

# Technical Mentoring – Preparing the Next Generation

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Environment Testing  
America

Time (and tide)  
wait for no man

- *Geoffrey Chaucer*



## Why and What

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- Lifelong careers in environmental monitoring
- How do we prepare the next generation?
  - For their future
  - Not our past
- “Relationship” skills

Test Training

Task Training

Coaching

Mentoring



# Test Specific Training

- How to do test “X” with instrument “Y” following SOP “Z”

- Senior analyst to new analyst
- Dedicated trainer
- Training video

METHOD 8270E	
<u>SEMIVOLATILE ORGANIC COMPOUNDS BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY</u>	
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METHOD 6020B																							
<u>INDUCTIVELY COUPLED PLASMA—MASS SPECTROMETRY</u>																							
SW-846 is not intended to be an analytical training manual. Therefore, method procedures are written based on the assumption that they will be performed by analysts who are formally trained in at least the basic principles of chemical analysis and in the use of the subject technology.																							
In addition, SW-846 methods, with the exception of required method use for the analysis of method-defined parameters, are intended to be guidance methods which contain general information on how to perform an analytical procedure or technique which a laboratory can use as a basic starting point for generating its own detailed standard operating procedure (SOP), either for its own general use or for a specific project application. The performance data included in this method are for guidance purposes only, and are not intended to be and must not be used as absolute quality control (QC) acceptance criteria for purposes of laboratory accreditation.																							
1.0 SCOPE AND APPLICATION																							
1.1 Inductively coupled plasma-mass spectrometry (ICP-MS) is applicable to the determination of sub-µg/L concentrations of a large number of elements in water samples and in waste extracts or digests (Refs. 1 and 2). When dissolved constituents are required, samples must be filtered and acid-preserved prior to analysis. No digestion is required prior to analysis for dissolved elements in water samples. Acid digestion prior to filtration and analysis is required for groundwater, aqueous samples, industrial wastes, soils, sludges, sediments, and other solid wastes for which total (acid-leachable) elements are required. The analyst should insure that a sample digestion method is chosen that is appropriate for each analyte and the intended use of the data. Refer to Chapter Three for the appropriate digestion procedures.																							
1.2 ICP-MS has been applied to the determination of over 60 elements in various matrices. Analytes for which the acceptability of Method 6020 has been demonstrated through multi-laboratory testing on solid and aqueous wastes are listed below.																							
<table><tr><th>Element</th><th>Symbol</th><th>CASRN<sup>a</sup></th><th>Element</th><th>Symbol</th><th>CASRN<sup>a</sup></th></tr><tr><td>Aluminum</td><td>Al</td><td>7429-90-5</td><td>Magnesium</td><td>Mg</td><td>7439-95-4</td></tr><tr><td>Antimony</td><td>Sb</td><td>7440-36-0</td><td>Manganese</td><td>Mn</td><td>7439-96-5</td></tr></table>						Element	Symbol	CASRN <sup>a</sup>	Element	Symbol	CASRN <sup>a</sup>	Aluminum	Al	7429-90-5	Magnesium	Mg	7439-95-4	Antimony	Sb	7440-36-0	Manganese	Mn	7439-96-5
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# Task Specific Training

- How to do support tasks outside of the specific sample preparation and analysis steps needed to analyze the samples.



- Unpack sample coolers
- Check test specific backlog in LIMS
- Report results to client
- Manage waste streams



# Coaching

- Functional needs
- Looking beyond the current narrowly defined tasks

- Client data complaint
- Broken lab process (QC criteria)
- New analyte request
- New instrument opportunity
- Improve test quality
- Improve test productivity



# Mentoring

- Relational needs
  - Build a framework for future growth
  - Leadership development
  - Retain staff with nonmonetary benefits
  - Mentor becomes less essential
- Subject matter expert
  - Improve communication skills
  - Damage control
  - More effective trainer
  - Grow emotional intelligence
  - Identify “at risk” tests
  - Adapt one’s expression of personality to different circumstances

# Coaching examples

- Client complaint about unwanted test result
  - Must be lab error
- At the lab
  - Avoid defensiveness
  - Diffuse frustration



- Listen, Ask questions, Listen more
- Understand the issue
  - What sample ID, method & analyte?
  - More sample available for rework?
  - How does the result affect the client?
- Resolve the issue
  - Check calculations, dilutions, interferences, degradation
  - Alternate confirmation methods



# Coaching examples

- Broken lab process
- Method?
- Analyte(s)?
- What are the quality indicators?

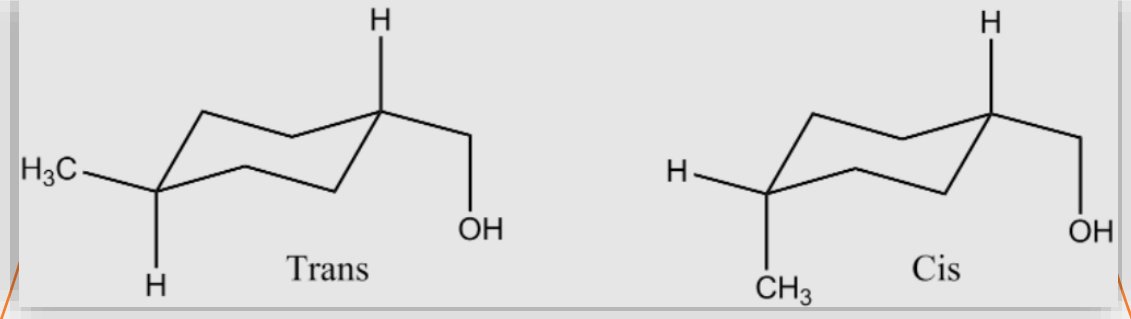
- Examine control charts
- Dissect the process into parts
- Find problem step
- List potential causes & test them



# Coaching examples

- New analyte request
- Analyte(s)
- Existing methods (nemi.gov)
  - SW-846
  - Water compendium
  - Drinking water
  - Standard methods
  - ASTM

- Structure
- Chemical properties
- Add to existing method?
- Modify method?
- Develop new method?



## Coaching examples

- New instrument purchase
- Direct replacement with current model
- Evaluate new model
- Evaluate alternate manufacturers

- What is used by other labs in network?
- List of manufacturers and models?
- Sensitivity
- Return on investment



## Coaching examples

- Quality improvement
- Emerging expectations
  - Lower reporting limit
  - Tighter recovery limit
  - Tighter precision limit
  - Reducing false positives

- Instrument capabilities
- Sample preparation adjustments
- New instrument options
- Alternate technique options





# Coaching examples

- Productivity improvement
- Capacity increase
- Cycle time reduction

- Examples from labs already meeting the goal
- New instrumentation
- Return on investment

# Mentoring examples

- Subject matter expert
- Why?
  - Acknowledged expert
  - Curious
  - Excel
  - Contribution

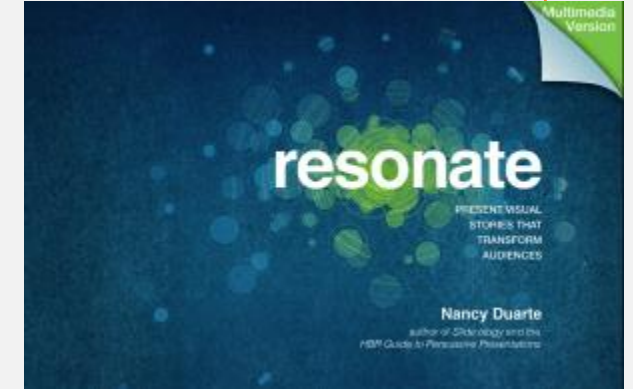
- Previous experience
- Interests
- Study opportunities
- Hands on opportunities
- Need



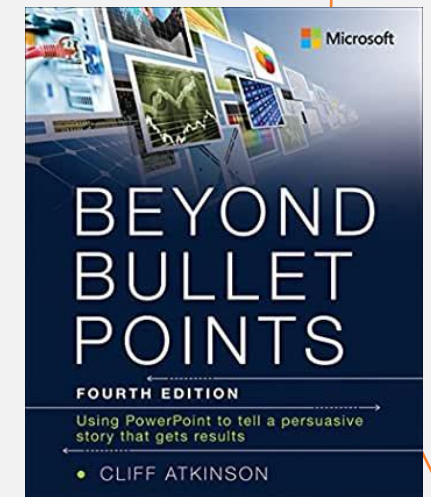
# Mentoring examples

- Professional presentations
- Conferences
- Laboratory clients
- Internal education

- Slideument
- Visual supplement
- Resonate  
– Nancy Duarte



- Beyond Bullet Points  
– Cliff Atkinson

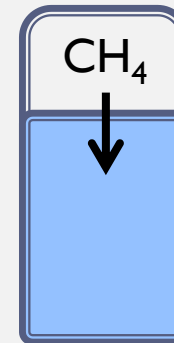


# Mentoring examples

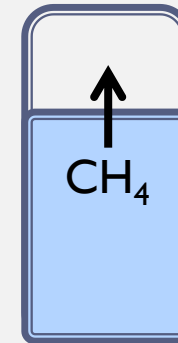
- “At Risk” tests
- Productivity
- Quality

- Process differences for QC samples and field samples
- Example
  - Dissolved gas analysis in water

Standards & QC



Samples





# Mentoring examples

- Communication skills

- Written
- Spoken
- Video
- In-person

- 50-90% is nonverbal

- Voice tone
- Facial expression
- Body language

- Brain fills in the gaps

- Blind spot in eye
- What is available?
- Our own emotions and intentions

- How to Have That Difficult Conversation

- Cloud & Townsend

- The 5 Languages of Appreciation in the Workplace

- Chapman & White

- The Five Languages of Apology

- Chapman & Thomas

# Mentoring examples

- Damage control
  - lab mistake
- Client discovery
- Lab discovery
- Chief Apology Officer

- Effect on the data
- Root cause
- Impact on client
- Corrective action
- Data recall
- Reanalysis
- Resampling
- Financial implications

# Mentoring examples

- Emotional intelligence

- self-awareness
- self-regulation
- social (other) awareness
- relationship management

- Daniel Goleman
- Brené Brown
- Permission to Feel
  - Mark Bracket
- Emotional Agility
  - Susan David
- Leadership Beyond Reason
  - John Townsend

# Mentoring examples

- Adapt expression without core value compromise
- Values clarification
- Living into Our Values

- Dare to Lead
  - Brené Brown
- At Your Best
  - Carey Nieuwhof
- Personality types
  - Strengths Finder
  - Myers-Briggs
  - Enneagram



# **Learning and Growing**

- Train for immediate tasks
- Coaching for problem solving
- Mentoring for growth

**Test Training**

**Task Training**

**Coaching**

**Mentoring**

# Coaching

- Functional Needs
- Foundation for problem solving

- Define the root issue
- List potential solutions
- Evaluate
- Select
- Implement
- Maintain

# Mentoring

- Relational Needs
- Foundation for growth
- Moving from task to relationship focus
- Durable “why”

- Communication
- Personality
- Emotional Intelligence

# Contact Information

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