

GEOMETRY

Unit Five Project: “Applying Triangle Theory”

OBJECTIVES:

- ✓ Measure with a ruler and a protractor.
- ✓ Identify parts and other properties of a triangle.
- ✓ Use basic geometric principles and tools to create them.
- ✓ Create special segments in an acute triangle.
- ✓ Follow directions to create a unique item.
- ✓ Show creativity in design.

In this unit, you will be spending time applying what you know about Geometry thus far to triangles. The triangle is the foundational shape in Geometry. All other shapes can be formed using a triangle. Thus the principles of a triangle are very important. Its applications are numerous. This project will allow you to use some of the skills you will be exploring in this unit to create a triangular top. Throughout the unit, you will experience everything you need to learn to complete this project. **This project is worth 50 points, will be scored using the rubric that follows, and is due the day before the unit five exam.**

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You will be handing in a triangular top designed and created by you plus the answers to the question sheet!!!

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CREATING YOUR OWN TOY...THE TOP

DETAILS, DETAILS, DETAILS...

The top will be completed on a set day in class; therefore, the first set of directions listed will need to be done prior to that date.

1. Using a piece of oak tag (provided), create a triangle with sides measuring 8”, $6\frac{1}{2}$ ” and $5\frac{3}{16}$ ”. Cut it out! Don’t bend it!!!
2. With this triangle, you will be creating a top. The top will spin so next you need to create a fun design that has a great effect as the top spins. After viewing some of the designs shown in class, create your own design using various colors or shadings on ONE SIDE of your triangle created.
3. On the blank side of your triangle (the other side should have been decorated by you), create the three medians of the triangle. USE A COLORED PENCIL (red if available) AND SOLID SEGMENTS. Use centimeters as you measure. Then clearly mark the intersection of the medians (centroid).
4. Continuing on the same side of the triangle, create the three altitudes of the triangle. USE A REGULAR PENCIL OR A DARK COLORED PENCIL AND SOLID SEGMENTS. Use centimeters as you measure. Then clearly mark the intersection of the altitudes (orthocenter).
5. Continuing on the same side of the triangle, create the three perpendicular bisectors of the triangle. USE A REGULAR PENCIL OR A DARK COLORED PENCIL AND DASHED SEGMENTS. Use centimeters as you measure. Then clearly mark the intersection of perpendicular bisectors (circumcenter).
6. Create the Euler “line” between the three points. USE A COLORED PENCIL (red if available) AND A DASHED SEGMENT.
7. Place your name and date somewhere on the side of the triangle where you have created all of your segments.

*****DO NOT ERASE YOUR MARKINGS!!!*****



ANSWER THE QUESTIONS ON THE BACK OF THIS SHEET ABOUT WHAT YOU HAVE DONE TO THIS POINT! BRING THIS SHEET AND YOUR TRIANGLE DESIGNED WITH ALL MARKINGS ON IT TO CLASS ON THE DESIGNATED DAY TO COMPLETE YOUR TOP!

UNIT FIVE PROJECT
"Triangles and Tops"

1. Give your triangle a name using three letters. Δ _____
2. Name the three vertices of your triangle.
3. Name the sides of your triangle.
4. What is the degree measure of the three angles formed in your triangle?
 - a. $m\angle$ ___ = _____
 - b. $m\angle$ ___ = _____
 - c. $m\angle$ ___ = _____
5. What is true about the sum of the angles in your triangle?
6. What is the difference between a median and an altitude?
7. What is a similarity between an altitude and a perpendicular bisector?
8. Give one geometric word that best describes the relationship between the circumcenter, the orthocenter, and the centroid.
9. What is the least number of triangles that would need to be placed together without overlapping to make a five-sided figure called a pentagon?
10. What type of triangle did you create? (CIRCLE ALL THAT APPLY)

Acute	Right	Obtuse	Equilateral
Equiangular	Scalene	Isosceles	

Your project will be scored based on the answers to the above 10 questions, the triangle's measurements, the accuracy of the medians, altitudes, and perpendicular bisectors and the points created, the accuracy of the Euler line, the art effect, the top should spin and balance, and the overall neatness and accuracy of your creation.

FINISHING YOUR OWN TOY...THE TOP

1. With your completed and designed triangle in hand, you will be placing a hole in one of the intersecting points (centroid, orthocenter, or circumcenter). One of the three intersecting points (centroid, orthocenter, or circumcenter) represents the exact center of mass. If you can determine which point is the center of mass, you will have made a top that will spin. Place a hole in the point that you believe is the center of mass and thus the center of gravity of the triangle.
2. Pick up a wooden stick and place your triangle through the hole made (design side up). If your top spins and balances, great, you picked the right point and did the project correctly. If it doesn't spin and balance, then you picked the wrong point OR your points are incorrect.
3. When you have found the correct point out of the three that makes your top spin and balance, hot glue the stick in.
4. Practice spinning your top!
5. You will be handing in your top and the answers to the questions on the back of the unit five project sheet.

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