



*Detroit **A**rea **P**re-**C**ollege **E**ngineering **P**rogram (DAPCEP), founded in 1976 to provide STEM classes for Pre College students in Southeast Michigan.*

DAPCEP offers high quality education in classes in Detroit Public Schools, on Saturdays at participating universities and industries sites and residential programs at universities.

DAPCEP received its first NSF grant in the 1980's.

DAPCEP was awarded its first ITEST grant in 2002, awarded a renewal grant in 2005 which concluded in 2009.





Both ITEST Grants

120 students, 60 seventh grade students and 60 ninth grade students.

The evaluation criteria for both grants included:

- Focus groups for parents and students
- Pre/post surveys for parents and students
- Pre/post class assessments for students
- Parental workshops
- Mailed and online surveys
- Teachers interviews



The students in the ninth grade in 2003, graduated from HS in 2007 and the students in seventh grade in 2003, graduated from HS in 2009.

The students in the ninth grade students in 2006 are currently in the 11th grade and the seventh grade students in 2006 are currently in the 9th grade.



Strategies to Stay In Touch

- Pizza Parties
- Seminars
- Website/ UTube Posting
- Mailed and emailed surveys



Longitudinal Needs

Another strategy of acquiring data could include utilizing one or more of the social networking applications currently used by students. We could possibly find out what our students are doing, where our students are; get current their contact information and birthday data; etc.

We should stay in touch with student and their parents. Examples would be to send a birthday card or a holiday greeting. If the family moves, a forwarding address might be provided.



Parental Involvement



Innovative Technology in Science Inquiry Scale Up (ITSI-SU)



For sample activities visit:

<http://itsi.portal.concord.org>

Principal Investigator:

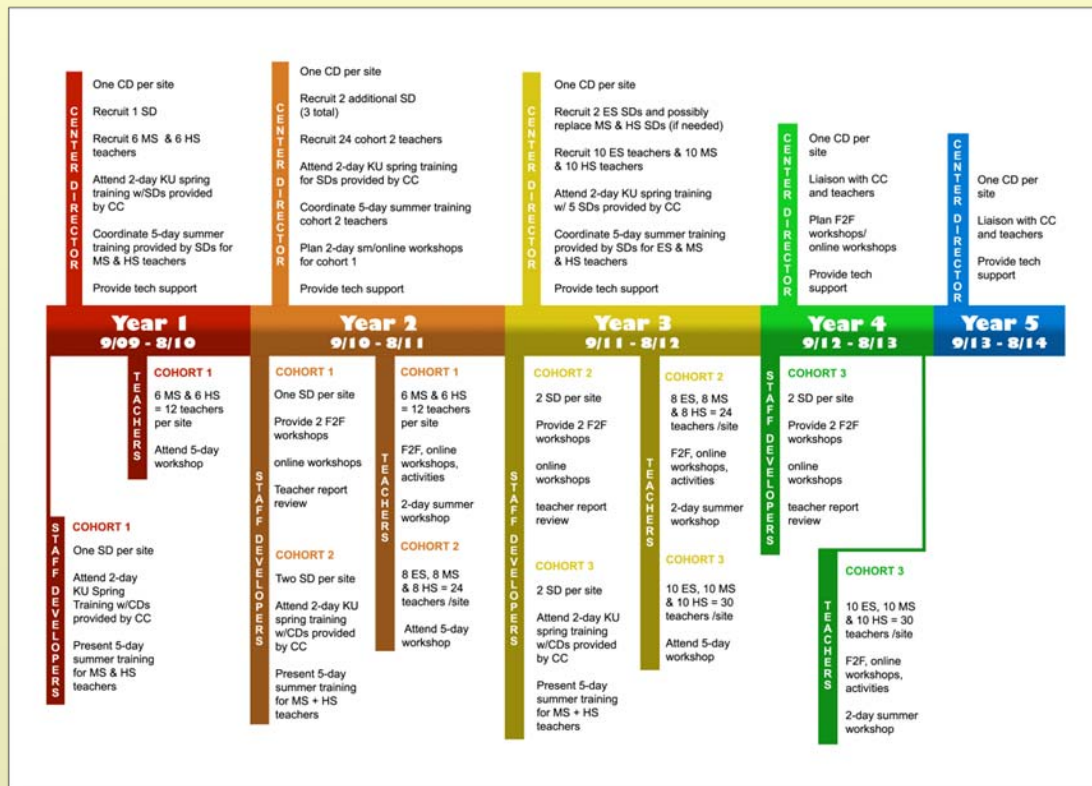
Carolyn Staudt - carolyn@concord.org



ITSI-SU Sustainability



Innovative Technology in Science Inquiry Scale Up (ITSI-SU) is a five-year project which will reach three times as many teachers as its predecessor ITSI in three years.




- ITSI-SU will reach 264 teachers over 3 years.
- Experienced teachers are selected and trained to be master teachers for the final 2 years.
- Certified trainers will continue to recruit teachers with a fee-based model after the project ends.
- Exemplars will be freely available from the ITSI-SU website.

Teacher Comprehensive Project



Collect Data



male
dragon
Male
Color: Yellow

☒ Male
 ☐ Female

male

Chromosome: 1

H

s

Horns

Scales

Chromosome: 2

W

I

T

Wings

Legs

Tails

Chromosome: X

P

f

a

B

Plates

Fire

Color1

Color2

Chromosome: 1

H

S

Horns

Scales

Chromosome: 2

W

I

T

Wings

Legs

Tails

Chromosome: Y

- **Teacher training** is extensive with workshops over the summer, face-to-face meeting and online courses.
- Teachers are also part of an **enriching online educational community** where they share their work which is peer reviewed by project staff, site directors and other teachers.
- The project website provides **templates** with rubrics for creating and **customizing** activities.

ITSI-SU Robust Design

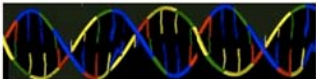


ITSI-SU provides activities in
earth, life, and physical sciences
for grades 3-12.

Protein structure – From DNA to proteins

Introduction/Discovery Question

This activity will focus on how information stored in DNA is read by the cell and used to build proteins that the cell needs.



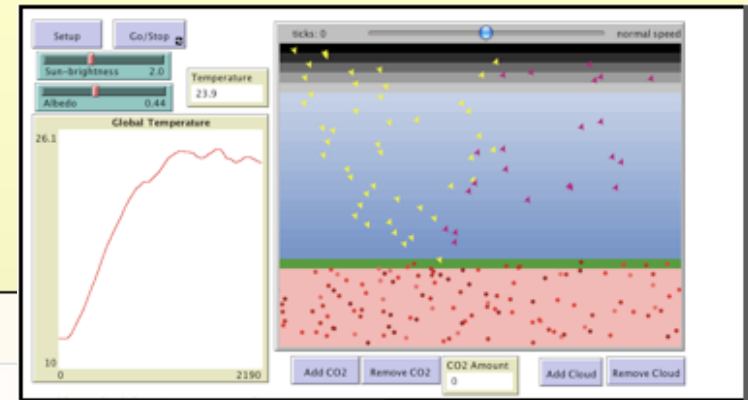
What is so important about DNA?

DNA is a long molecule found in the nucleus of every cell of all living organisms. DNA has several functions: storing and copying genetic information, passing it to the next generation and supporting genetic variability. Every living cell can translate information stored in the DNA into sequences of amino acids in the proteins made by the cell.

Collect Data

Explore DNA by highlighting different sections of the DNA fragment.

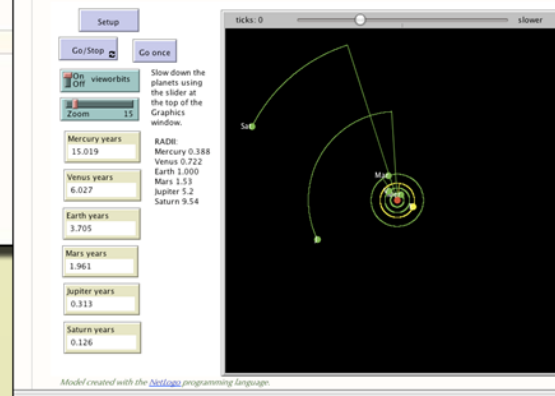
1. Examine the 3D model of DNA. Use the buttons below the model to highlight different features of the DNA.
2. In addition, you can rotate the model by placing the cursor on the DNA and holding down the left mouse button and dragging it.
3. Find a view that shows a view allowing you to see how the nucleotides from one DNA strand pair up with the nucleotides from the other strand. Describe the nucleotide pairings that you see.



Planet	Average orbit radius (AU)	Actual orbit time (Earth years)	Your measured orbit time (Earth years)
(AU)			
Mercury	.38	.24 (88 days)	
Venus	.72	.61 (224 days)	
Earth	1	1	
Mars	1.5	1.9	
Jupiter	5.2	11.9	
Saturn	9.5	29.5	

3. Compare your measurements to the actual orbit times. How good were your measurements?

Note: An **Astronomical Unit (AU)** is defined as the distance from the Earth to the Sun. It's a convenient unit for measuring planetary distances in the Solar System.



Meeting Special Needs



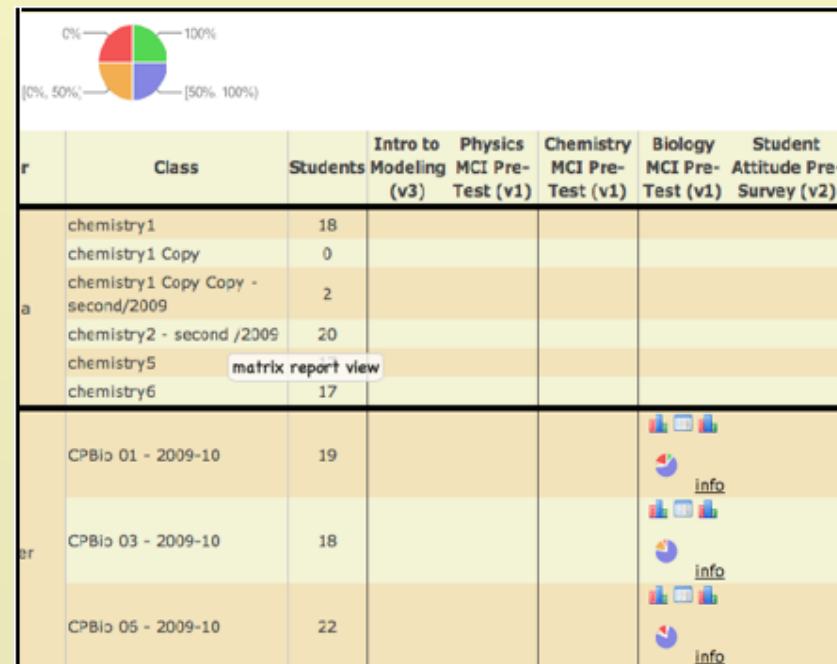
States offer a **diverse range of students** including urban and rural districts with an emphasis on low-income, minority populations. Each state has unique and different needs and will be able to create and modify activities so that they can meet their own **objectives and standards**.



Data Collection



- All students and teachers enroll as members.
- Teachers and students can view reports of student work.
- Student data persists after logging out. Teachers and students can view all work at a later date.
- Teacher customizations of exemplar activities are peer reviewed by fellow teachers.
- We monitor:
 - ~ Student and teacher use of activities
 - ~ All changes from original exemplars by teachers
 - ~ Responses by students




	Class	Students	Intro to Modeling (v3)	Physics MCI Pre-Test (v1)	Chemistry MCI Pre-Test (v1)	Biology MCI Pre-Test (v1)	Student Attitude Pre-Survey (v2)
a	chemistry1	18					
	chemistry1 Copy	0					
	chemistry1 Copy Copy - second/2009	2					
	chemistry2 - second /2009	20					
	chemistry5	matrix report view					
	chemistry6	17					
er	CPBio 01 - 2009-10	19					info
	CPBio 03 - 2009-10	18					info
	CPBio 05 - 2009-10	22					info

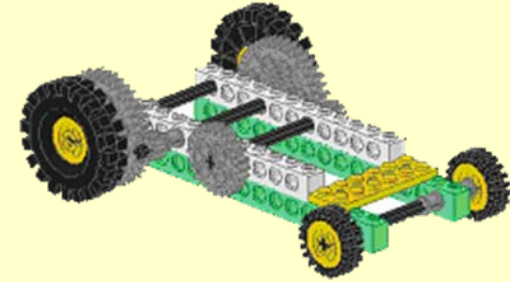
Longitudinal Data Collection



- If a 10% increase for students entering the work force was reported, what threats to validity should be addressed?
- What would be persuasive results from a 10 year study?
- How do you design the study?
 - ~ size and length
 - ~ random tracking
 - ~ sampling rate
 - ~ stratified study



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	CPBio 03 - 2009-10	18					
	CPBio 05 - 2009-10	22					

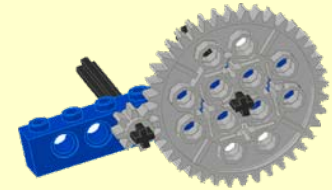


Robotics: Fundamentals of Information Technology and Engineering

Randal August
Academic Director, Lowell Institute School,
Northeastern University Boston, Massachusetts



The Project – Cohort 3

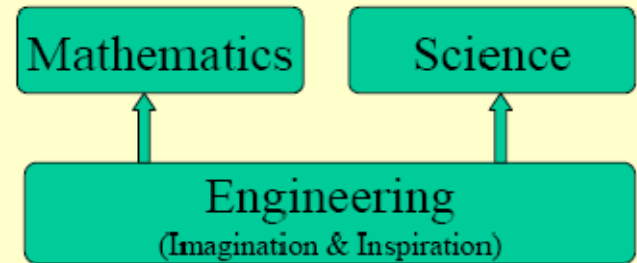


- Comprehensive Project
 - Teacher Professional Development
 - Student Outreach
 - Four years (including 1 year no cost extension)
- Successes
 - Trained 65 teachers in 7 school districts
 - Outreach to 220 inner city students (practicum)
 - After school programs involving over 1900 students



Program Breakdown

- Summer Outreach
 - One during first year
 - Two per year starting year 2
 - Five days long, 5 hours per day
- After School
 - Average 20 per year
 - Typically 12 weeks long, 1 day per week
 - Two hours long





Data Collection

- Basic Demographic Questionnaire
- Content Knowledge Survey
 - Based on MA State testing requirements
 - Augmented with Engineering Design questions
- Satisfaction / Attitude pre and post Surveys
- Observational Protocol (RTOP)

