

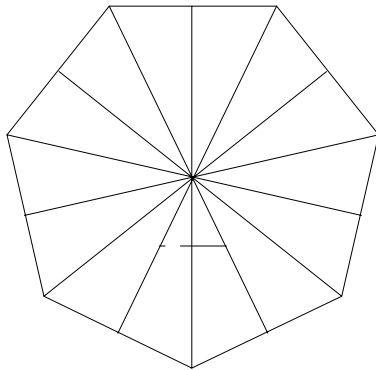
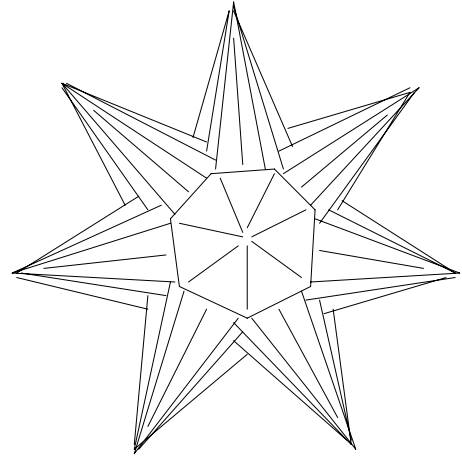
Seven-Pointed Pleated Star

design and diagrams by James M. Clark

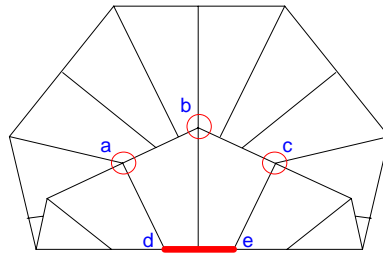
folded from a heptagon (7-sided polygon)

See separate diagrams for constructing a regular heptagon from a square.

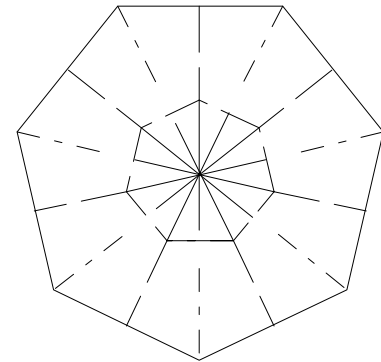
I think that seven-pointed stars are fascinating to look at, because the shape is not as familiar as 5, 6, and 8-pointed stars.



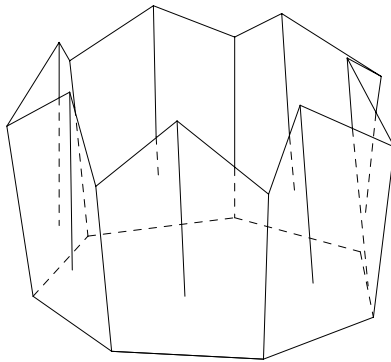
1. Begin with a heptagon, colored side up. Fold the crease shown as explained next.



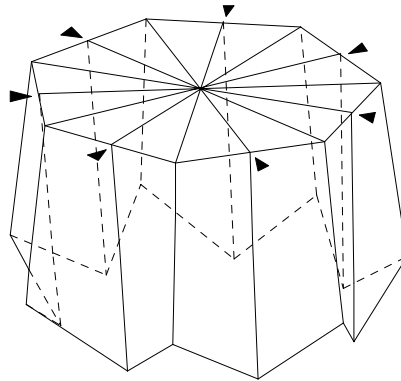
2. Valley-fold up, matching landmarks at **a**, **b**, and **c**, and creasing only between **d** and **e**. Repeat this crease six more times around the heptagon to form a smaller heptagon.



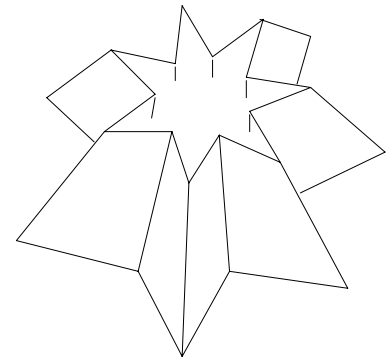
3. Valley-fold the sides up around the smaller heptagon, forming a bowl shape. Mountain- and valley-fold the existing creases on the sides a little. See the next view.



4. Like this. The top edge of the "bowl" should be star-shaped, and the bottom of the "bowl" heptagon-shaped. Turn it up-side-down.

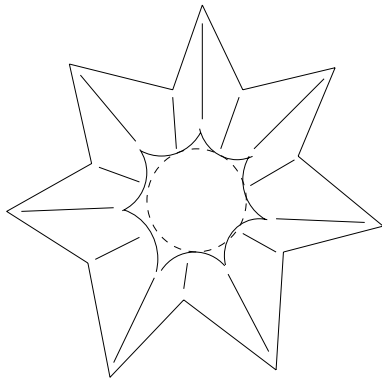


5. Push in the middle of each side of the heptagon "bottom of the bowl". Push only part of the way toward the center. (See next view.)

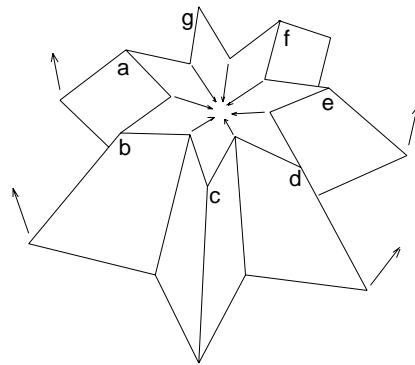


6a. It should look like this. Now peek at the bottom.

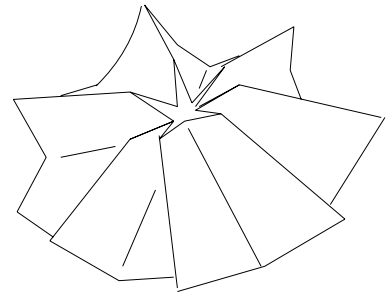
Seven-Pointed Pleated Star



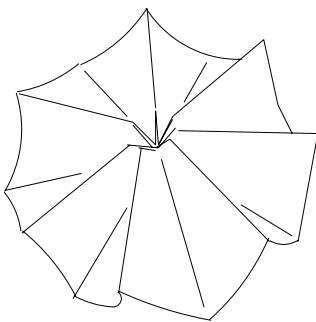
6b. You will see a 'button' beginning to form at the bottom. Be gentle and avoid creasing the sides of the button.



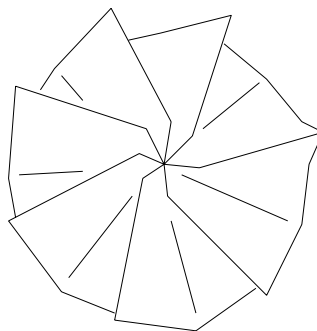
7a. In one slow motion, swing the bottom edges outward and upward while pivoting the inner corners toward the center. Pinch the outer corners **a, b, c, d, e**, etc. to help the inner corners touch at one central point.



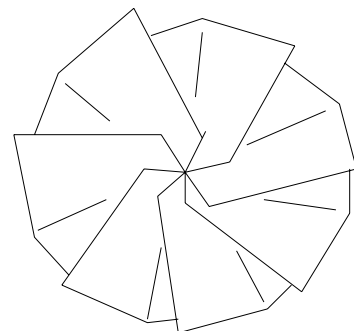
7b. Here, the center is almost closed. Pushing the bottom down on a table top will help at this point.



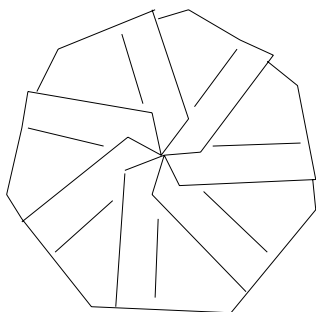
7c. Now the center is closed, and seven 'vanes' (folded edges) radiating from the center stand up, while the rest of the paper is fairly flat.



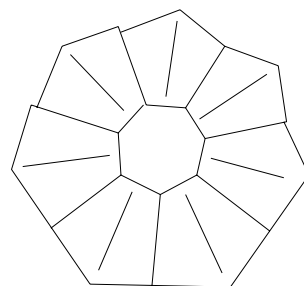
8a. Tilt each of the seven vanes a little to the left (clockwise) like this, pushing only near the center of the paper.



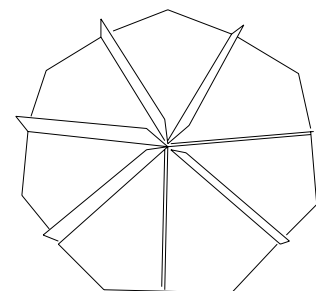
8b. Press all of the vanes down flat at the center of the paper only.



9. Softly flatten the vanes near the outer edges, aligning the outer edges. Check that all sides are identical before creasing harder.

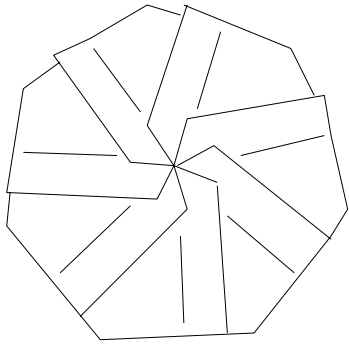


10. Turn over to check the bottom. The button should be flattened into a heptagon. Now turn over again.

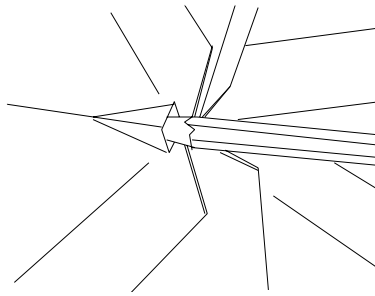


11. Turn all vanes up on edge, softly forming a new crease at the bottom of each vane that matches the previous one.

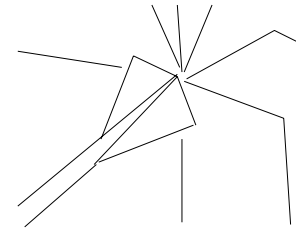
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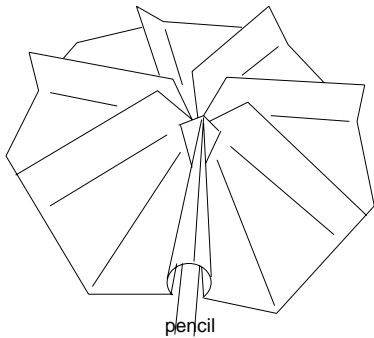
12. Tilt each of the seven vanes to the right (counter-clockwise) like this. Check that all sides are identical before creasing harder.



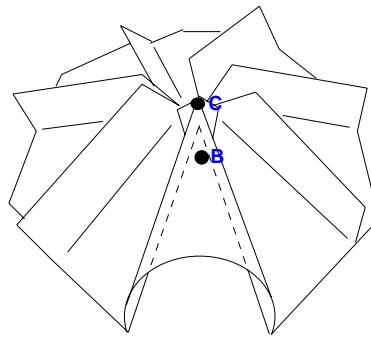
13. Each of the vanes has a pocket at the end that touches the center of the model. Open one of them with a pencil like this.



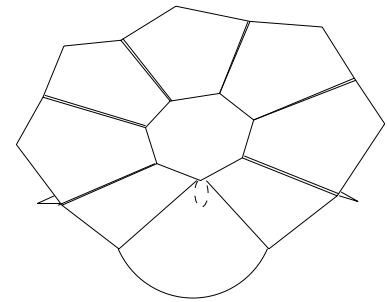
14. Squash the pocket flat on either side of the vane like this. (This makes the other end of the vane tilt up.) You need the reverse the tilt of other vanes to make room for this procedure.



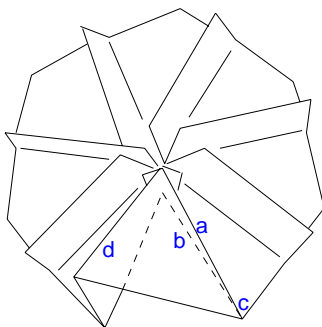
15a. Push a pencil into the longer 'pocket' at the other end of the vane from the small pocket opened and squashed in steps 13 and 14. Open the 'pocket' into a conical shape as shown next.



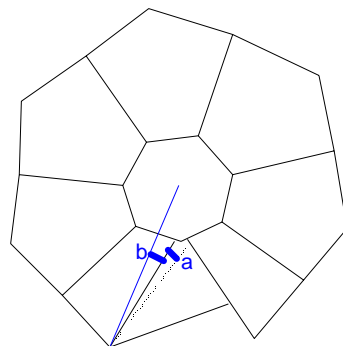
15b. On each side make a valley fold from a corner of the heptagon *toward* the center. From this side it would appear that the new folds meet at the center C, and from the bottom, it would appear that the folds meet at point B, a corner of the button. Actually, the folds meet a point between C and B.



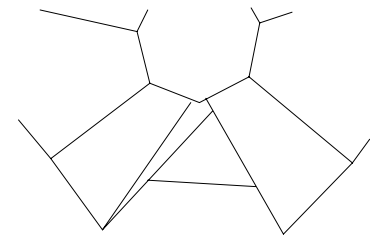
15c. Here's what it looks like from the button side. The point where the new folds meet will be established by opening the 'cone' shape as far as possible.



16. Back to the vane side. Swing the paper as far as it can to the left. Make crease **a** first, then crease **d**. Crease **a** is close to previous crease **b**. Try to be precise at corner **c**.

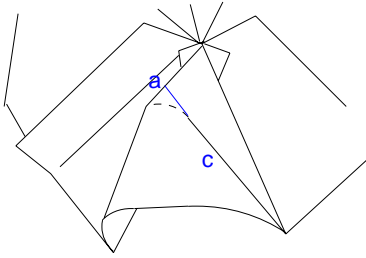


17a. Turn to the button side. Make this mountain fold. Angle **a** should be two-thirds of angle **b**.

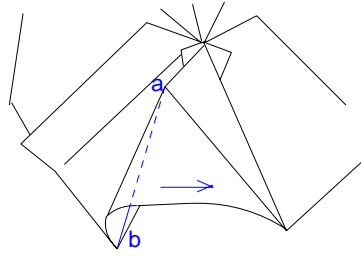


17b. Here's the result seen from the button side.

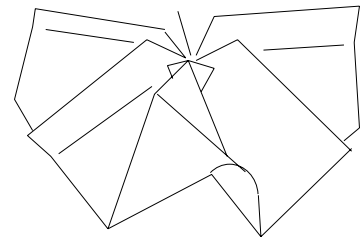
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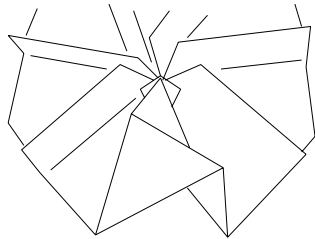
17c. And seen from the vane side. Extend the new crease in a straight line to point a. A pencil-point inside the 'cone' will help.



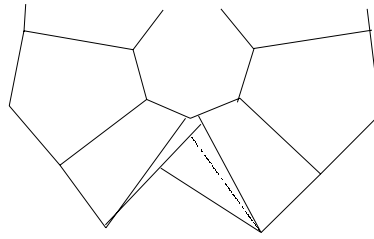
18. Now swing the paper as far as it can to the right, forming a crease from the cone-point **a** to outside corner **b**.



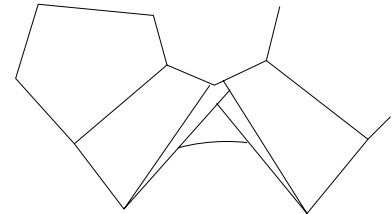
19a. Now flatten the paper on the right.



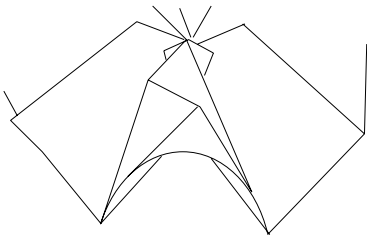
19b. Here's the result. Turn the model over.



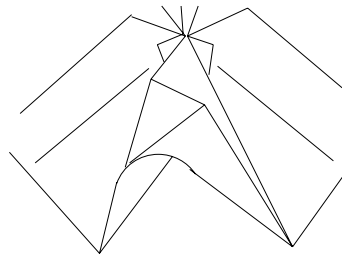
20a. Make a mountain fold with the same angle as step 17.



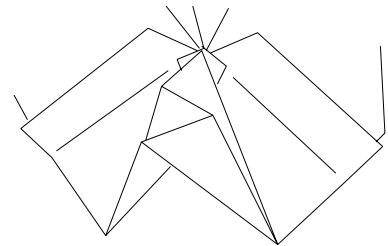
20b. Here's the result. Turn the model over.



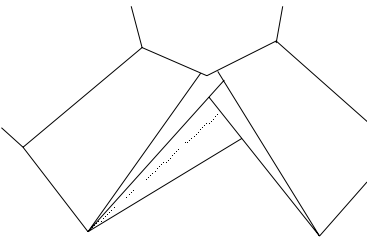
20c. The result seen from the vane side. Check that the 'cone' has a good point.



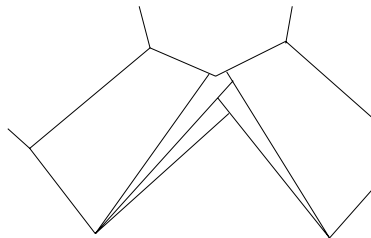
21a. Swing the paper to the left, forming a new crease on the right.



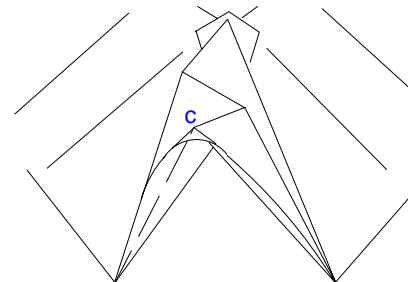
21b. Flatten the paper on the left, then turn the model over.



22a. Make a mountain fold with the same angle as steps 17 and 20.

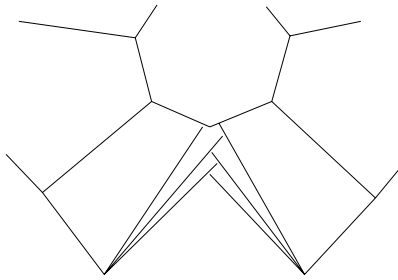


22b. Here's the result. Turn the model over.

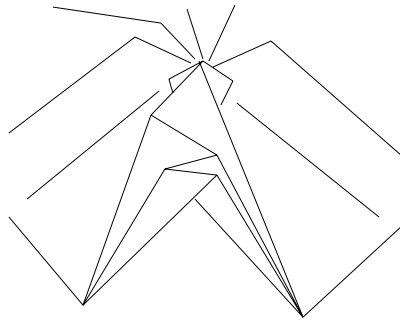


23a. Swing the paper to the right, first making a crease on the left, then on the right, as before. The position of the cone-point **c** may need to be adjusted, so keep the folds soft at first.

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23b. The result seen from the button side. If the last pleats are not equal, shift the cone-point **c** in view 23a.



23c. The result seen from the vane side.

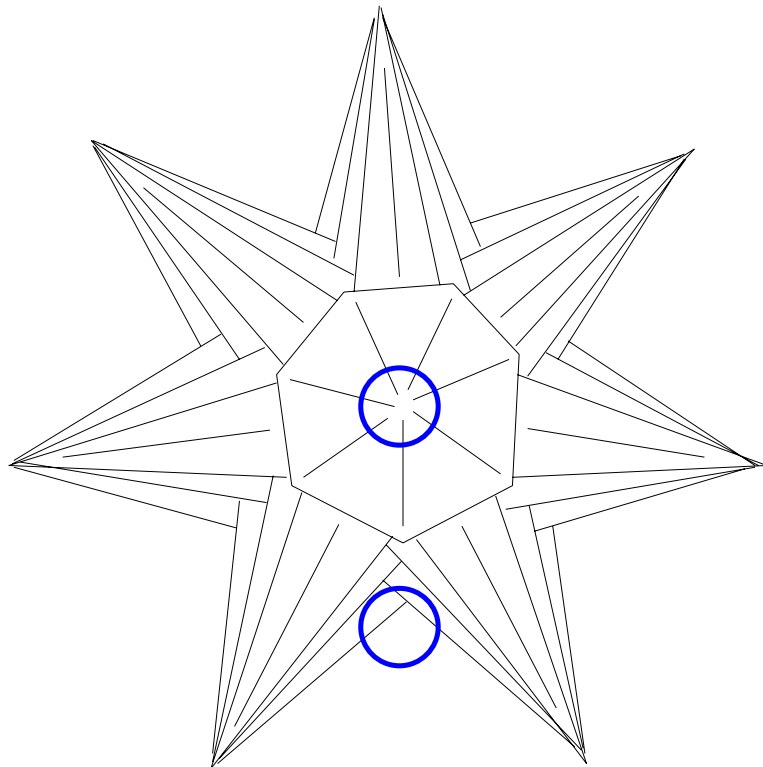
24. Repeat steps 13-23 six more times around the model to complete the star. By pleating seven V-shaped gaps, seven arms of the star are formed.

The button side is the front of the star.

25. To make the star three-dimensional, hold the star at the center with one hand, and at the bottom-most pleats between two arms of the stars (circles represent holding positions) and pull the pleats toward the back. Repeat this procedure around the star.

If the arms of the star tend to angle forward (this may depend on the kind of paper used), you can glue a circle of paper to the center of the back of the star to prevent this.

You can make two of these stars and glue them back-to-back.



If the first star you make is less than satisfactory, try it again.

If you make the first pleats in a gap too wide, you will run out of paper, and the last pleats in the gap will be too narrow, or there will not be enough paper to make them. If you make the first pleats in a gap too narrow, you will have too much paper, and the last pleats in the gap will be too wide, or you will need to make more pleats. Sometimes the extra pleats can be folded out of sight. With practice, you can make the angles more equal.

It is easy to get blunt and fuzzy points at the end of the arms of the star. With practice and extra care, you can make sharper creases here.