

## Origami Bonsai® Instant Flowers Math Lesson Plan for Grades 2 through 8

Time: 20 to 60 minutes

Goal: Introduce students to the triangle with a hands-on, interactive lesson which provides a unique, application-driven opportunity for teachable moments.

Materials: Four plastic straws per student/group, one Origami Bonsai® Instant Flower per student/group, and one print out of the Origami Bonsai® Instant Flower folding diagram per student/group. One unfolded Origami Bonsai® Instant Flower.

Description: Hand out four plastic straws to each student/group. Ask them to assemble a four-sided polygon by compressing the ends, and inserting them into each other. Students may use all four straws to create their four-sided polygon, or use only two or three by folding one or more straws.

Once students have completed their four sided polygon, direct them to “stand it up,” and hold one side flat against the surface of their desk. Direct them to hold the bottom straw while moving the top straw horizontally, in line with the assembly (in the same plane). Ask them if the shape “sways”, or “do the two sides of the polygon move?” They should be able to create and see movement.

Now ask the students to remove one side of their square and reconnect the straws to form a triangle. Direct them to hold one side of the triangle flat against the surface of their desk and try to make the point at the top move in a direction parallel to the bottom of the triangle (in the same plane). They should see no movement.

Explain that the triangle is the strongest shape known to man. That because a triangle has three sides, its corners cannot move within their plane. Next, talk about the pyramids, and their triangular shape, and how long ago they were built. Ask students to find triangles around the classroom. Ask students to name common triangles they have seen.

Collect the straws.

Pass out the Origami Bonsai® Instant Flower folding diagrams. Ask students to fold the paper in half width-wise. Direct students to stand the sheet of paper on their desks. Do the folded sheets support their own weight? If so, how much pressure can students apply?

Pass out the Origami Bonsai® Instant Flowers. Open them in the “Instant Flower” pattern. Ask students to place the flower on their desk, with the petals facing down and the bud facing up. Tell students that they’re not interested in destroying the flower, just to see when it begins to flex. Direct students to put their hand on top of the tip of the bud and apply pressure towards the desk. How much pressure can they apply?

How is it possible that one piece of paper can support a lot of weight, and another supports so little? The answer is triangles. The Origami Bonsai® Instant Flower is made up of many triangles. These triangles work together to support the weight of their hand. The instant flower can support thousands of times its own weight.

Ask them to open the Origami Bonsai® Instant Flower folding diagram. Hand out the unfolded Origami Bonsai® Instant Flower and ask students to compare it to the folding diagram and then pass it to the next student/group. The diagram corresponds to one petal of the flower. They should see the relationship, if not, point it out to them.

If there is extra time, direct them to find, and define all the triangles on the Origami Bonsai® Instant Flower folding diagram. Students should count and compare their results, and justify their answers.

If there is more extra time, and there's a computer in your classroom, students can go to [www.YouTube.com/InstaFlor](http://www.YouTube.com/InstaFlor) and fold other flowers.

# Origami Bonsai® Instant Flower Folding Diagram

Patent Pending – Benjamin John Coleman

[www.OrigamiBonsai.org](http://www.OrigamiBonsai.org)

## One Petal of a Four-Petal Flower



