CIBT Round Table Discussion with NYS Master Teachers

January 16\textsuperscript{th}, 2016

Information from Teachers who Have Done It And Still Love It
What does that mean?? Do you feel like you are being deluged with new acronyms? There are so many old and new ones out there that we thought we’d prepare a little primer on ones that you may know already, may have heard of but aren’t sure what they stand for, or you may not have heard of at all yet.

ACE – Accelerated College Education (Courses offered in high school through an agreement with Corning Community College which allows students to earn both high school and college credit simultaneously.)

AFL-CIO - American Federation of Labor and Congress of Industrial Organizations (A national trade union center that is the largest federation of unions in the United States, made up of fifty-six national and international unions,[3] together representing more than 11 million workers.)

AFT - American Federation of Teachers (An affiliate of the AFL-CIO, it was founded in 1916 and represents 1.5 million members in more than 3,000 local affiliates nationwide.)

AMAO - Annual Measurable Achievement Objectives (Under Title III of NCLB, districts (and county offices of education) must establish benchmarks and annually measure the progress of students trying to attain English proficiency.)

ACT - American College Test (Originally an abbreviation of American College Testing, the ACT is a standardized test for high school achievement and college admissions.)

AP – Advanced Placement (College-level courses that follow a nationally-standardized curriculum developed by the College Board. Students who enroll in AP courses earn extra ranking weight and may qualify for college credit.)

APPR - Annual Professional Performance Review (Section 100.2 of the Commissioner’s Regulations requires school districts and BOCES to annually evaluate the performance of probationary and tenured teachers providing instructional and pupil personnel services.)

AYP - Adequate Yearly Progress (A measurement defined by the United States federal No Child Left Behind Act that allows the U.S. Department of Education to determine how every public school and school district in the country is performing academically according to results on standardized tests.)

BEDS - Basic Educational Data System (BEDS day is the first Wednesday each October at which time school districts in New York collect information about student enrollment and staff.)

BIP - Behavior Intervention Plan (A plan that contains a definition or description of the behavior being targeted, a description of the interventions that will be used including who will be involved, specific procedures that will be followed and an explanation of how data will be collected, a measurable description of the behavior changes expected and a description of how the success of the interventions will be measured.)

BOCES/GST BOCES - Boards of Cooperative Educational Services/Greater Southern Tier Board of Cooperative Educational Services (The full legal name is Schuyler-Steuben-Chemung-Tioga-
Allegheny BOCES. BOCES provides educational leadership, services and support to meet the needs of our students and school districts and is designed to better serve the students in its school districts through collaboration and cost containment.)

BPT – Building Planning Team

BTALC/TALC - [Building] Teacher Administrator Liaison Committee

C4E – Contracts for Excellence (Program established in 2007 to provide additional accountability for increased State Aid for low performing school districts.)

CBO – Central Business Office (Allows school districts to share the cost of a variety of business services.)

CCR - Center for Curriculum Renewal (Established in February 1990 with the primary goal of providing program evaluation, technical support and professional development to schools implementing standards-based curriculum and to governmental and private organizations supporting schools.)

CCSS/CCLS – Common Core State Standards/Common Core Learning Standards (The New York State P-12 Common Core Learning Standards for English Language Arts & Literacy and the New York State Common Core Learning Standards for Mathematics include all of the national Common Core State Standards.)

CDEP – Comprehensive District Educational Plan (A collaborative tool that SED has made available to districts to comply with state and federal statutes for improvement of student achievement by guiding school districts to focus their available resources in an efficient and effective manner to help all students achieve the new, high learning standards.)

CDOS – Career Development and Occupational Studies (There are twenty-eight learning standards that the New York State Education Department has established for all students to achieve. The CDOS learning standards represent three of those learning standards that cut across all disciplines and should be integrated in all instructional areas. The CDOS learning standards address the areas of career development, applied learning and foundations skills necessary for success in the workplace.)

CIPA – Children’s Internet Protection Act (Enacted by Congress in 2000 to address concerns about children’s access to obscene or harmful content over the Internet.)

CIS – Children’s Integrated Services (A program of Chemung County that serves youth and their families with the goal of diverting troubled youth from higher levels of care within the child serving systems and is the entry point for children with significant behavior difficulties and/or a serious emotional disturbance.)

CMCW – Custodial, Maintenance, and Cafeteria Workers (The Elmira City School District recognizes as the sole and exclusive negotiating representative for a unit of employees consisting of all Custodial, Maintenance, and Cafeteria employees.)
CRO/SRO – Community Resource Officer/School Resource Officer (Commissioned law enforcement officers assigned to schools)

CTE – Career and Technical Education (BOCES program that offers high school students and adults the opportunity to learn job skills through instruction and hands-on experience.)

CWA - Communication Workers of America (The Elmira City School District recognizes the CWA as the exclusive representative of Monitor Dispatcher, School Bus Drivers, and Mechanics.)

DASA – Dignity for All Students Act (Signed into law on September 13, 2010, this law took effect on July 1, 2012, and seeks to provide the State’s public elementary and secondary school students with a safe and supportive environment free from discrimination, intimidation, taunting, harassment, and bullying on school property, a school bus and/or at a school function.)

DCIP - District Comprehensive Improvement Plan (All Focus Districts are required to develop a DCIP that details how the district plans to improve instruction and address the identified needs of Focus and Priority Schools.)

DDDM – Data-Driven Decision Making (A process that uses student assessment data and relevant background information to inform decisions related to planning and implementing instructional strategies at the district, school, classroom, and individual student levels.)

DPT - District Planning Team

DSS - Department of Social Services (Chemung County agency)

DTALC - District Teacher Administrator Liaison Committee

ELA – English Language Arts

ELL – English Language Learners

ESEA - The Elementary and Secondary Education Act (Passed in 1965 as a part of the "War on Poverty," it emphasizes equal access to education and establishes high standards and accountability. The law authorizes federally funded education programs that are administered by the states. In 2002, Congress amended ESEA and reauthorized it as the No Child Left Behind Act (NCLB).

ESCA - External School Curriculum Audit (A school-based improvement intervention that is used in the Corrective Action phase for those schools in both the Focused and Comprehensive categories. The Audit identifies how schools, designated as failing AYP for more than four years, have delineated, interpreted, aligned, articulated, and implemented the New York State Learning Standards for one or more accountability measures and student groups.)

ESSAC - Elmira Schools Supervisory and Administrative Council (The Elmira City School District recognizes as the bargaining unit of all certified administrators exclusive of the Superintendent of Schools and Deputy Superintendents/Directors.)
**ETA – Elmira Teachers’ Association** (The Elmira City School District recognizes the ETA pursuant to the Public Employees Fair Employment Act as the exclusive representative of all State Education Department certified personnel other than administrators, substitute teachers, and other casual employees who are employed by the Board of Education with respect to hours, wages and other terms. This includes deans, guidance counselors, social workers and school psychologists.

**FBA - Functional Behavioral Assessment** (A set of procedures originally developed to ascertain the purpose or reason for behaviors displayed by individuals with severe cognitive or communication disabilities. Because these individuals were unable to fully explain why they were displaying certain inappropriate behaviors, methods were developed to determine why they demonstrated such actions. By gathering data and conducting experiments that evaluated the effects of environmental variables on the behavior, staff members could usually decipher the meaning of the behaviors, determine why they were occurring, and develop behavior change programs [usually Behavior Intervention Plans] to help the disabled individual display more appropriate behavior in meeting his or her needs.)

**FERPA – Family and Education Rights and Privacy Act** (Legislation designed to protect the rights of parents and students regarding education records.)

**GED - General Educational Development** (The initials GED have also been used on diplomas to mean General Education Diploma, General Equivalency Diploma or Graduate Equivalency Degree.)

**HEDI - Highly Effective, Effective, Developing, and Ineffective** (Under the new law, New York State will differentiate teacher and principal effectiveness using these four rating categories.)

**HLS - Home Language Survey** (A district-developed tool required by Title I and the Office for Civil Rights that should identify students that may not be proficient in English.)

**IDEA - Individuals with Disabilities Education Act** (Originally enacted by Congress in 1975 to ensure that children with disabilities have the opportunity to receive a free appropriate public education.)

**IEP - Individualized Education Program** (Designed to meet the special educational needs of students who may have a disability, as defined by federal regulations. The IEP must be tailored to the individual student's needs as identified by the IEP evaluation process.)

**ISEA - Instructional Support Employees Association** (The Elmira City School District recognizes the ISEA as the exclusive negotiating agent for a unit composed of all employees in job titles in the classified civil service.)

**ISLLCS - Interstate School Leaders Licensure Consortium Standards for School Leaders** (The latest set of high-level policy standards for education leadership.)

**IST – Instructional Support Teacher**

**JIT - Joint Intervention Team** (A school identified for Restructuring in the Focused and Comprehensive categories is assigned a JIT by the Commissioner to assist in the planning and restructuring requirement. The JIT is composed of an Outside Educational Expert (OEE) with proven
experience in school turnaround, a State Education Department (SED) representative, and a district representative.)

**LEA – Local Education Agencies** (Refers to a public school district, or in rural areas a body that oversees multiple schools. The responsibilities of a LEA may include operating the public school system, distributing grant money to school projects, and contracting for educational services.)

**LGBT** (an initialism that collectively refers to the lesbian, gay, bisexual, and transgender community.)

**MGP – Mean Growth Percentile** (A measure of teacher performance based on the average of SGP’s in a teacher’s classroom.)

**NCLB - The No Child Left Behind Act** (Authorizes several federal education programs that are administered by the states. The law is a reauthorization of the Elementary and Secondary Education Act.)

**NWEA MAP – Northwest Evaluation Assessment Measures of Academic Progress** (A computerized assessment tool that is designed to measure a student’s achievement and academic growth, independent of grade, across time which will enable teachers to individualize instruction for each student.)

**NYSSBA – New York State School Boards Association** (Serves as the statewide voice of more than 700 boards of education. The collective influence of some 5,000 school board members, who constitute half the elected officials in the state, enables the Association to work toward the benefit of the elementary and secondary public school system in New York State.)

**NYSAA - New York State Alternate Assessment** (A part of the New York State Testing Program that allows students with severe cognitive disabilities to demonstrate their performance toward achieving the New York State learning standards.)

**NYSUT - New York State United Teachers** (A 600,000-member New York state teachers union, affiliated since 2006 with the American Federation of Teachers (AFT), the AFL-CIO, and the National Education Association (NEA). NYSUT is an umbrella group which provides services to local affiliates in New York state; lobbies on the local, state and federal level; conducts research; and organizes new members.)

**PARCC - Partnership for Assessment of Readiness for College and Careers** (A consortium of 23 states working together to develop a common set of K-12 assessments in English and math anchored in what it takes to be ready for college and careers.)

**PBS/PBIS - Positive Behavior Supports/Positive Behavior Intervention and Support** (A decision making framework that guides selection, integration, and implementation of the best evidence-based academic and behavioral practices for improving important academic and behavior outcomes for all students.)

**PDP - Professional Development Program**
PFO – Parent Faculty Organization

PLA - Persistently Low Achieving (Beginning with the 2010-2011 school year and thereafter, the commissioner shall place under preliminary registration review a school that is identified as persistently lowest-achieving in such school year.)

PLC – Professional Learning Community (Teachers and administrators in a school who continuously seek and share learning and then act on what they learn. The goal of their actions is to enhance their effectiveness as professionals so that students benefit.)

PRIM – Pre-Referral Intervention Manual (A comprehensive text with interventions to attempt before referring a student to the RII team.)

PSAT/NMSQT - Preliminary SAT/National Merit Scholarship Qualifying Test (A standardized test administered by the College Board and National Merit Scholarship Corporation [NMSC].)

QIP - Quality Improvement Process (Identifies district specific school improvement activities including school improvement goals, targeted improvement activities, and assessment of progress toward improving student outcomes is used to document and monitor results.)

RCT - Regents Competency Tests (Exit exams given to identified special education students with IEPs or students with a 504 plan seeking a high school diploma but cannot pass the standard Regents exams. Like the Regents Exams, the RCT is provided and overseen by NYSED, and is designed and administered under the authority of the Board of Regents.)

RIT - Rasch Unit (Scale scores from MAP that correspond to the various proficiency levels for each subject and for each student grade. These studies also estimate the probability that a student with a specific RIT score would achieve a status of “proficient” or better on her/his state test.)

RTI - Response to Intervention (A method of academic intervention used to provide early, systematic assistance to students who are having difficulty learning.)

RTTT - Race to the Top (Also abbreviated as R2T, RTTT or RTT, it is a $4.35 billion United States Department of Education contest created to spur innovation and reforms in state and local district K-12 education. It is funded by the ED Recovery Act as part of the American Recovery and Reinvestment Act of 2009.)

SAT - It was first called the Scholastic Aptitude Test, then the Scholastic Assessment Test, but now SAT does not stand for anything, hence it is an empty acronym. It is a standardized test for college admissions.

SCEP - School Comprehensive Education Plan

SED – State Education Department

SIG - School Improvement Grant
SGP – Student Growth Percentile (A number that represents a student’s score on the MAP in relation to other students who had the same score on the initial assessment.)

SINI – Schools in Need of Improvement

SLO – Student Learning Objectives (New York State will assess the student learning growth of students in classrooms where there is no State assessment that can be used for a State-provided growth or value-added measure. An SLO is an academic goal for a teacher’s students that is set at the start of a course. It represents the most important learning for the year (or, semester, where applicable). It must be specific and measurable, based on available prior student learning data, and aligned to Common Core, State, or national standards, as well as any other school and District priorities. Teachers’ scores are based upon the degree to which their goals were attained.)

SMART - Specific, Measurable, Attainable, Relevant and Timely

SOP – Standards of Practice

SQR - School Quality Review (A two- or three-day school visit by experienced educators to each New York City school. During the review, the external evaluator visits classrooms, talks with school leaders, and uses a rubric to evaluate how well the school is organized to support student achievement.)

SRO/CRO - School Resource Officer/Community Resource (Commissioned law enforcement officers assigned to schools.)

STEM - Science, Technology, Engineering and Math

STING – Successful, Thoughtful, Involved, Never Give Up, and Graduate (Southside’s focus for PBS.)

SWD – Students With Disabilities

TALC - Teacher Administrator Liaison Committee

TCI - Therapeutic Crisis Intervention (A crisis management protocol developed by Cornell University with the purpose of providing crisis prevention and intervention through intensive training and certification of staff.)

TIF - Teacher Incentive Fund

VADIR – Violent and Disruptive Incident Report (New York State’s system of classifying and recording incidents that impact student safety and security.)

VESID - Vocational and Educational Services for Individuals with Disabilities (A program which provides the opportunity for disabled New Yorkers to become independent through employment. VESID is an office of the New York State Education Department.)

504 - The "504" in "504 plan" refers to Section 504 of the Rehabilitation Act and the Americans with Disabilities Act, which specifies that no one with a disability can be excluded from participating in
federally funded programs or activities, including elementary, secondary or postsecondary schooling. "Disability" in this context refers to a "physical or mental impairment which substantially limits one or more major life activities." This can include physical impairments; illnesses or injuries; communicable diseases; chronic conditions like asthma, allergies and diabetes; and learning problems. A 504 plan spells out the modifications and accommodations that will be needed for these students to have an opportunity perform at the same level as their peers.
Useful websites for mathematics teachers

- Algebra Curriculum (Common Core):  http://www.emathinstruction.com
- Resources for Algebra, Geometry, and Algebra II/Trig: http://jmap.org
- Entire Common Core Curricula for NYS grades K-12:  https://www.engageny.org
- Great videos with examples on many topics:  http://patrickjmt.com
- Site has practice for all NYS high school regents exam courses:  http://regentsprep.org
- Great resource for videos on almost every topic:  http://www.khanacademy.org
- Video lessons for the new standards:  http://www.khanacademy.org
- An open marketplace for teaching materials, buy or sell:  http://www.teacherspayteachers.com
- Algebra Curriculum (non-Common Core):
  http://teacherweb.com/NY/Arlington/AlgebraProject/hf0.aspx
- Calculator emulator for computers, tablets, and smart phones:  www.wablit.codeplex.com
- PhET Simulations:  http://phet.colorado.edu

Useful Websites for Physics Teachers

- www.physicsclassroom.com
- https://phet.colorado.edu/en/simulations/category/new
Useful Websites for Biology teachers

Biointeractive: http://www.hhmi.org/biointeractive

Interactive science labs: http://www.edheads.org/

Interactive science labs: http://phet.colorado.edu/

Virtual biology labs: http://www.mhhe.com/biosci/genbio/virtual_labs/

Genetics stuff: http://learn.genetics.utah.edu/

Website to send text messages to students: https://www.remind.com/

Annenberg interactives: http://www.learner.org/interactives/

Virtual labs from Nobel Prize: http://www.nobelprize.org/educational/

Whiteboard interactives: http://www.freezeray.com/index.html

Virtual Labs site: http://webadventures.rice.edu/

Animations: http://www.footprints-science.com/
Useful Websites for Chemistry Teachers

- PhET Simulations - https://phet.colorado.edu/en/simulations/category/chemistry
- Institute for chemical education - http://ice.chem.wisc.edu/
- GPB Education - http://www.gpb.org/chemistry-physics/students/all
- TIGER - http://www.dlt.ncssm.edu/tiger/chem4.htm
- Veritasium - https://www.youtube.com/user/1veritasium
- American Association of Chemistry Teachers - http://www.teachchemistry.org/content/aact/en.html
- Mark Rosengarten - http://www.markrosengarten.com/
- Mr Guch Chemistry - http://misterguch.brinkster.net/
- Greenbowe Chemical Education - http://group.chem.iastate.edu/Greenbowe/ig-research.html
- Evan’s Chemistry Corner - http://www.evanschemistrycorner.com/
- CK-12 http://www.ck12.org/chemistry/
- Chemistry Crash Course - https://www.youtube.com/playlist?list=PL8dPuualJXtPHzzYuWv6fYEaX9mQQ8oGr
- Chem Collective - http://chemcollective.org/scenario_based
Useful websites for Middle School Science teachers

- http://www.pbs.org/wgbh/nova/
- http://www.pbs.org/wnet/nature/
- http://www.bscs.org/
- http://www.iris.edu/hq/programs/epo
- http://mw.concord.org/modeler/showcase/index.html
- http://phet.colorado.edu/
To be successful in Chemistry you need GRIT!

1) What is your current definition of Grit?

________________________________________________________________________

Watch Angela Lee Duckworth speak about Grit at a Ted Talk.

2) Jot down her definitions of Grit. There are several. Write them all!

3) Which of the above most resonate with you.

________________________________________________________________________

4) What evidence does she present that shows Grit as being important to success?

________________________________________________________________________

5) What do you think was the most shocking thing she stated?

________________________________________________________________________

6) Explain why you do or why you do not agree with her definition of Grit?

________________________________________________________________________

7) Describe an example of a situation that shows you have Grit.

________________________________________________________________________
8) Based on the above, are you a "Grittier Kid"? Give evidence to support your answer.


9) Based on the growth mind-set, you “need to be willing to fail and start over again with lessons learned” in order to be gritty and succeed. Explain if you agree or not with this statement.


10) Explain how you think you will react if or when you get a grade in chemistry that does not match your expectations for success.


11) Write what success in chemistry means to you.


12) Write a Strategy for achieving the above success using the fill in the blank strategy below as a guide. Make it silly, something that you’ll remember, but also be specific. Think of this sentence as something that will guide your work in chemistry. All you have to do is accomplish what you said.

I am going to learn (subject, topic, concept) because (YOUR REASON) and this is important for (activity, demographic, behavior).

Fill in blanks and rewrite below:


Design

All discussions must be in the impersonal form; no pronouns at all.

In the beginning

- Descriptive title – What are you investigating? Do not just restate the teacher’s question.
- Dates - when done & when submitted
- Lab Partners (if any)

Purpose

This is a very specific statement of the problem or research question.

Background

- Discuss the chemistry behind what you are investigating; discussion on the theory to support your hypothesis.
- Include: basic definitions and concepts, terms, actual values. You will need this to support hypothesis in conclusion.

Hypothesis

The hypothesis must be a specific/clear prediction that is testable. It predicts the relationship between the independent and dependant variables. It is usually in the form: “If Y is done, then X will occur”

Variables

- List variables and explain why they are important (refer to Background)
- Independent – this is the variable that you are changing/manipulating
- Dependant – this is the variable that is responding to the change; usually the data you are collecting.
- Controls – the things that are held the same throughout the experiment to ensure a fair test

Materials

Include sizes of glassware used, uncertainty of instruments, molarity of solutions.

Ex. If need 3 beakers and each is 100 mL, state: “3x 100mL beakers”

If using an electronic scale, state: “Electronic scale, +/- 0.001g”

Which type of thermometer are you using? Indicate if glass or Vernier and include uncertainties

Procedure:

- Directions must be in a step-wise chronological order. Numbered steps are best.
Write directions for someone to be able to follow even if they have no chemistry background.

In other words, don’t assume previous knowledge. State how data is to be collected, how to manipulate the independent variable.

State precisely how you will vary the independent variable.

State how you are going to measure or observe the dependent variable. Indicate how many trials will be made.

There must be provisions for at least 3 trials for each manipulated variable. Include how many different and suitable readings you need.

It does not matter if you do not accomplish all trials in reality, but you must plan for them.

State clearly and exactly what you will do so that any other student could follow your plan.

Take into account the fact that you are trying to collect precise and reliable data.

Data Collection

Record ALL relevant data and observations

Include quantitative data (e.g., measurements of temperature, mass, volume, absorbance, pressure—all with appropriate units)

Include qualitative observations (e.g., “the final color at the endpoint was a faint pink”, during the reaction, the bromine water changed from being a bright yellow to solution of no color”

Report any changes in procedure or unusual conditions.

All data recorded should be to the greatest possible number of significant figures that the accuracy of the equipment allows. Every experimental value has some uncertainty associated with it. The amount of uncertainty depends on two things: the precision of the instrument used to make a measurement, and the skill of the person using the instrument.

Include uncertainties for all raw data in the data table.

Consider uncertainties and errors in your measurements and deal with it properly.

Make sure that someone else could understand exactly what your data means.

All tables and graphs should be clearly identified and labeled.

Include appropriate qualitative raw data is recorded. (e.g., color changes, reactivity, odors, texture changes...)

Remember...Presentation must be well organized and easy to interpret.

Graphing experimental data

All graphs should have a descriptive title ("Graph" is not a title)

Both axes should have labels and units clearly marked.

There should be a table in which the data values are listed. Don’t put data in a graph unless you have first listed it in a table.
The controlled or independent variable is placed on the horizontal axis. The dependent variable is graphed on the vertical axis.

Data Processing and Presentation

- Always process and show results mathematically. Include equation/s used. Propagate any uncertainties. Show rules for adding/subtracting, multiplying/dividing.
- Convert tabulated data into a graphical form, if appropriate.
- Convert drawings into diagrams.
- Include analysis of any errors.
- Quality of layout should be orderly and easy to follow.
- Include a brief caption/summary of each table or graph directly below it.
- Data tables must be contained on one page; not split between pages.

Conclusion.

- Restate the original hypothesis.
- Discuss the original hypothesis and explain whether your prediction came true. If not, you will need to give reasons why your predictions did not come true.
- Summarize your findings. This includes all calculated values from data tables. Include both experimental and true values.
- Use detailed scientific knowledge to explain a valid conclusion given the evidence available from your results.
- Explain differences in your data versus expected results or literature results. Cite sources.
- Explain how your results support or don’t support your original hypothesis.
- Can the difference between the experimental and literature value be explained in terms of the uncertainties of the measurements or were other systematic errors involved?
- Include percentage error. Discuss/explain error sources. Explain how errors may have affected your results.
- Explain how the equipment might you used/school environments have limited the accuracy of your results.
- State how the weaknesses in your method might have contributed to incorrect results.
- **Include systematic error.** Systematic errors occur as a result of poor experimental design or procedure. They cannot be reduced by repeating the experiments. It’s the error generated from the equipment’s uncertainty. That is why we propagate the uncertainty; compare the propagate uncertainty to percent error. If the value is very large, one must use more precise equipment.
  - Heat losses in an exothermic reaction will lead to smaller temperature changes.
  - Systematic errors can be reduced by careful experimental design.
  - Measuring the volume of water from the top of the meniscus rather than the bottom will lead to volumes which are too high.
  - Do not include “human error”, “math error”, or “time constraints”

- **Include random error.** When an experimenter approximates a reading, there is an equal probability of being too high or too low. Errors can be reduced through repeated measurements. Duplicate experiments when designing experiments, to reduce random error.
  - The readability of the measuring instrument
  - Insufficient data
- The effects of changes in the surroundings such as temperature variations and air currents
- The observer misinterpreting the reading

*Do not include* "human error", "math error", or "time constraints"

- Clearly state if the systematic errors are larger or smaller than the random errors and if the experimental result is within the random errors range.
- Discuss possible improvements or modifications. For each error listed above, you need to include an improvement. You cannot just say something, and not explain it.
- Include improvements you could make to your plan to overcome the weaknesses you have identified.
- State what further investigations would you suggest to test your conclusions.

DO NOT include superficial error/improvements. (clean glassware, contaminated raw material, drafts...
Your Mission: To make 2 types of slime with the following characteristics:

- "A" slime needs to be able to reach a height of 20 cm when bounced, maintain its elasticity when stretched to 5 cm, maintain its shape even when heated to 30°C, and be purple in color.
- "B" slime must not hold its shape under any circumstances even when temperatures drop below 10°C. It needs to be neon green in color and have a density between 0.5 g/ml and 1.5 g/ml.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
<th>Point Value (out of 100)</th>
<th>Points Earned</th>
</tr>
</thead>
</table>
| Title page  | - Mission Title  
- Your name and lab #, your lab partner's name, date | 1 | |
| Background  | - Brainstorm with your partner about the topic, writing down your prior knowledge about slime, chemical/physical properties, the composition of matter, and attractive forces between particles  
- Why might the slime industry be interested in producing two types of slime?  
- Use the library bookmarks to your advantage. | 15 | |
| Purpose/Goal | - Specifically describe the goal(s) of this experiment. | 4 | |
| Hypothesis  | - Use the slime lab that you completed previously to predict which ingredient(s) is(are) critical to slime A and B.  
- Predict the types of tests will you have to do to achieve your goals.  
- STOP HERE and check progress with Ms. Anastasio. | 6 | |
| Variables   | - State your independent and dependent variable(s) for every test.  
- List your control(s) for every test. | 9 | |
| Materials   | - List all materials/equipment required.  
- Check with instructor about availability. | 3 | |
| Procedure   | - Step by step instructions that anyone could follow (written in third person) for every test. | 12 | |
| Results     | - Data table(s) and graph(s) that include qualitative and quantitative results (be sure to note any unexpected observations).  
- Use Excel for all of the above.  
- STOP HERE and check progress with Ms. Anastasio. | 24 | |
| Conclusions | - Did you achieve the mission? Give evidence to support your answer.  
- Relate the hypotheses to your results and then relate results to concept(s) discussed in class. (Refer to your background.)  
- If you did not achieve the mission, why not? What were your sources of error?  
- You’re a perfectionist. What would you do differently if you had to produce these types of slime in a manufacturing facility for the general public? What would you do in the same way?  
- Describe/explain the environmental impact of making both slimes. Is one more environmentally friendly than the other? What happens to it after it ends up in the landfill? | 24 | |
| References  | - Citations  
- If you skip this section, you automatically get a 0. | 2 | |
Remember the process of scientific inquiry...

EXPLORATION
AND DISCOVERY

Making observations
Asking questions
Sharing data and ideas
Finding inspiration
Exploring the literature

Gathering data
Hypotheses
Expected results/observations
Actual results/observations

Interpreting data
Supportive, contradictory, surprising, or inconclusive data may...
...support a hypothesis.
...oppose a hypothesis.
...inspire revised/new hypothesis.
...inspire revised assumptions.

TESTING IDEAS

BENEFITS AND OUTCOMES
Develop technology
Address societal issues
Build knowledge
Satisfy curiosity
Inform policy
Solve everyday problems

COMMUNITY ANALYSIS AND FEEDBACK
Feedback and peer review
Replication
Discussion with colleagues
Publication
Coming up with new questions/ideas
Theory building
Investigate Heat Energy

In this exercise you are asked to investigate a property of heat energy. You must choose the system or chemicals and the property you wish to investigate. I can give you no other input than the items listed below.

Points to Ponder:
*In order to get full credit on this lab you must address the following points:*

1. A clearly defined research question must be stated, including background information, with cited sources.
2. A hypothesis with a testable consequence must be presented.
3. You must carry out an appropriately planned set of experiments, accounting for all variables, which include: independent, dependent and controlled variables.
4. Based on background research, experimental design must be original.
5. Data and results must be displayed in labeled tables, with uncertainties on all measured and derived data appropriately noted. Include both quantitative and qualitative data.
6. Sample calculations for both data and error propagation must be included.
7. The results and discussion must directly address the stated hypothesis. If appropriate, relate discussion and findings to background information.
8. Discussion of your results must include a complete and meaningful analysis of errors. This means, for example, simply listing “human error” or “better equipment needed” is not acceptable.
9. Conclusion must include:
   * Summary of results, comparing values to literature values.
   * Discussion of error, including both random and systematic error
   * Meaningful discussion of how to improve lab
10. All conclusions must be based on your data, and not what you think “should have happened”.
11. Carefully consider the guidelines on the lab evaluation rubric and pay attention to meeting all the requirements for full credit.
# Lab Rubric

<table>
<thead>
<tr>
<th>Lab Sections</th>
<th>Points Earned</th>
<th>Points Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heading:</strong> Name, Lab Partners, Date &amp; Title: Clear Statement of Intent (less than 10 words)</td>
<td>______ / <em><strong>1</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Purpose/Objective:</strong> Very specific statement of the problem, posing of the question</td>
<td>______ / <em><strong>1</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Background:</strong> Research information that may be needed during experiment or that explains why the investigation is of interest to you/community/world.</td>
<td>______ / <em><strong>3</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Hypothesis:</strong> A specific/clear prediction that is testable. (will be able to say Yes or No ......., occurred)</td>
<td>______ / <em><strong>1</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Variables:</strong> state and explain necessity of each - Independent Variable - Dependent Variable - Controls</td>
<td>______ / <em><strong>2</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Materials/Equipment List:</strong> bulleted list of equipment and materials needed for test</td>
<td>______ / <em><strong>1</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure:</strong> Generally written in third person. Detailed enough that someone could repeat experiment. If following a given procedure specify and clearly state any modifications you made.</td>
<td>______ / <em><strong>2</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Results:</strong> Raw Data: Both Quantitative (#s in table format) with uncertainties and Qualitative (Lists of descriptive observations). Pictures/Diagrams.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Processed Data:</strong> Show example calculations, include rules used (again w/ uncertainties included)</td>
<td>______ / <em><strong>4</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>Conclusion:</strong> Restate/discuss original hypothesis and whether your prediction came true. Summarize your findings. Explain differences in your data vs. expected results or literature results. (cite sources) Discuss/Explain error sources: systematic &amp; random explain how errors may have affected your results Discuss possible improvements/modifications</td>
<td>______ / <em><strong>4</strong></em></td>
<td></td>
</tr>
<tr>
<td><strong>References:</strong> Cite sources used</td>
<td>______ / <em><strong>1</strong></em></td>
<td></td>
</tr>
</tbody>
</table>

**Total:** ______ / ______
Isotopes
Are all atoms of an element alike?

Why?
The following activity will help you learn the important structural characteristics of an atom. How do we classify atoms? How does the combination of subatomic particles affect the mass and charge of an atom? What are isotopes? This is just a sampling of what we will address. Throughout this activity you will want to keep both Model 1 and a periodic table handy.

### Model 1

#### Isotopes of Hydrogen

<table>
<thead>
<tr>
<th>Symbol</th>
<th>$^1$H</th>
<th>$^2$H</th>
<th>$^3$H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomic Diagram with Name</td>
<td>Hydrogen-1 (protium)</td>
<td>Hydrogen-2 (deuterium)</td>
<td>Hydrogen-3 (tritium)</td>
</tr>
<tr>
<td>Number of Protons</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Number of Neutrons</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

#### Isotopes of Carbon

<table>
<thead>
<tr>
<th>Symbol</th>
<th>$^{12}$C</th>
<th>$^{13}$C</th>
<th>$^{14}$C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomic Diagram with Name</td>
<td>Carbon-12</td>
<td>Carbon-13</td>
<td>Carbon-14</td>
</tr>
<tr>
<td>Number of Protons</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Number of Neutrons</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

#### Isotopes of Magnesium

<table>
<thead>
<tr>
<th>Symbol</th>
<th>$^{24}$Mg</th>
<th>$^{25}$Mg</th>
<th>$^{26}$Mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomic Diagram with Name</td>
<td>Magnesium-24</td>
<td>Magnesium-25</td>
<td>Magnesium-26</td>
</tr>
<tr>
<td>Number of Protons</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Number of Neutrons</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
1. Refer to Model 1. What subatomic particles do the following symbols represent in the Atomic Diagrams?

2. Complete the table in Model 1 by counting the protons and neutrons in each atomic diagram. Divide the work evenly among group members.

3. Find the three elements shown in Model 1 on your periodic table.
   a. What whole number shown in Model 1 for each element is also found in the periodic table for that element?
      Hydrogen — Carbon — Magnesium —
   b. The whole number in each box of the periodic table is the atomic number of the element. What does the atomic number of an element represent?

   c. Refer to the isotope symbols in Model 1. Relative to the atomic symbol (H, C, or Mg), where is the atomic number located in the isotope symbol?

4. Refer to your periodic table.
   a. How many protons are in all chlorine (Cl) atoms?

   b. A student says "I think that some chlorine atoms have 16 protons." Explain why this student is not correct.

5. Refer again to Model 1. In the isotope symbol of each atom, there is a superscripted (raised) number. This number is also used in the name of the atom (i.e., carbon-12). It is called the mass number.
   a. How is the mass number determined?

   b. Why is this number called a "mass" number?
6. Fill in the table for Atom I and Atom II shown below.

<table>
<thead>
<tr>
<th></th>
<th>Atom I</th>
<th>Atom II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Protons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Neutrons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass Number</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Atom I

Atom II

7. Refer to Model 1.
   a. Which corner of the isotope symbol contains the mass number?

   b. How is the mass number of an isotope expressed in the name of an atom?

8. Write an isotope symbol (similar to those in Model 1) for each of the atoms in Question 6.

9. Write the name of the atom (similar to those in Model 1) for each of the atoms in Question 6.

10. Fill in the following table.

<table>
<thead>
<tr>
<th>Isotope Symbol</th>
<th>$^{40}_{19}$K</th>
<th>$^{18}_{9}$F</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Atomic Number</td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Mass Number</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Protons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Neutrons</td>
<td></td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>

11. Consider the examples in Model 1.
   a. Do all isotopes of an element have the same atomic number? Give at least one example or counter-example from Model 1 that supports your answer.
b. Do all isotopes of an element have the same mass number? Give at least one example or counter-example from Model 1 that supports your answer.

12. Considering your answers to Question 11, write a definition of isotope using a grammatically correct sentence. Your group must come to consensus on this definition.

STOP

13. Consult the following list of isotope symbols: $^{208}\text{Pb}$, $^{82}\text{Br}$, $^{78}\text{Br}$, $^{208}\text{Pb}$, $^{204}\text{Pt}$, $^{205}\text{Pb}$.

a. Which of the atoms represented by these symbols are isotopes of each other?

b. Which part(s) of the isotope symbol was the most helpful in answering part a of this question?
Extension Questions

14. Determine the number of electrons in each of the atomic diagrams in Model 1.
   
   a. In a neutral atom, how does the number of electrons compare to the number of protons?
   
   b. Discuss why this relationship is important in making a "neutral" atom.

15. Refer to the hydrogen isotopes in Model 1. Each isotope has a special name derived from Latin (protium, deuterium, and tritium). What structural feature do these names refer to in the atom?

16. Can two atoms with the same mass number ever be isotopes of each other? Explain.

17. All models have limitations. What characteristics of Model 1 are inconsistent with your understanding of what atoms look like?
WHO MADE THE FIRST ICE CREAM? Historians can't say for sure. Some say that Marco Polo first tasted a soothing new food in the courts of Kublai and brought recipes for "milk ice" back to Italy. Later, Catherine de Medici's chef concocted delicious "fruit ices." Perhaps the first true ice cream made in the West was the "creme froz" served at the coronation feast of King Henry V of England.

For decades, ice cream was the rarest of treats because it was so difficult to make. Then, in 1846, Nancy Johnson invented the hand-cranked ice cream freezer that made it possible for anyone to make ice cream at home. Five years later, Jacob Fussell opened the first commercial ice cream factory in Baltimore, Maryland, and the rush for our favorite dessert was on.

Why is ice cream so popular? Probably because it combines the rich buttery taste of cream, the irresistible sweetness of sugar, and the soothing coolness of ice. The ingredients couldn't be simpler: cream, milk, sugar, air, and flavoring. But the problems start when the ingredients are mixed with cream.
Cool Chemistry

Cream consists of oily butter fat and water, with the remainder lactose, proteins, and minerals. Normally, oil and water refuse to mix, with the oil floating on top of the water. Cream does not separate this way because each microscopic droplet of butterfat is surrounded by a protein membrane that attracts water molecules.

Sugar can easily be added to cream because it dissolves well in water. If cream is stirred very gently while sugar is added, it is possible to make a sweet, rich liquid. But to make ice cream, you must stir the mixture vigorously to fluff it up with air. Unfortunately, this breaks the protein membranes surrounding the butterfat droplets. The butterfat is set free and, if nothing prevents it, rises and forms an oily layer on the surface. Not a pleasant dessert. A remedy to this problem is to add an emulsifier—a chemical that helps oil mix with water. One natural emulsifier that is found in egg yolks is lecithin.

The liquid that is churned and chilled is not a solution but a colloid. In a solution, the different ingredients dissolve into tiny particles less than 1 nanometer (nm) in diameter. In a colloid, the particles are larger, up to 100 nm, though they are still invisible without an optical microscope. If you cool the colloidal liquid to about 10°C and make some provision for continuously adding air bubbles, you need only stir and stir and stir. A liquid that holds lots of trapped air bubbles is a foam. This means that, technically, when the ice cream finally freezes, you have made a frozen colloidal foam.

Under a microscope, frozen ice cream shows four distinct regions or phases:

- a syrup of sugar, salts, and proteins
- droplets of milk fat
- pockets of air
- tiny ice crystals

Each phase contributes to the taste and texture of the ice cream. The ice crystals stabilize the foam and form a strong framework that holds the other phases in place. The air pockets interrupt the liquid and solid phases and make the ice cream smoother and lighter. Ice cream with no air is very hard to scoop and eat. The amount of air that is whipped into ice cream is called “overrun.” A 100% overrun means that the air has expanded the ice cream to twice its original volume. The syrup, which remains liquid, prevents the ice cream from becoming as hard as a block of ice. The milk fat adds richness and carries some of the other flavors.

Commercial ice cream, which must be stored and shipped before being eaten, can suffer the dreaded “heat shock.” If ice cream melts even partially and then re-freezes, the ice crystals grow larger and may invade the air pockets. This makes the texture distinctly grainy. To reduce this effect, manufacturers add stabilizers—compounds in the syrup that cling to the water molecules and keep them from attaching to the ice crystals. Some of the most effective stabilizers have long, chainlike molecules with water-attracting polar ends.

Each gallon must weigh at least 4.5 pounds. Homemade ice cream usually weighs twice that amount. The weight reflects the amount of “overrun” or air added. The maximum amount allowed is 100%. Cheaper ice creams have smaller amounts of milk fat, larger overrun, and lower weight.

Federal regulations specify that ice cream must contain at least 10% milk fat and at least 20% total milk solids, including milk fat, proteins, lactose, and minerals. The maximum amount of stabilizer permitted is 0.5% by weight, and the maximum amount of emulsifier is 0.2%.
groups. Commercial manufacturers prefer vegetable gums, such as locust bean and guar gums. If you make ice cream at home, adding gelatin gives some of the same effect.

The most popular flavor of ice cream is vanilla. The flavoring is a minuscule fraction of the ingredients but a large part of the eating experience. Traditionally, vanilla was extracted from the beans of the plant *Vanilla planifolia*, a member of the orchid family. (See *Chem Matters* article “Vanilla,” April 1988.) The compound that carries the distinctive vanilla flavor is known as vanillin. Vanillin is a volatile chemical that vaporizes readily when warmed.

It is easy not to appreciate our favorite dessert. When you take a bite of vanilla ice cream, you first experience a cool, sweet sensation from the ice and sugar. As the heat of your mouth warms the ice cream, it softens and you notice the second taste—the buttery-rich dairy flavor. Then as the vanillin vapor fills your nostrils with its familiar aroma, you enjoy the rich harmony of aromas, tastes, and textures that we know as vanilla ice cream.

FOR FURTHER INFORMATION
Homemade Ice Cream

You'll need an ice cream freezer, either hand cranked or motorized:
In a large bowl, mix 1 can condensed milk, 2 tablespoons vanilla, 6 eggs, and 2 cups sugar.
Stir to dissolve the sugar. Pour the mixture carefully into the metal container that comes with the freezer.

Add whole milk up to the mark on the container (about 1/2 gallon milk) for most ice cream makers. Insert the dasher and secure the lid on the container.

Put a small amount of water in the bottom of the ice bucket to keep the ice cream container from freezing to the bottom of the bucket. Place the ice cream container into the bucket and attach the motor or crank. Add about 4 handfuls of ice, then sprinkle about 1/2 a handful of common rock salt (sodium chloride) over the ice.
Continue adding ice and salt to a level just below the lid of the ice cream container. If possible, insert a thermometer into the ice-salt mixture and record the temperature.

Crank (or turn on the motor) for 10 minutes. Stop cranking and measure the temperature again. The temperature of the brine (water-salt) solution can drop well below the usual freezing point of water. Continue cranking and taking temperature readings at 10-minute intervals. Stop when the crank becomes too hard to turn (or the motor bags down).

Scrape the ice off the lid and remove the dasher. If time permits, replace the lid and repack the freezer with more salt and ice to allow the ice cream to harden for about 30 minutes before eating.

Pure water freezes at 0°C, but the mixture used to make ice cream freezes at about -3°C. Water freezes at 0°C, which means that ice water is not cold enough to make ice cream. So how can we freeze ice cream with ice? By controlling the balance of freezing and melting. When a substance melts, it absorbs heat and cools the surroundings. When it freezes, heat is released to the surroundings. In a container of pure water and ice, there is a balance between freezing and melting that keeps the mixture at 0°C. But adding salt changes the balance.

When an ice cream freezer is started, friction of the rotating can as well as the warmer ice cream mixture in the can melts some of the ice packed around the can, releasing a small amount of water and slightly cooling the can. In a normal ice-water mixture, much of this water would refreeze and slightly warm the can. The salt, however, acts as an antifreeze for the water, blocking both the refreezing and its warming effect.

Each gram of ice that melts causes 334 Joules of cooling. If you use one part salt to three parts ice (by weight), the resulting brine can drop to -2°C. A 1:5 mixture requires a lot of salt, so a 1:3 ratio is commonly used to start making ice cream; more salt may be added later.

The December 1995 issue of the Chem Matters Classroom Guide explains how to make a small amount of ice cream with plastic bags instead of an ice cream freezer.

ChemMatters – Making Ice Cream Dec 1995

A. Guided Reading Questions:

1. Who and when was the first hand cranked ice cream freezer invented?

2. Who and where was the first commercial ice cream factory opened?

3. What are the main ingredients needed to make ice cream?

4. Why are oil and water able to mix together in the cream (this defies the rule “like dissolves like”)?

5. How do colloids differ from solutions and suspensions?

6. When ice cream is made, air is whipped into the mixture. Although it seems that you are getting less ice cream for your money (because the air can legally occupy up to one-half of the volume of the ice cream), the “overrun” does serve a useful purpose. What is the role of air pockets in ice cream?
7. Emulsifiers...

<table>
<thead>
<tr>
<th>What is an emulsifier?</th>
<th>Give an example and indicate where it is found.</th>
<th>Why is an emulsifier needed to make ice cream?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Describe what is meant by “heat shock” in terms of particles and in terms of the product quality.

9. Heat shock can be reduced by adding stabilizers. Give an example of a stabilizer and explain how it helps to solve the heat shock problem.

10. What is the most popular flavor of ice cream? ________________________________

11. What does it mean for “vanillin is a volatile chemical” and how does this work to make us “taste” the vanilla flavor?

12. What are the three main fatty acids in milk?
13. Explain the role that salt plays in making homemade ice cream.

14. How much energy, in joules, is needed to melt one gram of ice? ____________

15. What do the following have in common with this article?
   Antifreeze, chemicals that melt ice and snow on sidewalks, tree sap, ocean water.

16. Look at the following ice cream label. See if you can determine the role each ingredient plays in the manufacture of this particular ice cream.

Nutrition Facts

<table>
<thead>
<tr>
<th>Serving Size</th>
<th>Calories</th>
<th>Total Fat</th>
<th>Saturated Fat</th>
<th>Trans Fat</th>
<th>Cholesterol</th>
<th>Sodium</th>
<th>Total Carbohydrate</th>
<th>Sugars</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120</td>
<td>4g</td>
<td>1g</td>
<td>0g</td>
<td>0mg</td>
<td>320mg</td>
<td>16g</td>
<td>12g</td>
<td>3g</td>
</tr>
</tbody>
</table>

Who came up with this label anyway? ________________

How big is a cup in moles? ________________

There are 0.24 calories in 1 joule. How many joules of energy will you receive by eating one serving of this ice cream? ________________

The big 3 nutrients.

What are daily values? ________________

This is the guideline for planning a healthy diet.

Calories per gram of the big 3 nutrients.

The ingredients are listed in order. What is this order? ________________

Identify the function of some of the ingredients listed.
17. There was a dispute in the news a few years back about who was the first state to put together the ice cream sundaes. Look on the internet and see if they have settled this dispute and determined who is credited with developing the ice cream sundaes.

18. Describe what function each of the following ingredients plays in making ice cream so scrumptious.

<table>
<thead>
<tr>
<th>Sugar, Salts, Proteins</th>
<th>Milk Fat Droplets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Pockets of Air</td>
<td>Tiny Ice Crystals</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Interesting Facts About Ice Cream:**

1. The ice cream cone had its origin at the St. Louis World Exposition of 1904 when an ice cream vendor ran out of clean dishes. He borrowed wafers, sold at a nearby stand, to put his ice cream in. The vendor called it the World’s Fair Cornucopia.

2. In 1946 the annual consumption of ice cream per person in the US was just over 5 gallons, and this stands as the all-time record for US ice cream consumption.

3. Because ice cream is served cold, manufacturers must use twice as much sugar as they would need if it were served at room temperature. Cold numbs our taste buds, reducing their sensitivity, so to make the ice cream taste sweet to our dulled senses, more sugar is needed.
purpose: The purpose of this lab is to apply the steps and strategies from "cliff" type projectile problems. These are projectiles launched horizontally.

materials: track, marble, stopwatch, meter-stick, calculator, & target

background: If you have ever watched an action movie or TV show, you have probably seen a car, person or some other projectile launched off of a cliff. You will calculate the landing spot for a cliff projectile in this lab, and place your target where you predict the projectile will hit. Good Luck!

procedure: *DO NOT ROLL BALL OFF TABLE EDGE UNTIL YOU ARE DONE.*
1. Make any measurements you and your team decide to make with the equipment given.
2. Calculate the exact point of impact based on your measurements.
3. Call over Mr. Wilson when you have bulls-eye in position.

Data, calculations, procedure steps, and labeled diagram of lab setup:

analysis?’s:
1. Is this a Dukes or cliff projectile? _______ How do you know? Be specific.

2. How would $a_x$, $a_y$, $v_{ix}$, $v_{iy}$, $d_x$, and $d_y$ change with a higher lab table?

3. Which velocity component ($x$ or $y$) remains the same and why? Which one is constantly changing and why?

conclusion: Why did your projectile hit where it did?
Bulls-Eye Target Sheet
Part I—Some Headache...

"Hurry up in there, your sister has to use the bathroom too," said Sue Frost to her oldest child, eight-year-old Jonathan. Sue was rushing around the house as she did most other mornings trying to get herself ready for work as well as get the children ready for her husband to take to day care. Sue was the manager of a bank in a suburb of Seattle called Springville.

"Mommy," said five-year-old Allison, "Jon is taking too long in the bathroom." Sue had awakened with a slight headache and now her head was beginning to pound. "Jonathan, get out of the bathroom this instant," yelled Sue, "your sister needs to get ready to go to Humpty-Dumpty Day Care."

Sue went to the medicine cabinet in her bathroom to get something for her headache. She finished getting dressed, made sure the kids were ready to go, and went back to her bathroom to put on her makeup in preparation for leaving. She was found by her husband Henry a little while later collapsed on the floor. Henry dialed 911 and the dispatcher immediately sent an ambulance to their residence. When the paramedics arrived, they found Mrs. Frost gasping for breath and barely conscious.

"Mrs. Frost, can you hear me," said Joe, one of the paramedics on the scene. Joe spoke to his partner, "Bill, she doesn't appear to be responsive to sounds or light; any ideas?"

Bill called the physician on duty in the ER via his radio. The physician indicated that the symptoms suggested she might have experienced a ruptured aneurysm or a drug overdose from cocaine. However, the drug overdose explanation seemed improbable since Joe and Bill found no evidence of drugs at the scene. Later, tests at the hospital indicated that there had been no internal bleeding. Family and friends who were questioned subsequently about the incident confirmed the view of the paramedics on the scene. They told investigators that Mrs. Frost was not the kind of woman likely to use drugs.

Sue Frost got progressively less responsive in the ambulance and died a short time after arriving at the hospital.

Because of the uncertainty surrounding her death, an autopsy was performed by the county coroner, William Delaforte. During the autopsy, Steven Sheath, an assistant to the M.E., asked Dr. Delaforte, "Do you detect the faint odor of bitter almonds coming from the body?" Dr. Delaforte's positive response led both men to the conclusion that Sue Frost had been poisoned. Samples sent to the lab confirmed that she had been poisoned, by cyanide. Henry, as well as Sue's parents who lived in the area, insisted that she would never have committed suicide by poisoning herself. "She had everything to live for," they all said. Thus, no one had a reasonable explanation of what happened to Sue Frost.
"How had she ingested the cyanide?" This was the question asked by the M.E. to his staff and the members of Sue's family. Numerous possibilities were considered, from accidental ingestion of rat poison all the way to eating peach pits thinking they were almonds. After numerous failures to come up with a plausible solution it was decided that any over-the-counter medications that Mrs. Frost might have taken should be examined. Bingo! It turned out that the Extra-Strength Excedrin® pain reliever capsules she had taken for her headache earlier that morning were the source of the cyanide. A follow-up test confirmed that some of the capsules remaining in the bottle found in her medicine chest contained cyanide.

About four days later, Bristol-Myers, the manufacturer of Excedrin, contacted retail stores across the country and asked them to remove all bottles of Extra-Strength Excedrin from their shelves. In the interim, the local police had discovered two other bottles of cyanide-laced Excedrin, one in Springville and one in an adjoining suburb called Auburn Hills.

The case was quickly turned over to the FBI, which has jurisdiction over all cases involving product tampering. FBI investigators began their investigation assuming that the killer might be a political terrorist or perhaps a recently fired employee of Bristol-Myers. These suspicions faded when no one called to either take responsibility or issue demands from the company.

A break in the case occurred when the FBI received a call from the Seattle police about a woman who identified herself as Mrs. Stella Penny. Mrs. Penny had told the police the following story, "I heard about the Sue Frost cyanide poisoning on the local news and began to wonder if perhaps that is what happened to my husband Bart. He died suddenly 10 days before Mrs. Frost died and he too had taken Extra-Strength Excedrin capsules on the morning of his death. He regularly took pain relievers to help alleviate his persistent arthritis pain. Initially, I didn't think anything about it because he had respiratory problems so I assumed that he died from some complication resulting from his respiratory ailment. Later I began to wonder, could there be a connection between the two cases?"

Part II—A Suspect

A chemist in the FBI lab examined all of the tainted capsules that had been recovered so far and found something unusual; all of them contained particles of an algicide used in home fish tanks. The brand name of the algicide was even determined—Algae Destroyer™.

The FDA examined more than 740,000 capsules of the Extra-Strength Excedrin that had been sold in the Pacific Northwest and Alaska, and found only five bottles to be contaminated. Two of these five bottles had been recovered from Stella Penny's home. When asked about the bottles of Excedrin, Stella indicated that she had purchased them on different days from different stores.

The FBI's investigation included the questioning of neighbors and fellow employees of Stella Penny. All reported her to be a good neighbor and employee and indicated that she and her husband seemed to be happy. She was a grandmother with two daughters and was reported to have been devastated by her husband's death; she was described as inconsolable by some of her friends. However, the FBI soon began to consider Stella as a suspect in the case, not a victim of an unfortunate accident. As part of their investigation they also discovered a fish tank in Stella Penny's home.
Part III—The Case Begins to Unfold

FBI agents canvassed the local pet stores and found one that had a store clerk who remembered Mrs. Penny coming in to purchase some of the Algae Destroyer algicide from him. The store clerk unhesitatingly identified a picture of Mrs. Penny when shown a collection of photos of middle-aged women. He said he distinctly remembered her because she had a small bell attached to her purse that jingled as she walked around the store. He reported to investigators thinking at the time, "What a ding-a-ling, to walk around with a jingling bell attached to your purse."

The suspicions of possible involvement of Stella Penny in the death of her husband grew as the FBI did more background checks on her. It was discovered that Mrs. Penny had been convicted of check fraud, forgery, and child abuse while living in California in the late 60's and early 70's. She was no longer in trouble with the law but it was discovered that she and her husband had been in significant debt and that the bank was moving to foreclose on their home at the time of Bart's death. Being broke or living close to bankruptcy seemed to be the normal mode of existence for the Pennys.

However, investigators found that Stella had somehow managed to find the money to increase the insurance coverage on Bart's life. As a state employee, Bart had a $31,000 life insurance policy with an additional $105,000 of coverage should death result from an accident. Stella had increased the value of the policy with an additional $40,000 of accidental death coverage. Thus she stood to receive $176,000 if Bart should die accidentally.

The FBI also learned that Stella had called the doctor who had signed the death certificate to ask if he was positive that her husband had died from emphysema, the cause listed, or if he could have been mistaken in his findings.

Part IV—Daughter Talks

Stella was brought in for questioning some five months after the start of the investigation of Sue Frost's death. Mrs. Penny agreed to take a lie detector test during questioning to prove her innocence. When she took the test several days later and was asked, "Did you lace the capsules with cyanide," she responded emphatically, "No!" The polygraph indicated that she lied. She stopped answering questions at that point and requested a lawyer.

The real break in the case came when Stella's own daughter, Regina Hicks, told the FBI agents that her mother had often talked about killing Bart, even the possibility of hiring a hit man to do the killing. She also mentioned to her daughter the possible use of cyanide to murder her husband. Regina informed the agents that her mother had researched the effects of cyanide on humans at various libraries.
Part V—Library Visit

When the FBI canvassed all of the local libraries they found one record showing that Mrs. Penny had checked out and never returned a book entitled *Human Poisoning*. Upon additional investigation it was found that Stella also had checked out a book on toxic plants called *Deadly Harvest* on two different occasions prior to Bart’s death.

The book, *Deadly Harvest*, was sent to the FBI lab and checked for fingerprints. Eighty-four of Mrs. Penny’s prints were lifted from the pages of the book, most from the section that dealt with cyanide and its effects on animals.

Stella Penny was indicted on December 9, 1987 and was tried the following April. She was convicted on May 9, 1988 and sentenced to 90 years of imprisonment.
Be able to sex a pig
External Anatomy- nares, auricle, thorax, abdomen, umbilical cord, dorsal, ventral, caudal
Be able to recognize the four types of tissue
Muscles (human diagram) see pg 727 of book
Bones (human diagram) see pg 722 of book
Heart (sheep) (pg 598) book4 chambers, 4 valves
Brain (sheep) cerebrum, cerebellum, medulla oblongata, limbic system, spinal cord
Kidney (sheep) (pg 670) book, cortex, medulla, pelvis, calyx
Internal Anatomy (any structure is possible)

Practice quizzes on my web page!!!!
Brandon Coston is my favorite son.
Heart sounds:
In a quiet room, listen with a stethoscope to the sounds of your heart, and those of your laboratory partner. The best place to hear the heart sounds is on the left side, between the 4th and 6th ribs. Normal heart sounds are "lub-dub". Each "lub-dub" represents one contraction of the heart. The noises are made when the valves snap shut. "Lub" is the closing of the atroventricular valves; "dub" is the closing of the pulmonary and aortic valves (look 'em up in an anatomy book!)

Some people may have other heart sounds as well. If a quiet "whoosh" is heard after the "lub-dub", this is called a "murmur". Murmurs are the sounds of the blood itself moving through the heart. It makes noise when the blood flow has turbulence. This can be because a valve doesn't open or close all the way. Many people have heart murmurs without it affecting them at all.

Finding your pulse
There are different places to find your pulse. The two most common are the carotid pulse (in the neck) and radial pulse (inside of wrist). Your pulse can also be found in your temple, behind your knee and on top of your foot. Try to find each of these pulses on another person.

Determining Pulse Rate
For this activity, you are going to do a serious of activities to compare your pulse rate. Avg. adult pulse rate is 72 beats/min.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Pulse rate in 15 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lying still on a table for 5 minutes</td>
<td></td>
</tr>
<tr>
<td>Standing still</td>
<td></td>
</tr>
<tr>
<td>Holding your breath</td>
<td></td>
</tr>
<tr>
<td>Holding your arms above your head</td>
<td></td>
</tr>
</tbody>
</table>
Now you will look the effect of exercise on your pulse rate. You need to choose an exercise you will be comfortable doing for at least 2 minutes. It should be strenuous enough to raise your pulse rate. *(if you cannot participate in gym right now come see me!!!)* After exercising you will take your pulse and continue to take your pulse, each minute following for 5 minutes.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Pulse rate in 15 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediately following exercise</td>
<td></td>
</tr>
<tr>
<td>1 minute of rest</td>
<td></td>
</tr>
<tr>
<td>2 minutes of rest</td>
<td></td>
</tr>
<tr>
<td>3 minutes of rest</td>
<td></td>
</tr>
<tr>
<td>4 minutes of rest</td>
<td></td>
</tr>
<tr>
<td>5 minutes of rest</td>
<td></td>
</tr>
</tbody>
</table>

Athletes often have lower resting rates and recovery times. Recovery means how long it took your pulse to return to normal.

**Determining Blood Pressure**

Blood pressure is taken using a sphygmomanometer and a stethoscope. The cuff is place on the upper arm and the stethoscope is placed just under the lower edge of the cuff. Normal is 120/80 mmHg.

**To take blood pressure**
1. Position cuff and inflate to above 200 mmHg.
2. Place bell of stethoscope under edge of cuff.
3. Slowly deflate cuff and listen for sound to appear. At the first sound read the number on the dial, this is the *systolic number*.
4. Continue to deflate the cuff until the sounds disappear. When they do, that is the *diastolic number*.
5. Repeat until you feel comfortable with the procedure.

When you feel comfortable, do the following:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Blood pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lying down (5 minutes)</td>
<td></td>
</tr>
<tr>
<td>Sitting</td>
<td></td>
</tr>
<tr>
<td>Standing</td>
<td></td>
</tr>
<tr>
<td>Immediately after 1 min exercise</td>
<td></td>
</tr>
</tbody>
</table>
Conclusion

1. What information could a doctor determine from listening to a patient’s heart?

2. Why would you expect an increase in pulse rate while holding your breath?

3. Why does exercise increase your pulse rate?

4. Would you expect athletes to have a lower or above average pulse rate and why?

5. How long was your recovery time? What does this say about the health of your heart?

6. When you measure blood pressure, what are you measuring? (in other words, what is going on inside your body)

7. Specifically, why is it important to keep your blood pressure under control?
"Look Fors and Listen Fors" in Components of Charlotte Danielson's Framework for Professional Practice

Domain 1: Planning and Preparation

Component 1a: Demonstrating Knowledge of Content and Pedagogy
- Knowledge of content and the structure of the discipline
- Knowledge of prerequisite relationships
- Knowledge of content-related pedagogy

Look Fors and Listen Fors:
- Lessons based on current best practice
- Advanced courses in content and techniques
- Instructional artifacts (evidence in the form of student work products with comments)
- Instructional interactions with students

Component 1b: Demonstrating Knowledge of Students
- Knowledge of child and adolescent development
- Knowledge of the learning process
- Knowledge of students' skills, knowledge, and language proficiency
- Knowledge of students' interests and cultural heritage
- Knowledge of students' special needs

Look Fors and Listen Fors:
- Inventories, surveys and communications to families are used to gather information about students at the beginning of the year.
- Uses school records, i.e. test scores, permanent records, IEP's etc. as primary sources of knowledge of students. Uses secondary sources such as conversations with prior teachers and other school personnel.
- Class description that appropriately classifies students by learning abilities and other indicators (2nd language, other ethnic-cultural issues, special needs – both medical, social and educational)
Component 1c: Setting Instructional Outcomes

- Value, sequence, and alignment
- Clarity
- Balance
- Suitability for diverse learners

Look Fors and Listen Fors:

- Goals are age/level appropriate
- Goals are suitable for diverse learners
- Goals = what students will learn as opposed to lesson objectives which = what students will know, understand, and be able to do
- Goals can be assessed

Component 1d: Demonstrating Knowledge of Resources

- Resources for classroom use
- Resources to extend content knowledge and pedagogy
- Resources for students

Look Fors and Listen Fors:

- Resources to assist teaching and/or help students, i.e. texts, instructional aids, field trips, experts from community, programs/experiences, technology
- Knowledge of a range of resources, services and aids

Component 1e: Designing Coherent Instruction

- Learning activities
- Instructional materials and resources
- Instructional groups
- Lesson and unit structure

Look Fors and Listen Fors:

- In Unit Plans – at least three weeks with daily topics and activities that reflect organization and sequencing, and variety of materials and groups
- In Lesson Plans – description of students, instructional objectives, assessments, activating, cognitive, and summarizing strategies, materials, and potential misunderstandings
• Grouping patterns with a student focus:
  Low – teacher or student leads large group, students work in small groups while teacher circulates; students work alone, teacher monitors
  Moderate – teacher works w/ small groups; students work alone or in small groups
  High – student lead presentations or other leadership roles within a structured lesson

Component 1f: Designing Student Assessment
• Congruence with instructional outcomes
• Criteria and standards
• Design of formative assessments
• Use for planning

Look Fors and Listen Fors:
• Methods of assessing each goal: tests, data analysis, production of findings, collaboration
• Scoring systems/rubrics establishing measurable criteria are communicated up front
• Authentic, real world applications are evident
• Feedback to students guide next steps, i.e. teaching or re-teaching

Domain 2: The Classroom Environment

Component 2a: Creating an Environment of Respect and Rapport
• Teacher interaction with students
• Student interactions with other students

Look Fors and Listen Fors:
• Teacher establishes relationships with each student
• Teacher shows an appreciation for each child as an individual
• Teacher provides opportunities for students to get to know and accept each other
• Teacher establishes (with students) and communicates classroom procedures and rules
• Teacher encourages students to take intellectual risks and be creative
• Words and actions of the teacher demonstrate this skill
• Teacher plans for respect and rapport by creating an environment conducive to:
  FUN – creating lessons and activities that students enjoy
  FREEDOM – provide choice (cognizant of audience);
  teacher remains the Captain
  POWER – feeling of value, students matter and contribute;
  recognition of talents and skills
  BELONGING – caring/community of learners
  SURVIVAL – doing what must be done to get what you want; compelling motivation to do...

**Component 2b: Establishing a Culture for Learning**

- Importance of the content
- Expectations for learning and achievement
- Student pride in work

Look Fors and Listen Fors:

- Evidence must be in the classroom -- the look of the room, student work displayed (scored or rated with written feedback); nature of the interactions and tone of conversations with and among students reflect they are interested in and value learning and hard work.

**Component 2c: Managing classroom Procedures**

- Management of instructional groups
- Management of transitions
- Management of materials and supplies
- Performance of noninstructional duties
- Supervision of volunteers and paraprofessionals

Look Fors and Listen Fors:

- Evidence in the classroom -- teacher explains, re-teaches
and implements procedures
- Procedures are posted in the classroom, communicated in writing to students and families early in the year (normally, the first day of school is used to communicate procedures).
- If working in co-teaching or collaborative models, each person is appropriately utilized with ease of transition from person to person

**Component 2d: Managing Student Behavior**
- Expectations
- Monitoring of student behavior
- Response to student misbehavior

**Look Fors and Listen Fors:**
- Age appropriate and culturally consistent standards
- Rules are made clear to all and are posted in the classroom
- Rules are clearly and consistently applied (no favoritism is evident)
- "Withitness" is apparent in that the teacher is always aware or what is going on and uses this awareness to influence student behavior through redirection and proximity
- Teacher does not lose temper or composure; students do not fear verbal or physical attack
- Chastisement focuses on behavior, not student as a person
- Classroom rhythm is only minimally disrupted; student dignity is maintained
- Teacher encourages students to monitor their own behavior
- Student behavior reflects what teachers has done to establish and maintain standards
- Preventive and intervening strategies are appropriately applied

**Component 2e: Organizing Physical Space**
- Safety and accessibility
- Arrangement of furniture and use of physical resources

**Look Fors and Listen Fors:**
- Spaces for reading, quiet and noisy activities are provided
- Furniture arrangement is appropriate for large and small
group activities
- Centers for exploration of content in the form of labs, circles, etc.
- Safety is evident; no bags, trash, clothing, etc.; aisles between desks, tables, etc. provide good traffic flow; school-wide procedures for emergency exiting or lockdown are provided.
- Materials are accessible; teaching aids, boards, charts, projectors/computers are skillfully positioned and utilized
- Transparencies/TV, board work, posters, etc. are neat and clear for reading; high quality power points and videos are evident and content appropriate.
- Appropriate use of technology is evident
- Students are involved in supporting an organized, safe classroom through assisting with transitions, equipment, materials and supplies

Domain 3: Instruction
Component 3a: Communicating with Students
- Expectations for learning
- Directions and procedures
- Explanations of content
- Use of oral and written language

Look For and Listen For:
- Clear directions and explanations (oral and written)
- Vivid, expressive language is used to enhance student experience
- Clear limits are set, including time factors
- Language is audible, legible; correct usage, spelling, etc. is apparent
- Teacher carefully chooses words, using rich vocabulary for
students to model

Component 3b: Using Questioning and Discussion Techniques
- Quality of questions
- Discussion techniques
- Student participation

Look Fors and Listen Fors:
- Essential question is posted for each lesson; question is asked by teacher and answered by students throughout the lesson
- Questions engage students in an exploration of content, are not rapid fire, low level, recitation of facts
- “Think time” is allowed before responses
- Teacher probes to seek clarification, i.e. “explain…”, “give an explanation for…”
- All students are engaged in discussion; not just a few, students often take initiative
- Teacher stays on topic, uses follow-up, rephrases and applies what students contribute or pose

Component 3c: Engaging Students in Learning
- Activities and assignments
- Grouping of students
- Instructional materials and resources
- Structure and pacing

Look Fors and Listen Fors:
- Instructional artifacts – student work, out of class assignments
- Teachers uses of examples and metaphors that illustrate new learning; teacher connects with student knowledge, interests and culture
- Teacher promotes problem-solving; permits choice, encourages depth-find patterns, tests hypotheses, requires thought; is relevant and authentic
- Groupings are based on instructional goals
- Materials and resources are ready for student use with little or no disruption
- Structure of lesson is maintained; pacing is appropriate with a beginning, a middle, and end (closure)

Component 3d: Using Assessment in Instruction
- Assessment criteria
- Monitoring of student learning
- Feedback to students
- Student self-assessment and monitoring of progress

Look For and Listen For:
- Teacher and peer comments on student work
- Teacher uses body language such as nods, quizzical looks, etc. to encourage students
- Effective feedback that is specific, descriptive, understandable; Feedback is not praise ("good work" or "good job"); grades, encouragement ("Keep it up" or "You can do it") or criticism ("Unacceptable... You get a zero")
- Comments give students information needed to adjust what they are doing and get better at it or solve a problem; it provides time to think and reflect; performance is related to standards
- All feedback is provided in a timely fashion, "on the spot", or on work products, as needed to support learning

Component 3e: Demonstrating Flexibility and Responsiveness
- Lesson adjustment
- Response to students
- Persistence

Look For and Listen For:
- Adjustments that improve student experience or clarify confusion
- Change provides for needs specific learners (visual, auditory, slower, brighter, etc.)
- Teacher abandons lesson all together or coordinates with a spontaneous event
- Teacher possesses an extensive repertoire of strategies such that transitions are seamless; students may not be aware that a change has occurred
Domain 4: Professional Responsibilities

Component 4a: Reflecting on Teaching

- Accuracy
- Use in future teaching

Look Fors and Listen Fors:

- Examine reflection notations and logs
- Conduct professional reflective conversations during post observation conferences, i.e. “Tell me how you felt about the lesson.”, “What were you observing during your teaching?”,”Can you tell me what was different about yesterday’s lesson?”
- Model the practice that recognizes how we can all improve

Component 4b: Maintaining Accurate Records

- Student completion of assignments
- Student progress in learning
- Noninstructional records

Look Fors and Listen Fors:

- Examine organization and management of the portfolio, grade book or database
- Look at how paperwork is maintained, i.e. worksheets,
tests, records of “homeroom” tasks, permission slips, lunch, classroom inventories and reports.

Component 4c: Communicating with Families
- Information about the instructional program
- Information about individual students
- Engagement of families in the instructional program

Look Fors and Listen Fors:
- Family contact logs with consistent phone calls, emails, letters home, etc. to all students when appropriated and to specific students, as needed
- Use of bulk contact formats such as class newsletter; postcards
- Conference records
- Notations in student agendas
- Parental responses to students inventories

Component 4d: Participating in a Professional Community
- Relationships with colleagues
- Involvement in a culture of professional inquiry
- Service to the school
- Participation in school and district projects

Look Fors and Listen Fors:
- Evidence of support and cooperation, volunteering for school committees and extra-curricular responsibilities
- Chairing committees, teams, etc. or coordinating programs
- Movement beyond one’s own classroom

Component 4e: Growing and Developing Professionally
- Enhancement of content knowledge and pedagogical skill
- Receptivity to feedback from colleagues
- Service to the profession

Look Fors and Listen Fors:
- The teacher voluntarily examines and shares research on class performance and best practice strategies
- Takes leadership roles; coordinators study groups, professional book clubs
• Subscribes to professional/trade journals
• Attends professional conferences and shares with colleagues upon return

Component 4f: Showing Professionalism
• Integrity and ethical conduct
• Service to students
• Advocacy
• Decision making
• Compliance with school and district regulations

Look Fors and Listen Fors:
• Daily interactions with students
• Helpfulness for needy students
• Advocates for underserved students
• Is open-minded and willing to adopt new approaches
• Uses data to support actions
• Sets long-term goals and takes responsibility for own professional growth
• Demonstrates high ethical standards through compliance with school/district codes and community expectations
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