Memorandum

To: Patty O'Neil

From: Larry Bidlack & Terry Bleau

Date: 4/4/2012

Re: Summer Academic Camps at the Middle Schools

This summer we plan to continue to offer the reading camp that we have done the last several years as well as adding a STEM (science, technology, engineering and mathematics) camp. Unlike the reading camp which is by invitation only to those students who have participated in our special education programs or reading support programs, the STEM camp will be an open invitation to the middle school students. Attached is a brief summary of the STEM camp, a copy of the parent letter for the STEM camp and the parent letter for the reading camp. It is our hope that these camps will be beneficial for all of the students involved as well as keep a connection between the students and the schools. The reading camp will be housed at North this year and the STEM camp will held at South, but current 6th and 7th grade students in both schools will be participating in these activities.

Proposed Summer STEM Camp – GMS 2012

The purpose of offering the STEM (Science, technology, engineering and mathematics) Camp is to offer the students at the middle school level an educational, fun and interactive camp experience in the summer. This proposal is intended to be a self funded science camp for one full week with the option of offering multiple sections of the same camp during the summer. Each camper would be charge $50 for the week which is intended to cover the costs of materials and staff. The minimum number of campers in a session will be 25 with a maximum number of 35. This camp will be open to students entering 7th and 8th grade in the fall. Three separate units would be completed each day for a total of three hours. The units are listed below.

- Sports Science (Biology and Physics)
- Local Ecology (Environmental Science and Earth Science)
- Solving Engineering Problems (Engineering, Physics and Math)

In addition, an "over-laying" technology use project will allow participants to document the camp with video cameras and edit a final compilation that they can take with them.

Sports Science:

Day 1 – Sports Anatomy & Physiology

- Muscles, tendons, joints and ligaments
    - Fast twitch and slow twitch muscles
        - Explanation
        - Fatigue and Temperature activity
    - Reaction Time
        - Explanation
        - "Fastball Reaction Time" (online)
        - Dollar Activity (Sporting Life pg. 22)
    - Mammalian Musculature (DEMO: Cat or Rabbit Muscle Dissection)
    - Physics of Your Feet Lab

Day 2 – Energy of the Projectile

- Explanation: Why A Ball Bounces
    - Deformation and Spring Back
    - Water Balloon Demo
- Baseball Specs and Testing (How It Works pg. 6)
    - Tech Ed Press Compression Measurement
    - Pressurized Tennis Balls, Over and Under Inflated Basketballs
- Energy of a Bouncing Ball Lab (Sporting Life pg. 93)

Day 3 – Aerodynamics of the Projectile

- Baseball Dissection (How It Works)
- Smooth vs. Stitched (Increasing and Decreasing Drag)
    - Leaf Blower and Whiffle Ball Demo
    - Golf Ball Dimples
    - Tennis Ball Fuzz

- Bernoulli's Principle
- Frisbee Physics

Day 4 – Throwing with "SPIN"
- Throwing Further: W = F x D ("Reach Back")
- Spin
    - Why does a spinning ball make it curve? (Sporting Life pg 84)
    - Putting spin on the ball (Sporting Life pg 91)
    - Football spirals
    - Baseball Pitches
- No Spin
    - Superball Table Bounce Trick (Sporting Life pg 97)
    - Knuckleballs

Day 5 – WHACK IT!
- The Sweet Spot (Sporting Life)
- Maximizing Rebound (Tennis Racket)
- Minimizing Vibration (Baseball Bat)
- Minimizing Handle Forces (Wood vs. Aluminum Bat)
- Swings, Slices & Hooks (Golf)

Geneva Environmental Science:

Day 1 – Greener Greenhouse
- What is the Greenhouse Effect?
- Why do we care about the Greenhouse Effect?
- Construct Greenhouse Effect Jars, find a place for them (EcoLabs pg. 56)
- "Greener Cleaners" Lab Stations (EcoLabs pg. 83)

Day 2 – Ecology Field Methods
- What is ecology? What does an ecologist do?
- 2 or 3 ecology field methods described, emphasize water ecology
- Use methods to collect water samples (pond, swamp, etc) for tomorrow
    - bring in collected water from golf course pond

Day 3 – Water
- Organisms in water samples (microscopes) – "Water Wigglers" (EcoLabs pg. 1)
- Water Testing
    - "How Clean Is The Water" Test Kits
    - Homemade Turbidity Meter

Day 4 – Water Part 2
- Acid Rain and Plants (Plant Biology pg. 62)
    - What is acid rain? How/why does it occur?
- The Frogs are Off Course (EcoLabs pg. 48)
- If time, A Filter with Culture (EcoLabs pg. 31)

Day 5 – Oil Spills
- Oil Spill Pictures
- Gulf Oil Spill Discussion, Clean-Up?
- Oil Spill Creation and Clean-Up (EnvSci created lab)

Solving Engineering Problems:

Day 1 – What do engineers do?
- What is engineering? How do engineers solve problems?
- Spaghetti and Marshmallows Tower – Height using available materials designed in different ways

Day 2 – A Specific Problem: Parachutes Part 1
- What Goes Up, Must Come Down: IMSA 2012 Parachute Lab
- Design and testing

Day 3 – A Specific Problem: Parachutes Part 2
- What Goes Up, Must Come Down: IMSA 2012 Parachute Lab
- Rooftop Parachute Drop

Day 4 – A Specific Problem: Projectiles Part 1
- Don't forget projectiles from Sports Science – Tennis Balls
- Projectile Bowling: IMSA 2011 Projectile Bowling Lab
- Design and testing

Day 5 – A Specific Problem: Projectiles Part 2
- Projectile Bowling: IMSA 2011 Projectile Bowling Lab
- Projectile Bowling Competition

April 23, 2012

Dear Parent or Guardian,

This summer we are offering a unique summer camp opportunity at the middle school level. Our STEM (Science, Technology, Engineering and Math) camp is an opportunity for students to have some fun with science and math over the summer vacation. Students will participate in a variety of activities centered on three main themes.

- Sports Science (Biology and Physics)
- Local Ecology (Environmental Science and Earth Science)
- Solving Engineering Problems (Engineering, Physics and Math)

Each day the students will have a different activity for each theme. For example one day may include a study of the aerodynamics of the projectile, then students would move on to a study of oil spills and finally wrap up with designing a parachute.

The camp will be three hours each day from 9:00-12:00 for five consecutive days Monday-Friday. Depending on student interest we may run multiple weeks of the same camp. Please return the attached form with your preferences for the week your child would prefer to attend. The cost of the camp is $50 per camper. The camp is open to all current 6th and 7th grade students at GMS North and South. The camp will be held at GMS South.

If you are interested in having your child participate in our STEM camp, please complete the attached form and return it with your payment to your school's main office by **Friday, May 11th**.

We are excited to offer this opportunity for your child and hope they will be able to join us! If you have any questions, please do not hesitate to contact me at 463-3600.

Sincerely,

Larry Bidlack & Terry Bleau
Principals GMS North and South

STEM CAMP ENROLLMENT FORM

Student Name_____ Grade completed this year_____

Parent Name _____

Contact Numbers _____ _____

Summer Session Selection: Please rank your choices from first to last. If your student is unable to attend a specific week please mark an "X" to denote the conflict. The camp will only run if there are enough students for the sections selected.

June 18-22 _____

June 25-29 _____

July 9-13 _____

I understand that I will need to provide transportation to and from the STEM camp each day.

Parent Signature_____