LESSON 6: BIRD BASE

Activities

Activity 1: Fold the Bird Base
Activity 2: Fold a Flapping Bird
Activity 3: Fold a Crane

Models for this lesson:

Bird Base, Flapping Bird and Crane

Materials needed:

Square Paper

Targeted grade levels:

Grades: 5,6,7

Math Concepts:

Subset, symmetry, rotation, angle bisector, rhombus

NCTM Standards:

1. make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.
2. precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties
3. understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;
4. develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers;

Math Vocabulary:

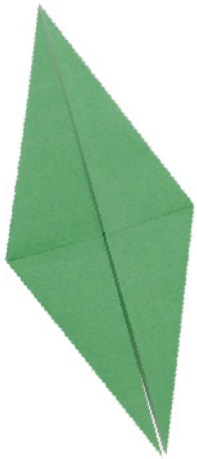
Triangle, angle, bisect, diagonal, intersect, congruent

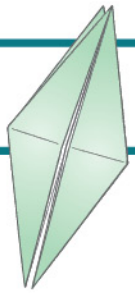
Teaching Tips and Techniques:

- Try to choose models that are relevant to the curriculum whenever possible.
- Focus on innovation and encourage students to create variations on models.
- Especially in higher grades, encourage group activity. Let the students develop projects they can display in school.
- Stringing cranes and other models for displaying in school art shows or on holiday trees is a great way to boost team building and collaboration.

Lesson Introduction

Welcome to Lesson 6! Congratulations on reaching this chapter on the Bird Base. In Lesson 4 we learned the Preliminary Base which is the foundation for the Bird Base. When you have mastered the Bird Base, you have graduated to the next level of folding - from simple to intermediate folding. This base is the starting point for folding many different models including stars, animals, flowers, and, of course, birds. The Bird Base is sometimes referred to as the Crane Base because the crane is probably the best known Origami model created from this base. The petal fold that we learn in the making of the Bird Base is also very useful in several models which are considered to be intermediate level. As you can see, the Bird Base starts out with the Preliminary Base.

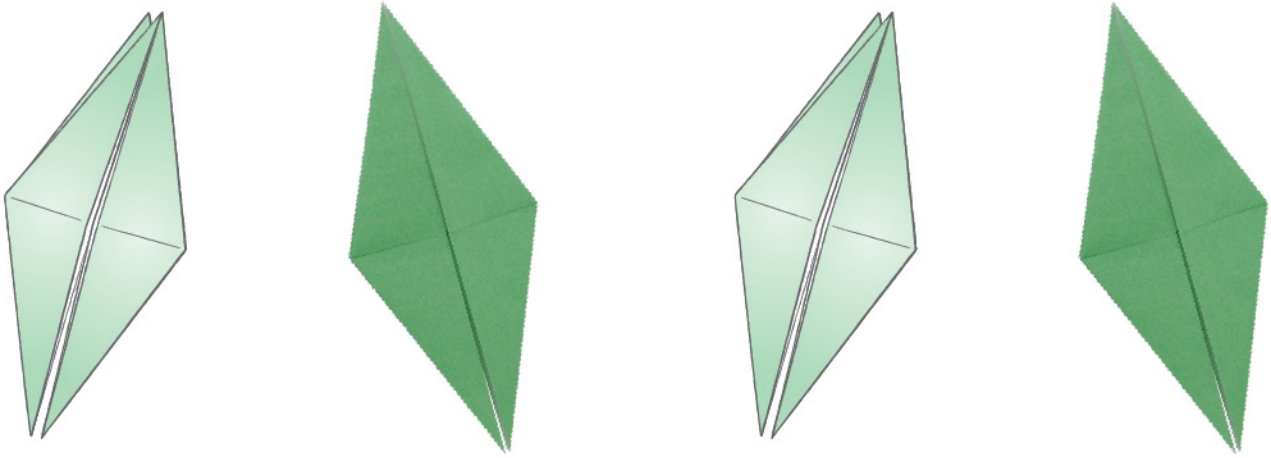




ACTIVITY 1 - *Fold a Bird Base*

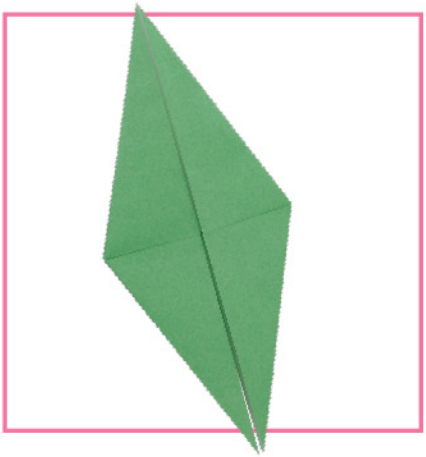
Neatness and precision are key in this model. It will make the layers line up better and also help with initial collapse of the Preliminary Base.

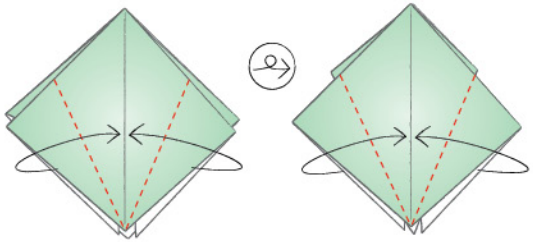
- The first fold is a precrease and also an angle bisector. When making this precrease, make sure you do not overlap the layers/flaps. It might even be helpful to leave a gap between the flaps. This is often referred in origami as fudge factor.
- Step 5 is called a petal fold. This is a very important maneuver and is often used in several models.
- Explore the symmetry of the models before and after the formation of the petals.



BIRD BASE

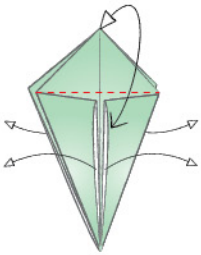
Traditional



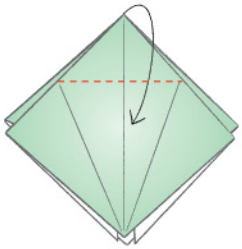


1 Start with a Preliminary Base (Lesson 4), with the closed corner at the top. On the front layer only, fold both side edges to the center line. Be careful to make sharp points at the bottom.

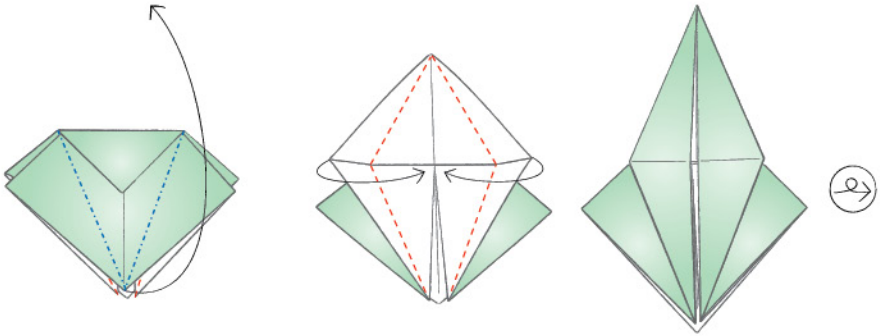
2 Turn over and repeat on the other side.



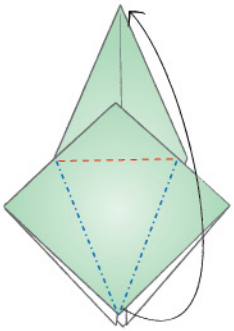
3 Fold the top down, and then unfold back to the Preliminary Base.



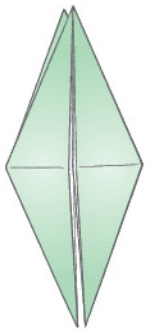
4 Fold the top down along the existing crease.



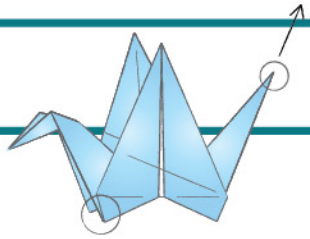
5 Open the top layer by bringing the bottom corner up while holding down the other layers. Collapse along existing creases. Turn over.



6 Fold the top triangle down along the existing crease. Repeat step 5.



Finished Bird Base!

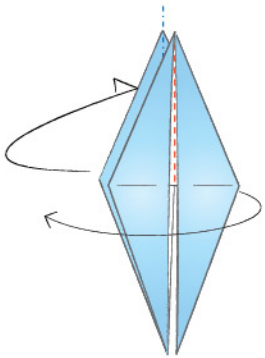


ACTIVITY 2 - *Fold a Flapping Bird*

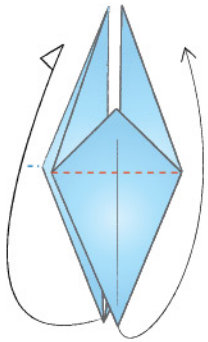
- Make sure you begin with a properly folded Bird Base with no overlapping layers
- When reorienting the layers, make sure there are two flaps on each side. Notice the various triangles forming as all this happens.
- Notice the symmetry elements changing as we move the layers around.
- The exciting part of this model is the flapping action of the wings. If this proves to be troublesome, make sure you've left a gap (fudge factor) when you folded the Bird Base. You can also try to curl the wings forward or change the angle in step 5. Make sure the wings are pointed up and not down.

FLAPPING BIRD

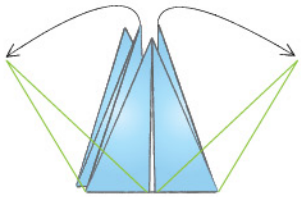
Traditional



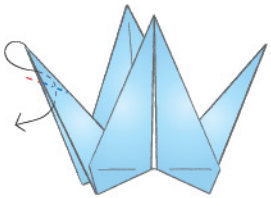
1 Start with a Bird Base. On the top layer turn the right flap over to the left. On the back layer turn the left layer over to the right.



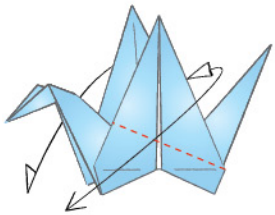
2 Fold up front flap on existing crease line. Repeat on back layer.



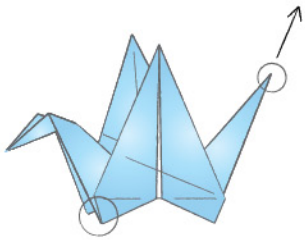
3 Pull out inner points and flatten at the base.



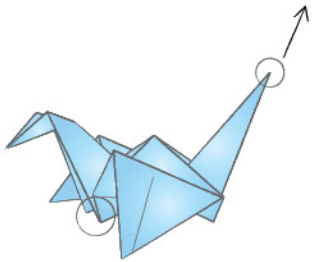
4 Form the head by partially opening and pulling the tip down. Pinch the head closed.



5 Fold the front wing down forming a crease from the base of the wing to a point that meets the neck. Fold wing on back to match. Unfold.



Finished Flapping Bird!



Hold the model at the bottom of the neck and gently pull on tail to make the bird flap.

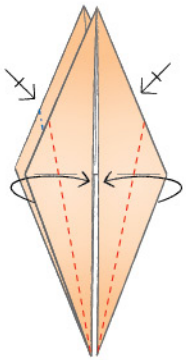
ACTIVITY 3 - *Fold a Crane*

- This Crane is often called a peace crane and is one of the most folded and widely recognized model in Origami.
- While narrowing the bottom portion of the model in step 1, make sure you do not lose your sense of orientation and that the flaps in the bottom are split. This is another angle bisector.
- Explore the various types of triangles and other shapes which are being formed at various stages. Which of these triangles are congruent? Explain.

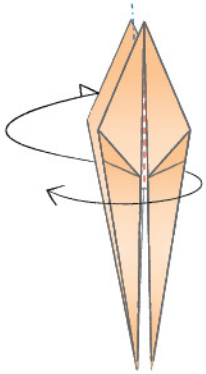


CRANE

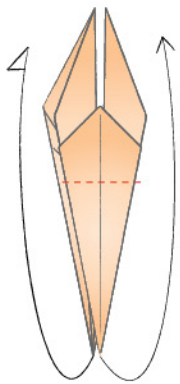
Traditional



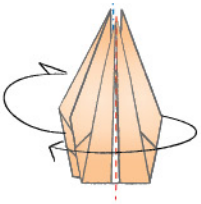
1 Start with a Bird Base. On the top layer fold both side edges to the center. Repeat on back layer.



2 On the front layer turn the right flap over to the left. On the back layer turn the left flap over to the right.



3 Fold the bottom point up along existing crease. Repeat on the back.



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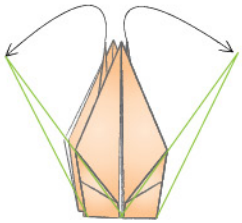
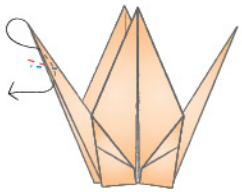


5 Pull the inner points out to line up as shown and flatten at the base.



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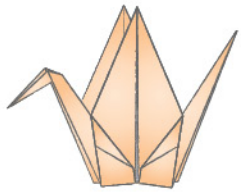
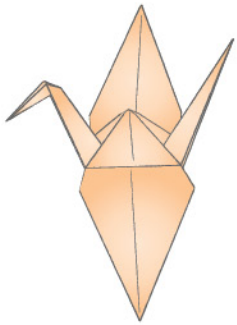


7 Finished Crane!



You can open the Crane by holding each wing close to the body of the Crane and pulling gently.