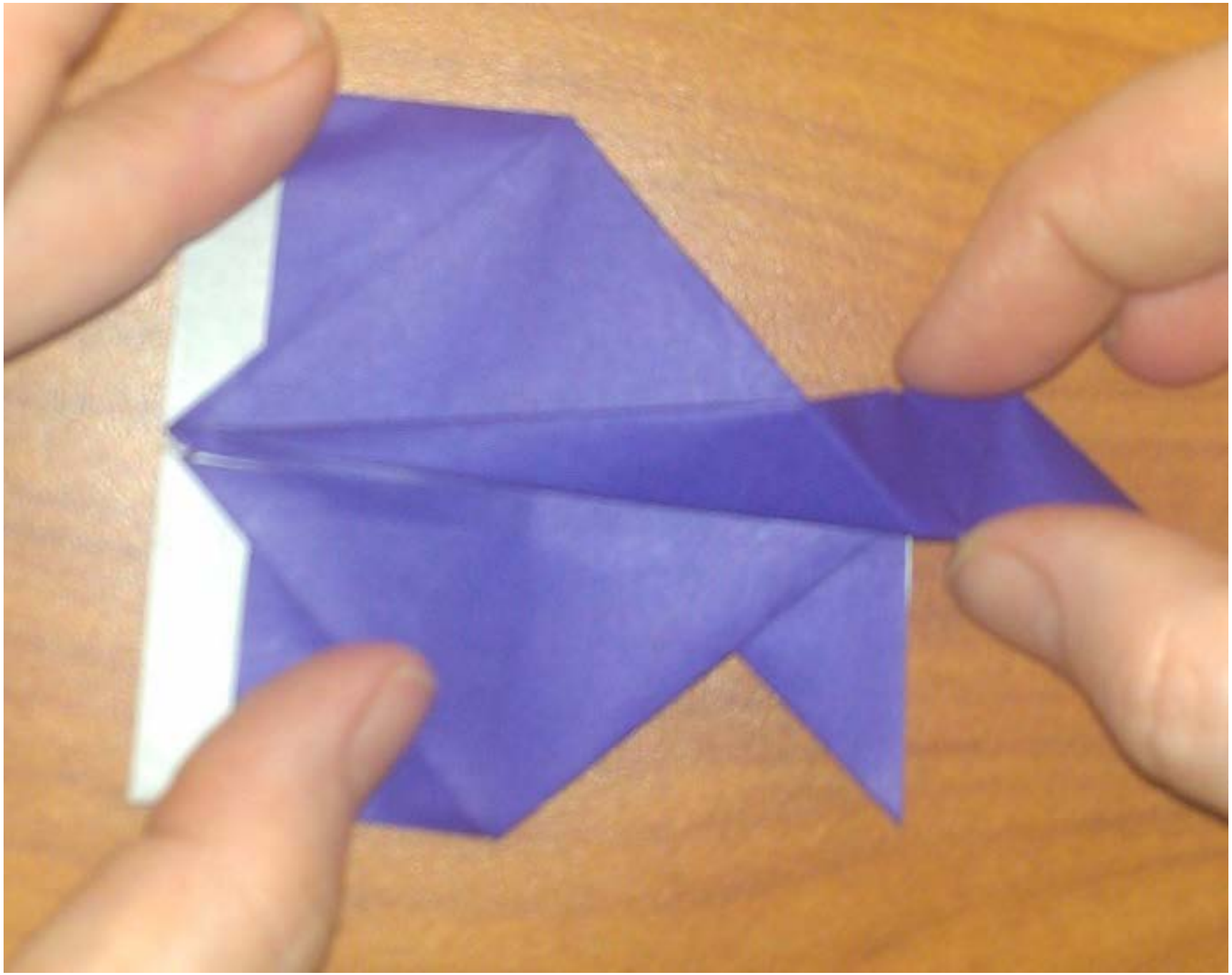


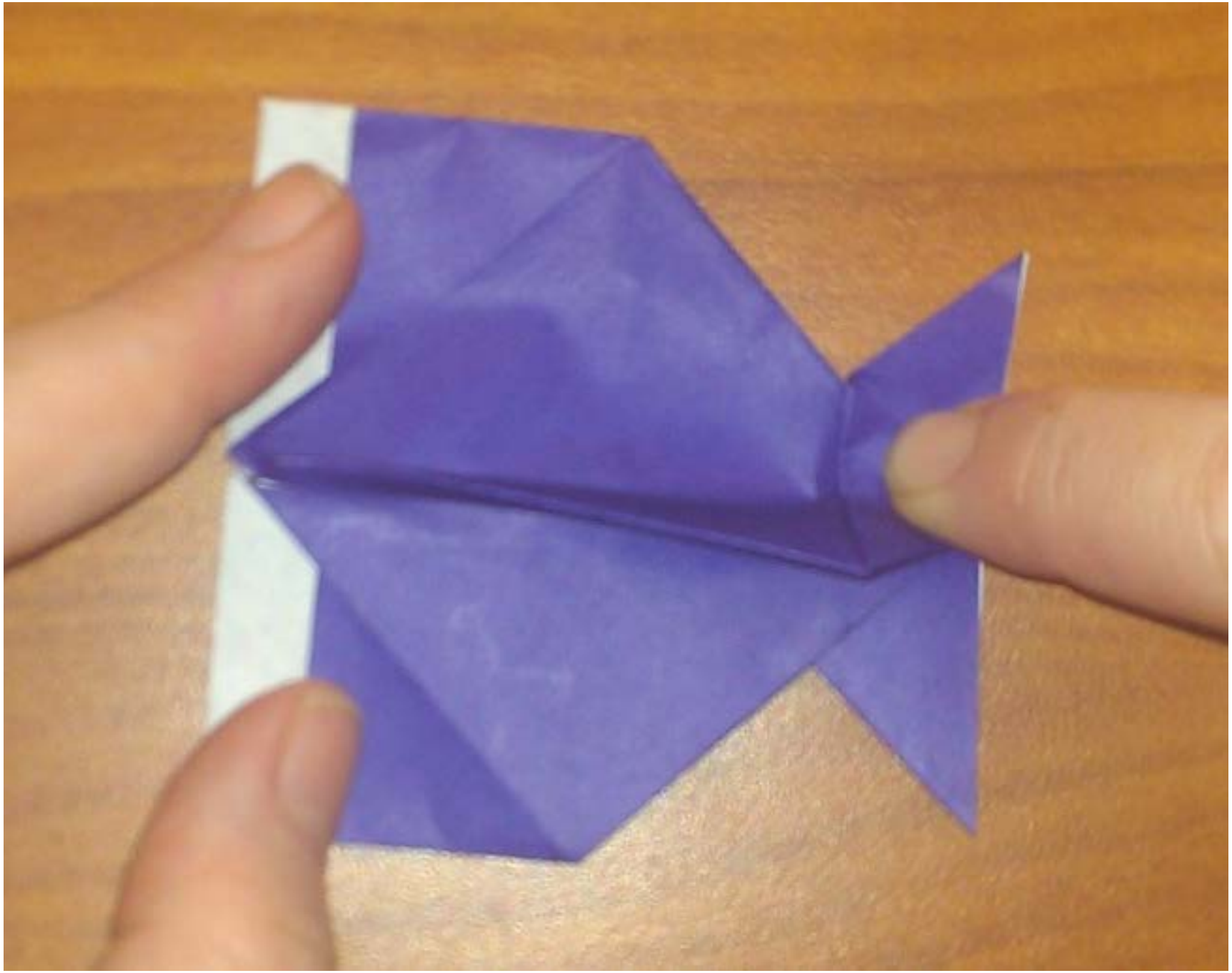


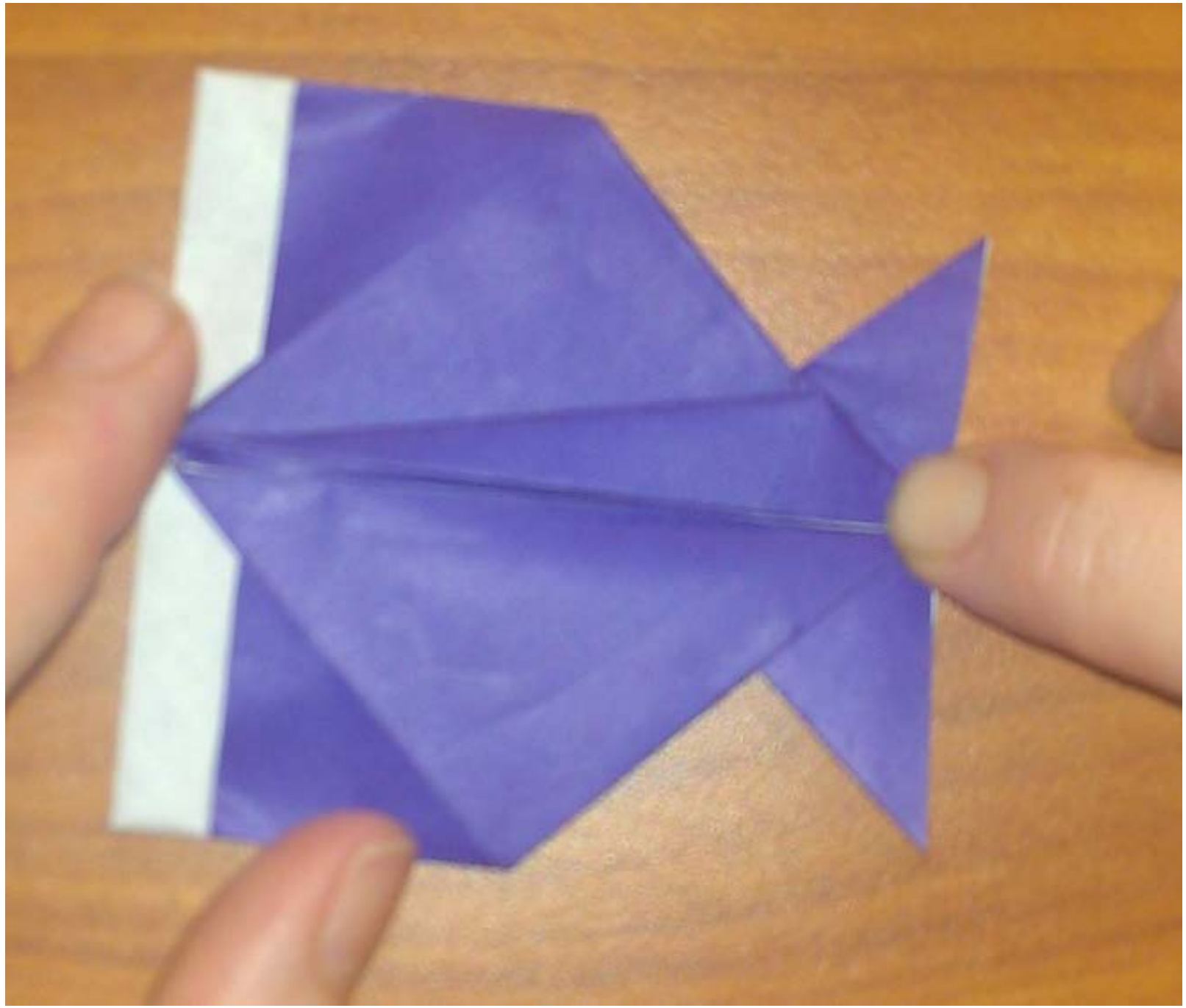


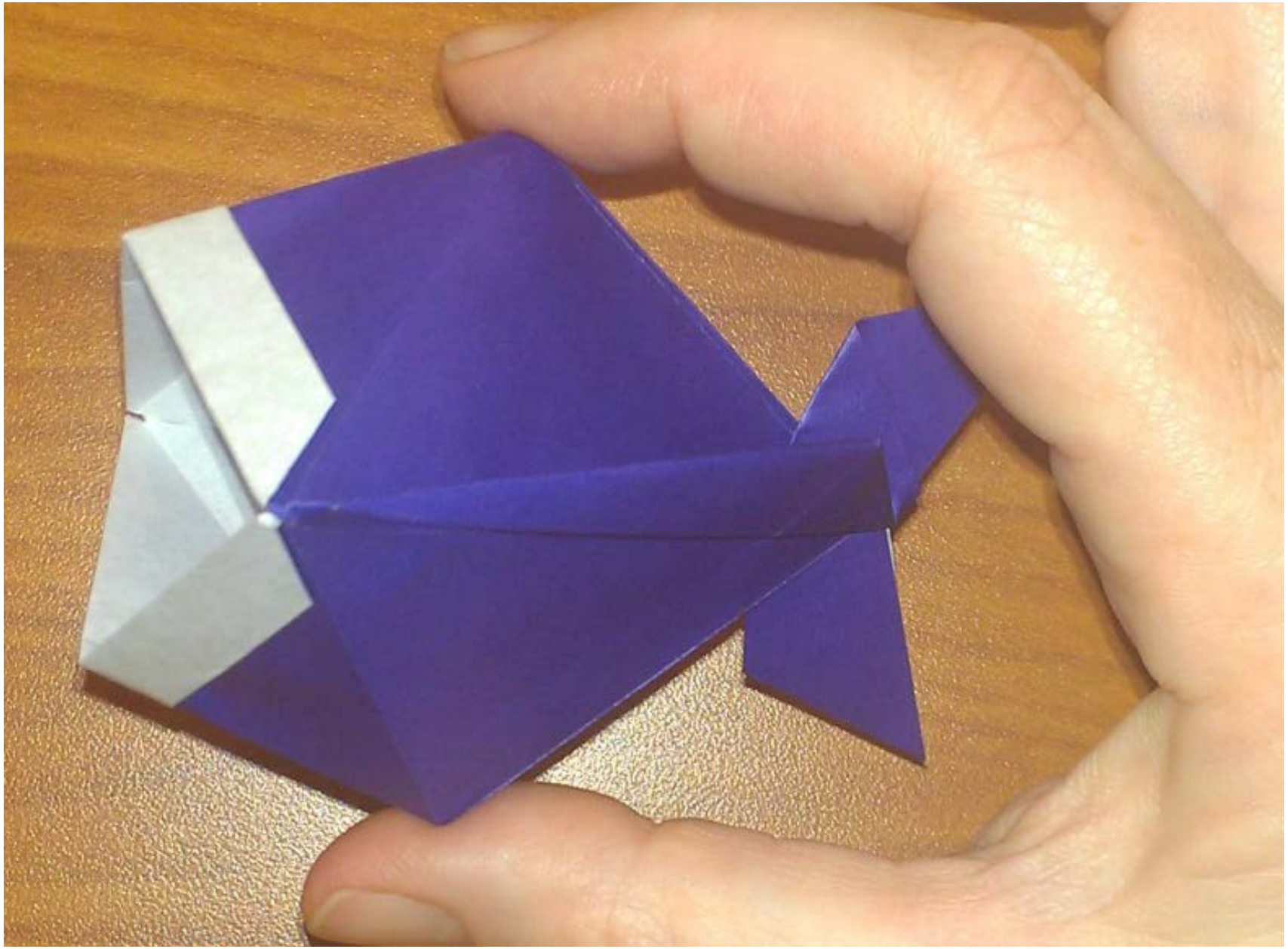




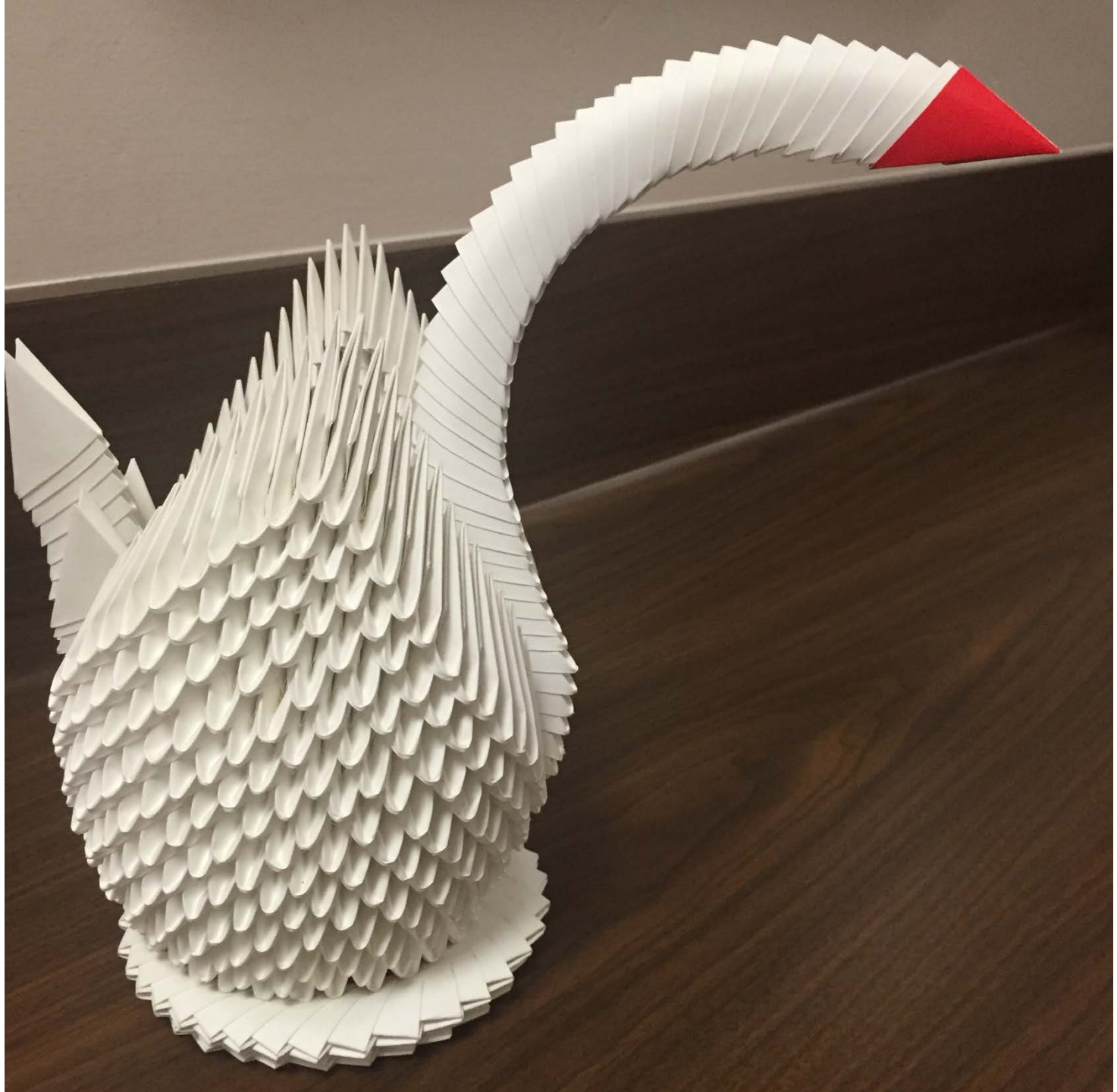








An exploration



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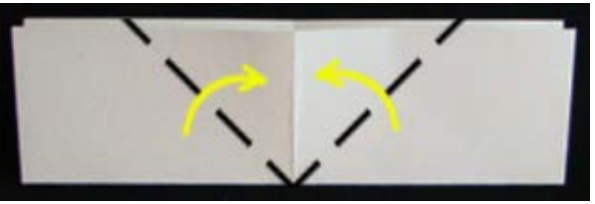

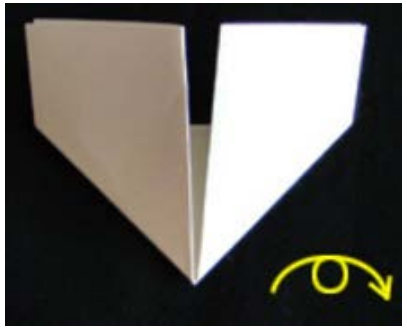

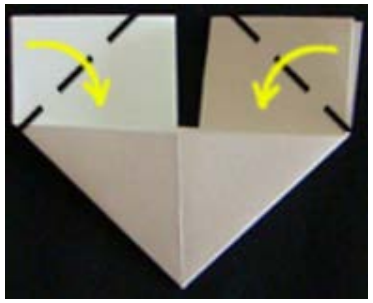

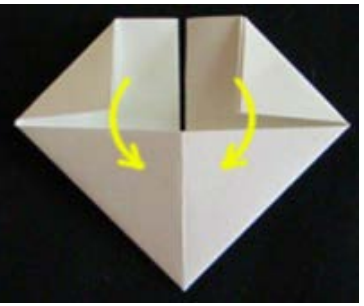

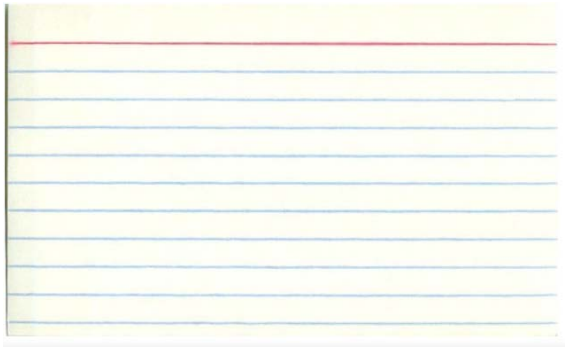

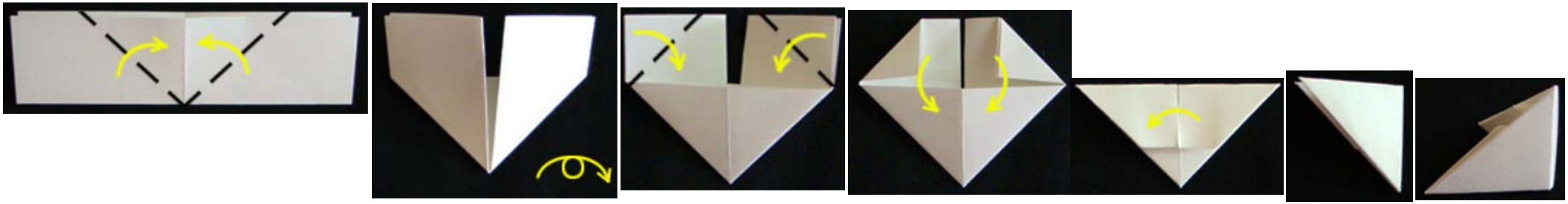

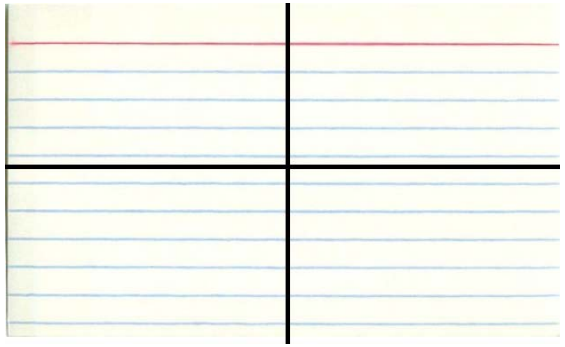

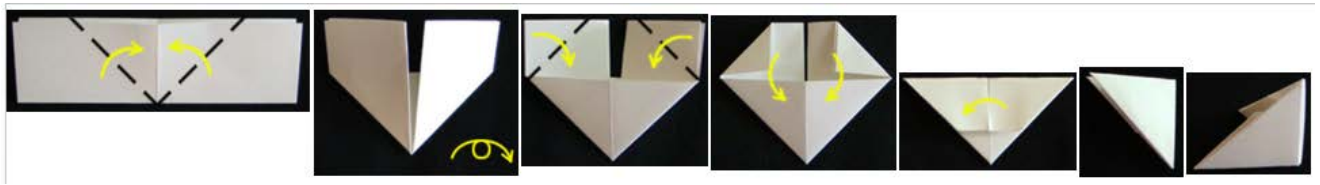

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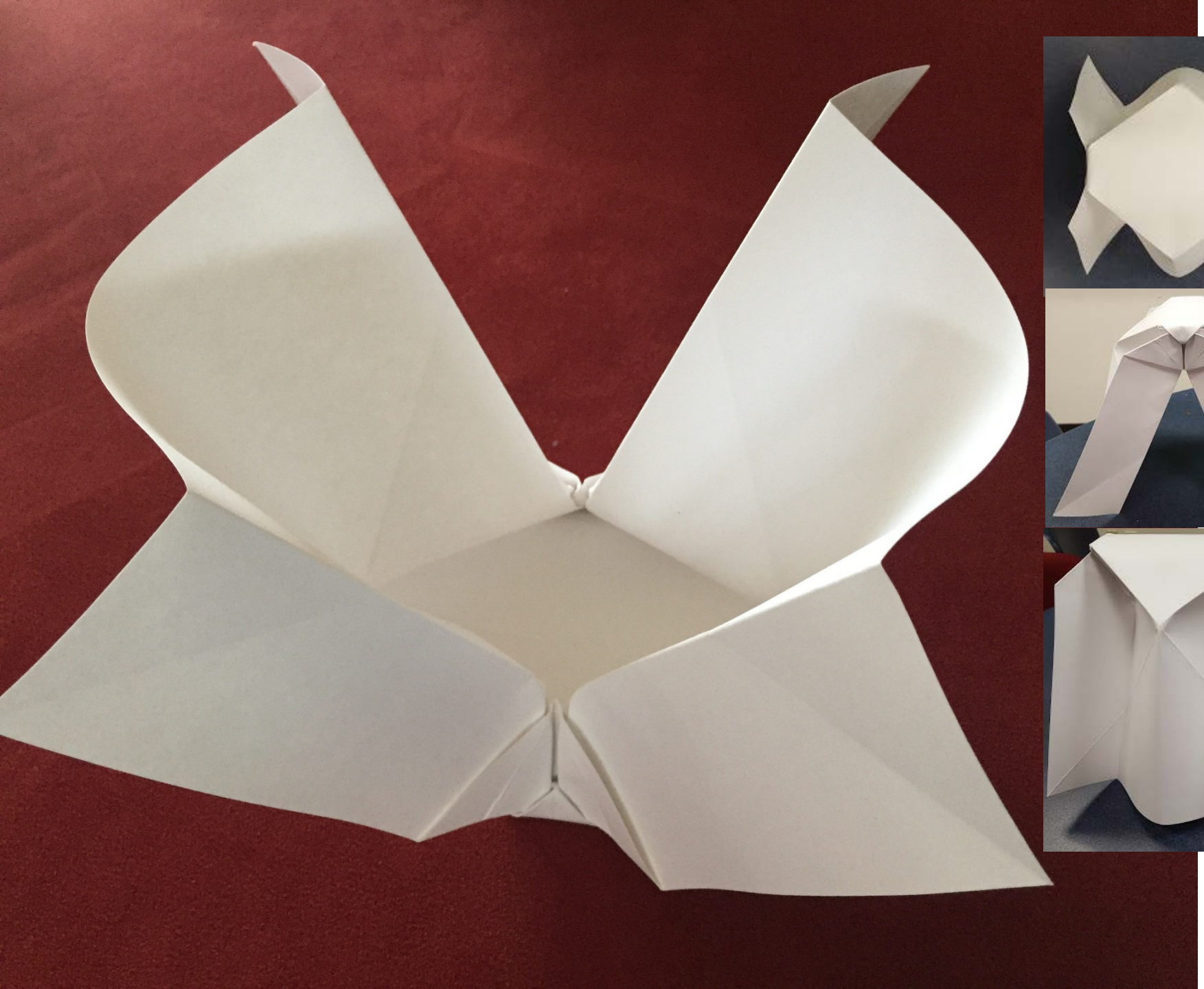

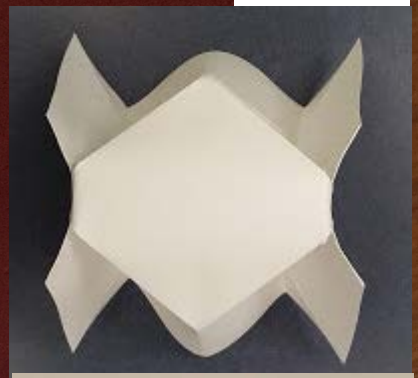

Thank you!

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