

Engaging Students in the Classroom Using YouTube®

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***Abstract.** Middle school students expressed their mathematical creativity and demonstrated their understanding of their math content by creating mathematical videos that they shared on the World Wide Web using the familiar site YouTube®. This activity helped to get students engaged with the mathematical content in a way that was appealing to their technologically savvy generation. This assignment helped the instructor by providing a performance-based assessment of student understanding that was unanticipated but highly welcomed!*

This classroom strategy falls under the category of “If you can’t beat ‘em, join ‘em”. We are all acutely aware of the technology savvy of our students. There is a generation that is truly plugged in and visually stimulated. Late in the school year, after my students had completed standardized testing, I was searching for a way to hold their interest and to stimulate learning for the remainder of the school year. This lesson took place in normal 8th grade classrooms at a high school close to a major metropolitan city. The three classes had a total of 54 students that contained 78 percent Caucasian, 18 percent African American, 2 percent Asian and 2 percent Middle Eastern students.

YouTube® (<http://www.youtube.com>) is a Google-owned, internet-based, video-sharing tool that is popular with many adolescent web users. There is a lot of math related information on this website (search: **math learning** and you will find about 1,000 videos related to math learning!) I had already utilized YouTube® in the classroom during the year, I found the website to be a valuable source of information that provided many video clips that either introduced or strengthen the topic of the day.

One excellent video for the introduction of the Pythagorean Theorem can be found at the URL: <http://www.youtube.com/watch?v=hO69k76DtK8> . This is an entertaining video that is cleverly edited to feature the popular culture icons Arnold

Schwarzenegger and Matt Damon. Showing this as an introduction helped me hook the student's attention. Another useful video that I used to summarize my classes work on the Pythagorean Theorem can be found at the URL:

<http://www.youtube.com/watch?v=0HYHG3fuzvk>.

Of course, not all videos available through YouTube® are of the same quality and some of the videos that I used with my students weren't as effective as I would have liked. When my students complained that the videos that I was using were boring I decided to use their complaints as a leverage point to encourage them to create their own videos. As they found the videos on a particular topic inadequate I challenged them to make their own video that would illustrate the mathematics, allow them to express their own creativity, and let them utilize technology in an educationally appropriate manner.

My first step was to devise a handout for the students. This handout included my expectations for the project; I wanted the project to be fun and educational. The handout included some basics for the project. Handout is included at the end of this paper. The students would be working in small groups of their choice, the video should be no more than four minutes in length and that they should keep in mind that they are representing their school. The students understood that I had the final approval before a video would be submitted to the YouTube® website.

To get the students started the students were provided with a list of suggested topics, however they were free to choose any topic that they had learned in the school year in mathematics. In addition, we established a weeklong timeline for the creation of the videos:

- Monday-chose a partner or small group to work with and begin researching your topic.
- Tuesday-Groups should discuss “how” they will present the topic and determine if they need props, charts, posters, etc.
- Wednesday-This is script writing day. Groups should finish their ideas of exactly how the video will go.
- Thursday-Students will do a practice run of their video.
- Friday-Taping day, students should be completely ready to make their video.

For students who may be a little camera shy, this project can easily be done without anyone having to be on camera, the students were told they could use puppets or just do a voiceover if they didn't want to be seen. My school district's policy also required that I also created a permission form that required parental consent for any students whose face was going to be seen on camera.

Many of the students chose to do their video on solving two-step algebra problems. I'm not sure that this was due to the fact that it was the last topic we discussed or the fact that they enjoyed the topic because they were surprised to find out how easy it was. Either way I was happy to see them so excited over this project. The students really loved doing their videos and I could see their pride in watching the videos after they were completed.

As this was a first time project for my students and myself I was thrilled with the overall resulting videos. In critiquing the videos based on the ability to grab the attention of the viewer and the mathematical accuracy I believe that the video titled Algebraic Fractions <http://www.youtube.com/watch?v=RyEkWBJNo1I> does the best overall job.

This video quickly adds entertainment in the form of paper wads being thrown at a student who states “he can’t do the problem”, the participants are laughing and I feel that the audience is engaged and anxious to see what is coming next. This video accomplishes what I believe to be the goal of incorporating YouTube® into my lesson, it is a “hook”, a way to get the students’ attention and to make them hungry for more.

In another clever video produced as part of this project about the Pythagorean Theorem <http://www.youtube.com/watch?v=-i4Sa-FAf5I> the girls here are school cheerleaders who added a cheer to the end of their video that included a rhyming story of a friend that is stuck in a tall tree. In this video the girls tried to incorporate a real life situation into their math problem. Again I believe that the ability to entertain is shown well in this video.

As a last example, the video Integer Rules was developed to help students understand rules for signed integers (<http://www.youtube.com/watch?v=SXqat84hVXM>).

Unfortunately for the future viewers, the video comes across as dull. While the information is correct and it showed me that the students themselves understood the rules, as a tool to help others it needs a little boost. Looking at the video now I realize that adding something as simple as a hand puppet or an action figure with a funny voice is all this video needs to be more classroom friendly.

The students really came up with some clever ideas. One group wrote a song to help them remember integer rules and sang it with the use of puppets. Another group demonstrated how various triangles are used in basketball strategies. A third group added a popular song that happened to be titled “Two Step” to the end of their video, this video

has already been viewed over a thousand times. One student's talent in art is demonstrated in his picture book story of the integer rules.

I learned some things from this project as well. I learned that my students were creative and talented. I was also able to assess their understanding of certain topics and in what areas they may have a weakness. My original time line was just a guess, since this project was new to me, however I think that the time allowed was adequate. Most groups were ready for the Friday videotaping, a few were not quite ready, but that worked out because they were not enough time to videotape everyone in one day anyway. The next time I do a YouTube project I will pay closer attention to their practice day and make sure that their video is mathematically correct. There ended up being a few boos in the final videos we posted, but overall I was very pleased with the outcomes.

For the next school year I am considering utilizing this video project more often. I believe that I could use the video productions at the end of each topic discussed. The students could do a one to two minute explanation of the topic. This would allow for an informal assessment and/or a mini-review before a formal assessment.

If you are considering this project for your classroom (and I think that you should) I would encourage you to first explore the YouTube website if you have not done so already. Simply type in your subject matter in the search box and you should find that they are many fine videos to use in the classroom. Just make sure that you view them ahead of time so that there are no surprises.

My students' videos can be found under *stbernardteacher* on the YouTube website. If you are looking for a way to engage your students in learning, then this project is sure to be a winner with you and with your students. I encourage you to give it a try.

Nancy Grunewald (Nancy.Grunewald@sbpsb.org) is a four year veteran of teaching junior high mathematics. She is currently teaching in Chalmette, Louisiana. It is Nancy's hope to continue to find and use diverse strategies in the classroom to keep her students engaged in learning.

You Tube Project

Handout to Students

This week you will be working by yourself, with a partner or in a small group with no more than 4 students. This project is to show your understanding of a certain aspect of 8th grade mathematics. Your final video should be no more than four minutes in length.

The following is a list of possible topics for your video. Mrs. Grunewald must approve any other topic:

- Integer rules
- Measures of Central Tendency
- Distributive Property
- Solving 2 step Algebra Problems
- Fractions to Decimals to Percentages
- Pythagorean Theorem
- Types of Triangles
- Area and Perimeter
- Volume and Surface Area

Keep in mind that this is a school project, that you are representing yourself and Chalmette High School. It is my hope and desire that the resulting videos will be entertaining and educational, something that we can all be proud of.

I have never undertaken this type of project before so some of this will be a learning experience for me. The following is our tentative schedule for the completion of this project.

Monday - Choose partner or group and topic. You will also begin research to make sure that you are comfortable in teaching your topic in the video.

Tuesday – Groups will discuss the “how” of your project, how you will present your topic. Do you need props, charts, posters??????

Wednesday – Script writing day. Groups will finish their general ideas of how exactly the video will go.

Thursday – Begin at least a dry run of the video. Each group will be presenting a full rehearsal.

Friday – Taping day. Live action.

All videos will be taped at the discretion of Mrs. Grunewald. Mrs. Grunewald has the final say on the completed videos. She will be responsible for uploading the videos on to the YouTube website.

This project will be graded as a test grade. All participants are required to share equally in this project. It is not necessary for everyone or any one to be on camera. If everyone in the group is camera shy, then the video can be done as a voiceover.

Every student that appears on camera must turn in a signed permission slip before the videoing can be done.

Let's get started and have a fun educational experience.

Letter to Parents

Dear Parents or Guardians,

During this school year I have found that there are many educational videos on the YouTube website which I have used in my classroom. The students have enjoyed being able to view this genre as part of their learning.

This week I will be allowing the students to work in small groups to write and produce a video that we hope to post to the YouTube website. I will have the final approval on what we post to this website.

By signing below you are giving permission for your child to possibly appear on the video. It is not a requirement for each student to appear in the video. Any group may decide to create their video as a voiceover. Each group will decide on an 8th grade math topic that they feel confident they can teach in a 3-4 minute production.

I give my permission for _____ to appear in a YouTube video that will be produced in Mrs. Grunewald's math class.

Parent/Guardian Signature

Date

Each student will be contributing in some way in this project that will count as a test grade.

Please call me at the school if you have any questions.

Sincerely,

Mrs. Grunewald

YouTube Project Worksheet

**Make decisions as a group, but every member needs to complete this worksheet.

Members of Group

Topic _____

How are you going to demonstrate your topic

Introduction (the hook)

Main Idea

Conclusion

Props Needed (and who is making/bringing them?)

Now ask yourselves these questions----

Is your video educational?

Are you demonstrating your knowledge of the subject?

Will the viewer understand what you are teaching?

Are you proud of your work?