


***Mobile Science Lab***  
**2010 National Health Science  
Curriculum Conference**  
**October 22, 2010**

# Today's Journey

- 
- Mayo Clinic Career Awareness/Education Programs
    - Programs & the “Flying Wedge”
    - Health Science Careers Center
  - Mobile Science Lab
  - Questions

# Mayo Clinic Career Awareness Program

- Current Program Tools:
  - ✓ E-Mentoring
  - ✓ Advanced E-Mentoring
  - ✓ Career Speaker Program
  - ✓ Career Awareness Website/Brochure
  - ✓ High School Student Visits
  - ✓ Mayo Clinic Career Observation Program
  - ✓ Mayo Clinic High School Mentorships
  - ✓ Mayo Clinic Work-Study Program
  - ✓ Youth Apprenticeship Program
  - ✓ HOSA (Health Occupation Students of America)
  - ✓ Health Care Career Festival
  - ✓ Teacher Externships

# Mayo Clinic Career Awareness Program *Program Structure*

## 6th Grade:

- **E-Mentoring**

## 7th - 10th Grade:

- **Career Speaker Program**
- **Career Awareness Website**
- **High School Visits**

## 11th - 12th Grade:

- **Career Speaker Program**
- **Career Awareness Website**
- **Health Care Career Festival**
- **Careers Observation (MC-COP)**
- **HOSA programming**
- **Advanced E-mentoring**
- **Work-Study Program**
- **High School Visits**
- **Youth Apprenticeships**
- **HS Mentorship**

## College:

- **Healthcare Career Festival**
- **Career Awareness Website**
- **Summer Employee Brown Bag Seminars**
- **Career Services Relationships**
- **On-Campus Activity**
- **Membership in College Associations**
- **Students on Mayo's Campus**

**Awareness**

**Confirmation**

6th grade

7th - 10th grade

11th-12th grade

College

E-mentoring

Career Speakers  
Career Awareness Website

High School Tours

Career Speakers Website

H.C. Career Festival  
MC-COP

HOSA

Adv. E-mentoring

Work-Study

High School Tours

Apprenticeships

HS Mentorships

H.C. Career Festival

Career Awareness Website

Summer Employee Brown Bag Seminars

Career Services Relationships

On-Campus Activity

Membership in College Associations

Students on Mayo's Campus

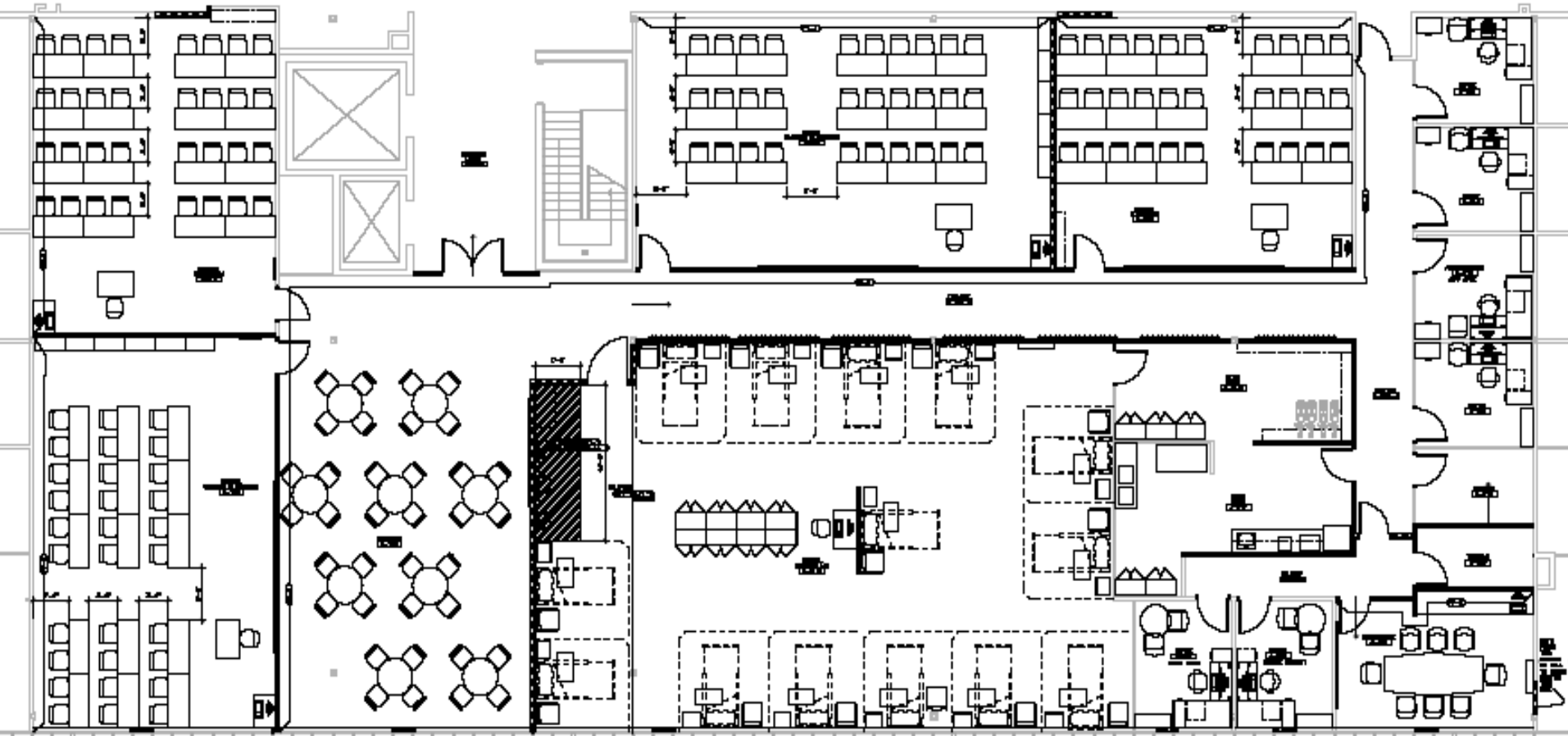
## Other Tools:

Exploring Program, Teacher Externship, Special Department Programs, Mobile Science Lab

# “Health Science Careers Center”

- **What is it?**
  - **Partnership: Rochester Public Schools, RCTC & Mayo Clinic**
  - **Offered to Century, JM, & Mayo as well as Lourdes & Home School students**
  - **Curriculum: Career Exploration, Anatomy, Physiology, Terminology, First Responder...and more**
  - **Nursing Assist. State Approved Program and Pharm. Tech. Cert.**
- **Current Facts about the Health Science Careers Center:**
  - **New Number on students: '04: 60, '05: 90, '06: 128, '07: 158, '08: 216, '09: 147, '10: 222**
  - **Students registered now: ~185 1<sup>st</sup> Semester (expect to be at ~220 again by 2<sup>nd</sup> Semester; Space can hold 230-240)**
  - **Class typically is 30% - 40% diverse (Entire School: ~28%)**
  - **Continues to provide students with HOSA (Health Occupation Students of America) activity:**
    - **Daily class work**
    - **State Level Conferences**

# Facility Layout

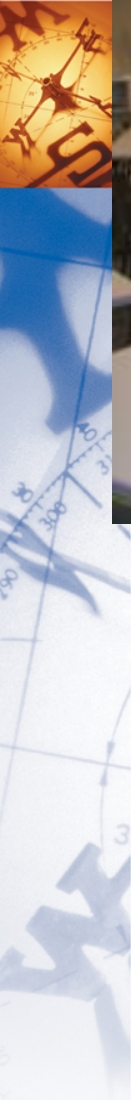


**Approximately 11,000 square feet...total commitment is around 1.3 million including construction, classroom furniture, leasing the space, medical equipment and technology equipment**



MAYO CLINIC

# Medical Careers Classrooms



# Conference Rm, Storage & Teachers Office



# What is the HSCC doing today?

- Created curriculum for Introduction to Health Science Careers, Therapeutic Medicine, Pharmacy Tech., and Biomedical Science
- Students enroll in one semester of the Intro. to Health Science Careers and the second semester they choose a pathway

## **Pathways available:**

- Biomedical Science\*\*\*
- Therapeutic Medicine
- Nursing Assistant
- Pharmacy Technician



# Mobile Science Lab...

# History Behind the Mobile Science Lab

- Conversation started in August 2006; Mayo's involvement started in December 2006
- SMIF pulled a team together to discuss a BioBus/Mobile Science Laboratory
- Stakeholders: **Minnesota State Mankato, Winona State, Office of the Chancellor-MnSCU, RCTC, MN DEED, Workforce Development, Inc., Greater Mankato Economic Development, HealthForce MN (formerly CIHSEP), Rochester Area Math Science Partnership, Mayo Clinic, Mankato Public Schools, Byron Schools, SE Minnesota Development Corporation, SW Minnesota Development Corporation, South Central Service Cooperative, Southeast Service Cooperative, Southern MN Initiative Foundation**

# History Continued...

- Wonderful conversations from late 2006 thru the summer of 2007; at that point, it was decided to move away from the BioBus to a Mobile Science Lab (**based on the Teacher Academies already in place at Mayo Clinic thru RAMSP**)
- Duplicate the effort to other parts of Southern MN
- In October 2007, RAMSP, Southeast Service Cooperative and Mayo Clinic began to develop the Mobile Science Lab in connection with the Academies
- From November 2007 thru January 2008, the business plan, budget and proposal was developed
- In February 2008; proposal submitted to HealthForce MN
- April 2008; funding approved by HealthForce MN...after a “sad” period...



# Why the Mobile Science Lab versus the BioBus?

- Integrated curriculum versus a “WOW” impact:
  - Make available for a week at a school versus a couple of days
  - Multiple curriculum options
  - Connected to educator training
- Costs:
  - Start-up costs: \$600,000+ versus \$75,000
  - BioBus brings maintenance, transportation and employee costs along with the costs of consumables, equipment and logistics
  - Once purchased and supplied, a Mobile Science Lab is very affordable to operate
- There was a need and opportunity to support and improve an established program
- Hope that it can be reasonably duplicated

# Mobile Science Lab

- Partnership between Southeast Service Cooperative, Mayo Clinic and RAMSP
- Funded by HealthForce Minnesota and Mayo Clinic
- \$75,000 (\$50,000 in science equipment)



# Mobile Science Lab

- **Teacher Academies (Ross Aleff)**
- **Week long academies (9 teachers each week) focused on molecular genetics**
- **3 Academies per summer**
- **Not just for science teachers...agriculture teachers have participated**
- **The Mobile Science Lab provides the exact equipment to a school for one week so that educators can duplicate their Mayo educational experience with their students in their classroom**
- **School must have a “trained teacher” to reserve the lab**




# Mobile Science Lab

- It is not a Bus 😊
- Science Equipment is in “portable cabinetry” that can be wheeled from the trailer right into the classroom
- The portable cabinetry keeps the equipment safe during transport as well as provides a space to keep it in the classroom



# Curriculum Options

- 
1. **pGLO teaches cell transcription and translation of DNA to RNA to Protein**
  2. **Basic PCR teaches exponential amplification of DNA using heat resistant enzymes**
  3. **GMO teaches how crop DNA is modified to make them resistant to pests and chemicals (Ag)**
  4. **Milk/Cheese testing to make sure goat cheese actually is goat and not cow. (Ag)**
  5. **mtDNA uses their DNA to prove that we are more alike than different (RACE)**
  6. **Gel electrophoresis demonstrates movement of DNA using electrical current**
  7. **Soil testing shows that there are hundreds of fungi and bacteria in soil, many that are useful (Ag)**
  8. **CSI shows how DNA is used to track down crime scene suspects**
  9. **DNA mapping/restriction shows how we can cut DNA to create a map of the DNA**
  10. **DNA sequencing shows how we can read DNA base by base ( New clinical treatments will be based on your DNA sequence ) (Individualized medicine )**
  11. **DNA necklace shows that your cells contain DNA that you can see**

# Mobile Science Lab

- **First made available in December 2008**
- **Tremendous Response:**
  - '08/'09: 8 schools rented the Mobile Science Lab
  - '09/'10: Mobile Science Lab has been in schools during every rental period except for 3 (Thanksgiving, December break & late May).
  - Total use: 15 rentals (13 schools), estimated 820 students (max. yearly rentals is 18 with the possibility of impacting 1,200+)
  - Educator Quotes:
    - “Instead of taking notes on DNA; we are physically working on it!” K-M
    - “The entire experience was the highlight of my year, I greatly enjoyed sharing these techniques and technologies with my students.”  
Wabasha-Kellogg
    - “The best part of the experience...availability of resources we could never afford.” Z-M
    - “A parent contacted me and told me how excited his student was about doing molecular labs and using the cool equipment.” Fillmore Central

# Measuring the Impact


- We conduct usage surveys with all educators & students
- Educator Survey:
  - gathers student info (grade, class, # of students, etc.)
  - experiments conducted, what worked, what did not work...why?
  - problems with equipment?
  - what did the students like best?
  - what did you as an educator like best?
- Student survey; this is a pre-/post-survey effort to measure impact of the Mobile Science Lab:
  - questions to measure science interest before the Mobile Science Lab and after the Mobile Science Lab...used to measure the immediate impact
  - questions about book/lecture science versus hands-on/lab science
  - career interests
  - questions to measure student learning based on the actual experiments
  - how the Mobile Science Lab has personally impacted you?

# Parent Email sent to Ross

- “My 15 year old son is taking sophomore biology at Byron H.S. They have apparently been working with some supplies and curriculum you’ve carted out there for the science classes. Lucas has really been fairly interested in the biology class all year, but now with genetics module and lab equipment you’ve taken out there, he is pretty fired up. They’ve done PCR and gel electrophoresis and some e. coli work with a fluorescent module. When he gets home from school, he can’t stop talking about what he’s learned. He told me a few weeks ago he wants to pursue a biology-related degree in college, and now with the genetics module they’ve been going through he has narrowed his interest down to genetics. Thanks!” Chris (Mayo employee)



# Future of the Mobile Science Lab

- 
- **Lab # 2 has just been made available for the 2010-2011 school year...will provide 36 school visits**
  - **Funding from HealthForce MN (\$50,000), MnSCU/Winona State (\$10,000) and Workforce Development (\$10,000)**
  - **More Funding...consumable supplies, equipment replacement, logistics**
  - **Continue to dialogue w/ Hormel Institute regarding the Mobile Science Lab Program**
  - **Looking at Conferences to attend and share the Program Story...**
  - **Hope to see the program duplicated in other areas**

Questions???

Discussion??

Email: [finne.guy@mayo.edu](mailto:finne.guy@mayo.edu)

[www.mayoclinic.org/careerawareness](http://www.mayoclinic.org/careerawareness)