MATH, SCIENCE, COMPUTER SCIENCE PROGRAM
UPCOUNTY CENTER PROGRAM

Roberto Clemente Middle School
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Dear Eighth Grade Student,

We are looking forward to this upcoming year of learning and challenges. Below are your eighth grade Center teachers and your summer assignments. We hope you enjoy your summer!

The Math, Science, and Computer Science Team

Center Computer Science

Ms. Lena Polishchuk - Lena_Polishchuk@mcpsmd.org

Ms. Polishchuk graduated from St. Petersburg University (at the time Leningrad University) with an equivalent to MS in Mathematics and Computer Science. She also graduated from Boston University with an MS in Business Management. Ms. Polishchuk has been teaching since 1981. She has been with MCPS since 1997 and with the Math/Science/Computer Science Center Program at RCMS since 2007. She previously taught Magnet Geometry in the program. Before coming to Clemente, Ms. Polishchuk taught Computer Science, including AP Computer Science, at Albert Einstein High School.

There is not a specific Computer Science 8 summer assignment. Over the summer students are encouraged to consider the use of information technology in their personal world and in the world of others. Topics to consider could include artificial intelligence and the economy, social network websites and safety issues, inter-relatedness of computer programs and daily life, the proliferation of web-based video to disperse opinions and thoughts, and the legal and ethical use of technology by individuals, groups, and government.

Computer Science 8 uses individual, partners, and team structures to complete class assessments. Since technology undertakings often involve working with others to achieve a goal, the partner and team arrangement provides the student with knowledge as to how teams successfully function and, at times, unsuccessfully function.

The following items are not required of the students. However, if the student has *access* to them it sometimes makes assignment completion easier:

- Flash Drive, 4 gigabyte minimum, plug-and-play
- Access to *Python* at home

Center Science

Ms. Roseann Brady Roseann_M_Brady@mcpsmd.org

Ms. Brady graduated from Loyola University of Chicago with a degree in biology and a minor in chemistry. She worked for many years doing basic research in neuroscience at several universities and in biotechnology companies across the country. Ms. Brady has been teaching at Roberto Clemente since 2006.

STEM, **s**cience, **t**echnology, **e**ngineering and **m**athematics shape our world. One of our focuses next year, both on our trip to Boston and in the classroom will be STEM. How has STEM changed over the years and what are some problems that we as a society now face which can be solved through advances in STEM?

Your summer homework will be to research engineering achievements that addressed specific needs, whether economical, medical, travel, etc. of society. Please use the following categories in completing your assignment:

- **Behavioral and Social Sciences**
  Human and animal behavior, social and community relationships—psychology, sociology, anthropology, archaeology, ethology, ethnology, linguistics, learning, perception, urban problems, reading problems, public opinion surveys, educational testing, etc.
- **Biochemistry**
  Chemistry of life processes—molecular biology, molecular genetics, enzymes, photosynthesis, blood chemistry, protein chemistry, food chemistry, hormones, etc.
- **Biology**
  Study of plant and animal life—agriculture, agronomy, horticulture, forestry, plant taxonomy, plant physiology, plant pathology, plant genetics, hydroponics, algae, etc. , and animal genetics, ornithology, ichthyology, herpetology, entomology, animal ecology, paleontology, cellular physiology, circadian rhythms, animal husbandry, cytology, histology, animal physiology, invertebrate neurophysiology, studies of invertebrates, etc.
- **Chemistry**
  Study of nature and composition of matter and laws governing it—physical chemistry, organic chemistry (other than biochemistry), inorganic chemistry, materials, plastics, fuels, pesticides, metallurgy, soil chemistry, etc.
- **Computer Science**
  Study and development of computer hardware, software engineering, internet networking and communications, graphics (including human interface), simulations / virtual reality or computational science (including data structures, encryption, coding and information theory).

- **Earth and Space Science**
  Geology, minerology, physiography, oceanography, meteorology, climatology, speleology, seismology, geography, astronomy, planetary science, etc.
- **Environmental Science**
  Study of pollution (air, water, and land) sources and their control; ecology.
- **Mathematics**
  Development of formal logical systems or various numerical and algebraic computations, and the application of these principles—calculus, geometry, abstract algebra, number theory, statistics, complex analysis, probability.
- **Medicine and Health**
  Study of diseases and health of humans and animals—dentistry, pharmacology, pathology, ophthalmology, nutrition, sanitation, dermatology, allergies, speech and hearing, etc.
- **Microbiology**
  Biology of microorganisms—bacteriology, virology, protozoology, fungi, bacterial genetics, yeast, etc.
- **Physics**
  Theories, principles, and laws governing energy and the effect of energy on matter—solid state, optics, acoustics, particle, nuclear, atomic, plasma, superconductivity, fluid and gas dynamics, thermodynamics, semiconductors, magnetism, quantum mechanics, biophysics, etc.

From these eleven possible categories, students are to choose **four** that interest them the most. Research a historically important engineering accomplishment from at least 50 years ago and within that same category, research a recent (past 5 years) engineering accomplishment and write a **minimum** of two paragraphs (at least 6 sentences each) comparing and contrasting the two. Do this for all four categories.

For example:
Category: Computer science
Historical Engineering accomplishment: Printing Press
Recent accomplishment: IPad

Students will be graded on ideas and content of their paragraphs.
This homework will be due August 30, 2013.

Please note: Unlike previously, this assignment is not necessarily connected with students' Science Fair Project. As last year, students will be required to participate in the Montgomery County Science Fair which will be in March.

If you would like to look ahead at the required Montgomery County Science Fair Rules and Regulations, please check out the following website:
http://www.sciencemontgomery.org.

Mathematics

Center Geometry – Mr. John Fleming – John_S_Fleming@mcpsmd.org

Mr. Fleming earned his Bachelor of Arts degree in Liberal Arts from St. John's College, Annapolis, MD. He worked in the commercial construction industry as an estimator, project manager and superintendent for 15 years before getting a master's degree in Education from the University of Maryland in 1994. He received his secondary math certification in 2008.

Mr. Fleming began teaching in Montgomery County in 1993 at Washington Grove Elementary School. He has been teaching in the Center Program since its inception in 2003.

Center Geometry is offered to students who have demonstrated mastery of enriched Algebra I concepts. The units of study include geometry, exploring geometric relations and properties, logic and geometric proofs, right triangle relationships and coordinate geometry, similarity and trigonometry, measurement, circles, and patterns in geometry and algebra. The concepts of Algebra I are integrated throughout the course, as their use is appropriate.

The first unit of the course is a review of Algebraic concepts. We will be reviewing Algebraic concepts as a tool for solving geometry problems.

Center Algebra II – Ms. Nancy Easley – Nancy_L_Easley@mcpsmd.org

Ms. Nancy Easley is the Math Content Specialist at RCMS and will also be teaching our Center Algebra II class. She has extensive background in mathematics instruction and has just completed her Master's degree in Educational School Leadership. Ms. Easley has been teaching mathematics since 1980 and has worked for Montgomery County Public Schools since 1999.

Algebra II with Analysis is an intensive, accelerated course intended to prepare students with the necessary motivation and ability for advanced mathematics courses. Algebra II with Analysis focuses on the use of technology and data analysis to develop students' thinking, problem-solving, and communication skills. The students will study the properties, applications, algebra, and parametric representation of functions including linear, quadratic, radical, exponential, logarithmic, polynomial, and rational functions. Data analysis techniques include the use of re-expression and residuals to find and verify best-fit rules will also be covered as well as applications and properties relevant to advanced mathematics. A big part of the Center's math programs is the interdisciplinary focus which enables the students to integrate topics from other disciplines for applications and investigations.

The majority of the first semester in Algebra II with analysis will concentrate on linear functions. Students will be reinforcing the topics they learned in Algebra I along with some extension of these topics. The second semester of the course focuses on functions that are not linear including quadratics, exponential, logarithmic, polynomial and rational functions.

A graphing calculator is recommended for Algebra II and Geometry courses. Our teachers use the TI-83+ calculator in the classroom, however, any graphing calculator which has a table of values function will be fine. Your teacher will be sending out forms at the beginning of the year if you need assistance with obtaining a graphing calculator.

Your **summer assignment** is to complete the appropriate math packet based on your placement for next year available on the Clemente web site. Our web site is www.robertoclementems.org The math packet is due on the first day of school.