Famous Mathematicians Unit

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Date of Lesson: N/A
Length of Lesson: 6 Fifty minute class periods
Lesson Topic: These lessons are to be taught at the beginning of concepts which directly relate to a famous mathematician.
Grade Level: 6-12

Concept(s): At the beginning of each unit a teacher should depend quality time discussing where the concepts originated from, *who created them* and what where they used for long ago. Not all students enjoy mathematics, some prefer English and history class over the more scientific, analytical subjects; by spending a day or two at the beginning of each new concept explaining the history behind it a teacher is more likely to pique the interest of that otherwise disengaged humanities student. Providing students with meaning behind what they are doing makes it more meaningful for them. This bank of lessons provides mathematics teachers from all grade levels a source to implement the historical aspect in their teachings.

Materials List & Advanced Preparations:

Pascal – Class set of laptops/desktops Euclid – Class set of laptops/desktops Fermat - Class set of laptops/desktops Pythagoras - Class set of laptops/desktops Archimedes – Class set of laptops/desktops Newton – Class set of "Newton's 3 Laws" worksheet

Performance Objectives:

Students will be able to: -Explain the history behind their mathematics and the men how developed it.

Safety Considerations:

The only safety concern is that students are on the correct website and not anything questionable.

Blaise Pascal:

Pascal studied Probability Theory as well as Projected Geometry (a non-metrical form of Geometry). This lesson on Probability Theory could be used in a Probability or Statistics course.

Begin the period with asking the students what they know about Pascal. Who is he? Where is he from? What did he do? Where/when have you heard of him? Share the information as a class.

Brainstorm with one another and come up with what you think you know about Pascal and list it on the board.

Then have the students explore online information they can find on Pascal. After twenty minutes of exploring students are to meet with their group members to share any new information they have found. Then as a class each group will share two items with the class.

For homework challenge the students to figure out a pattern to Pascal's triangle besides adding the two above numbers. (Without referencing any aids.)

Pierre de Fermat:

Fermat primarily studied Analytic Geometry, coordinate system geometry, and Number Theory. In teaching number theory concepts, say perfect numbers for instance, the teacher should discuss who Fermat is. Ask the class if they have heard from him before and if so where/when.

Then have the students explore online information they can find on Fermat. After twenty minutes of exploring students are to meet with their group members to share any new information they have found. Then as a class each group will share two items with the class.

For homework provide the students with a list of perfect numbers and ask them to come up with the pattern/rule for the numbers without referencing any aids.

Euclid:

Euclid created what is known as today as Euclidean Geometry, conic sections, spherical sections and parts of number theory. To teach a section on conic sections the teacher can begin with this lesson coving Euclid and then follow up that discussion with exploring what conic sections are and how they work with an interactive link below.

http://illuminations.nctm.org/ActivityDetail.aspx?id=195

Following the link, the class should discuss what they found and what they understand about conic sections.

http://illuminations.nctm.org/Lessons/CuttingConics/CuttingConics-AS.pdf

For homework students are to bring in an object that they can discuss the conic sections of in class. (Think of a squash, if cut at the top it will look differently than when cut at the middle or the bottom.) Students are to then exchange items, on the next day in class, and draw how they think the conic section will appear.

Pythagoras:

It is well known that Pythagoras is credited with developing the Pythagorean Theorem, but how much do we know about this genius of a man? Since your students will think that they already

know everything there is to know about the Pythagorean Theorem you should ask them, without mentioning the theorem, the scenario in the below link.

<u>http://www.cut-the-knot.org/pythagoras/index.shtml</u> Then as a class discussion why the students chose the squares(s) they did and what the answer truly is.

So they students understand the theorem, but do they know the man? Pass out copies of the below link and read through a biography of Pythagoras as a class. http://www.mathopenref.com/pythagoras.html

For homework students are to ask their parents the gold square question and then explain why their parents' choice didn't actually matter.

Archimedes:

Begin the class reading the following biography on Archimedes from PBS, <u>http://www.pbs.org/wgbh/nova/archimedes/lrk_biography.html</u> then conduct a class discussion. Where would we be today without the works of Archimedes?

Use Archimedes in teaching how the area of a circle was found. Use the following activity to help students explore how the formula to find the area of a triangle was developed. http://illuminations.nctm.org/LessonDetail.aspx?ID=L574

For homework students are to explain how the area or a triangle and trapezoid were formulated.

Isaac Newton:

Begin the period asking the class what they know about Isaac Newton. Who is he? Where is he from? What did he do? Where/when have you heard of him? Share the information as a class. Brainstorm with one another and come up with what you think you know about Newton and list it on the board.

The teacher can then show the following video and ask the students what was both good and bad, accurate and inaccurate about the video.

http://www.youtube.com/watch?v=NWE_aGqfUDs

Then have the students list out what they know now about Newton's three laws for homework.

Newton's 3 Laws

	Name:	
Newton's three laws are:		
1.)		
2.)		
3.)		