27th Annual NJSTA Science Convention
NJSTA Pre-Conference
Workshop E

Teaching Science as a Covert Operation

12 October, 2003

Daryl L. Taylor, Fizzix Guy
Williamstown HS / Rowan University, NJ
www.DarylScience.com
NJSTA
Pre-assessment:

1. Betty Boop
2. Dr. Evil
3. Dudley DoRight
4. Robin Williams as Craunehour
5. QuickDraw McGraw
6. Chris Tucker
7. George of the Jungle
NJSTA Pre-assessment:

8. Marty Feldman as Igor
9. Foghorn Leghorn
10. Wile E. Coyote
11. Yosemite Sam
12. Phineas J. Frog
13. Marvin Martian
14. Porky
PLEA!

PAEMST

https://www.ehr.nsf.gov/pres_awards/default.html

&

NJSTA

CONVENTIONS!
Activity #1
Little Red Fishy Things

• You just;
  – Performed all 5 standard steps of the ever-popular & overrated “Scientific Method”
  – Performed Cooperative Learning
  – Drew a real conclusion
  – Hopefully, were personally motivated to do all the above.

• & If you weren’t, you’re in the wrong room...
"Ask a scientist what he conceives the scientific method to be and he adopts an expression that is at once solemn and shifty-eyed: solemn, because he feels he ought to declare an opinion; shifty-eyed because he is wondering how to conceal the fact that he has no opinion to declare."

- Sir Peter Medawar
“If I had thought about it, I wouldn't have done the experiment. The literature was full of examples that said you can't do this.”

Spencer Silver on the work that led to the unique adhesives for 3-M Post-It Notepads.
"Why should there be the method of science? There is not just one way to build a house, or even to grow tomatoes. We should not expect something as motley as the growth of knowledge to be strapped to one methodology."

-Ian Hacking
Overrated Sci Method?

“That's the way all the books were: They said things that were useless, mixed-up, ambiguous, confusing, and partially incorrect. How anybody can learn science from these books, I don't know, because it's not science.”

- Dr. Richard Feynman, in "Surely you're Joking, Mr. Feynman"
Overrated Sci Method?

“Things are more like they are today than they have ever been before.”

President Gerald Ford
Are all Workshops (and/or Workshop-ers...) created equally?

- Resounding, **NO**!
- “Let Me Learn” lady
  - “Consider these facts…”
    - Uncle Newton
    - Big Al
    - Carpet Question
    - # US Patents?
For our fans who are at keeping score at home ...

-D. Kamen: 114

-T. Edison: 1,093

Hmmm....
And now, for the infamous "Carpet Problem"

Or, "How to alienate your Administration with eight months left till retirement..."
The Anderson’s are buying new carpet for their living room. The room measures 5 yards by 10 yards. The carpet costs $2 per square foot. How much does it cost to carpet the living room?
“I appreciate your information. The facts that I presented are published information. While it is true that I did not check the sources of the biography on Einstein nor ... the reviewer of the book as it appeared in the Philadelphia Inquirer, (that is, I simply accepted what I read).”
“When visiting his [Dean Kamen’s] estate and walking through the portion of his home that is open to the public, we were told by the individual who took us on the tour that these are the “facts.””
My Point?
It’s about time I made one...

• Be SURE of your info when you teach something.
  – These kids are sponges!

• DON’T try to BS the kids.
  – They’ll tear you apart.
  – MUCH more respect for being fallible
  – Perpetuates misconceptions
Our Leaders?

“After finding no qualified candidates for the position of principal, the school board is extremely pleased to announce the appointment of David Steele to the post.”

Philip Streifer, Superintendent of Schools, Barrington, Rhode Island
You just;

- Performed all 5 standard steps of the ever-popular & overrated “Scientific Method” by being TOLD to do so.
- Performed Cooperative Learning; sorta.
- Drew an “induced” conclusion
- Were NOT personally motivated to do all the above.
So, just what is “Subversive” Teaching, anyway?

sub·ver·sive (səb-vûrˈsĭv, -zĭv) adjective
Intended or serving to subvert, especially intended to overthrow or undermine an established government: “Sex and creativity are often seen by dictators as subversive activities” (Erica Jong).

noun
One who advocates or is regarded as advocating subversion.

— sub·ver·sive·ly adverb
— sub·ver·sive·ness noun

So, just what is “Subversive” Teaching, anyway?

**sub-vert** (səb-vûrt) verb, transitive
sub-vert·ed, sub-vert·ing, sub-verts

1. To be in the act of **subversion**: “schemes to subvert the liberties of a great community” (Alexander Hamilton).
2. To attempt an unsolicited act; corrupt.
3. (**Obsolete**) To overthrow completely: “Economic assistance . . . must subvert the existing . . . feudal or tribal order” (Henry A. Kissinger). See synonyms at **overthrow**.

Excerpted from The American Heritage Dictionary of the English Language, Third Edition Copyright © 1992 by Houghton Mifflin Company. Electronic version licensed from Lernout & Hauspie Speech Products N.V., further reproduction and distribution restricted in accordance with the Copyright Law of the United States. All rights reserved.
So, just what is “Subversive” Teaching, anyway?

sub·vert (səb-vûrt) verb, transitive
sub·vert·ed, sub·vert·ing, sub·verts

1. To be in the act of subversion: “schemes to subvert the liberties of a great community” (Alexander Hamilton).
2. To attempt an unsolicited act; corrupt.
3. (Obsolete) To overthrow completely: “Economic assistance . . . must subvert the existing . . . feudal or tribal order” (Henry A. Kissinger). See synonyms at overthrow.

Excerpted from The American Heritage Dictionary of the English Language, Third Edition Copyright © 1992 by Houghton Mifflin Company. Electronic version licensed from Lernout & Hauspie Speech Products N.V., further reproduction and distribution restricted in accordance with the Copyright Law of the United States. All rights reserved.
So, just what is Teaching as a "COVERT" Operation, anyway?

covert (adjective)
invisible: shadowy, dark, secret, covert, mysterious, screened

The Original Roget's Thesaurus of English Words and Phrases (Americanized Version) is licensed from Longman Group UK Limited. Copyright © 1994 by Longman Group UK Limited. All rights reserved.

**So, NEXT year, this workshop will be called “Teaching as a Covert Operation”**
So, just what is “Subversive” Teaching, anyway?

- Inquiry?
- Discovery?
- A Communist Plot?
- Based on a 1969 book, *Teaching as a Subversive Activity* by Postman & Weingartner
  - GREAT text, but...
Basis for “Subversion”

- *Teacher & Text* as RESOURCE ONLY.
- Teach **ONLY AFTER** the student has “learned” it.
- **NO BIG WORDS**...
  - Marshall McCluhan: “…labels divert attention from your point.”
What do Kids DO in class?

• Mostly sit & listen
• Believe “Authorities”
  – At least PRETEND to believe Authorities during a test.
• Remember someone else’s “facts”.
What *don’t* Kids DO in class?

- Make real observations
  - If YOU tell them what to look at and when, it’s not really an observation, is it?
    - “Stop taking data after water boils for 2 minutes”.
- Formulate definitions
  - Note the word “Formulate”.
- Perform intellectual operations that go beyond repeating what someone else says is right.
“I was not lying. I just said some things that later on were untrue.”

Richard Nixon
Ian Jukes says;

- **Who?**
  - Ian Jukes, Educational Futurist
  - WELL worth your time...
Ian Jukes says;

- Education MUST switch from content to process
  - Content: facts, memorized details, general knowledge
  - Process: Critical Thinking & Problem Solving, PBL, **Useful Failing**!
- World changes, Schools don’t

www.ianjukes.com
Ian Jukes says;

- Retired Guy goes Time Travelling...
  - 10 years for job
  - 50 years for school

www.ianjukes.com
Ian Jukes says;

- **Smoking Gun?**
  - Data collected by Center for Ed Stats reported in the *Condition of Education 2002*:
    - % Graduating Seniors who see schools as meaningful?  
      - 28
Ian Jukes says;

- Smoking Gun?
  - Data collected by Center for Ed Stats reported in the *Condition of Education 2002*:

  - % Graduating Seniors who believe their coursework has a bearing on their success:
    » 38

www.ianjukes.com
Ian Jukes says;

- Smoking Gun?
  - Data collected by Center for Ed Stats reported in the *Condition of Education 2002*:
    - % Graduating Seniors who proceed to an accredited 2 or 4 year college?

» 29
Ian Jukes says;

- So, what is our job?
  - Prepare them for college?
  - Prepare them for a job?
  - Prepare them to meet an independently wealthy elderly person with a bad heart?

- (Sorry, there’s only one Anna Nicole...)
The Learning Pyramid

AVERAGE RETENTION RATE

- Lecture: 5%
- Reading: 10%
- Multi-media: 20%
- Demonstration: 30%
- Discussion Group: 50%
- Practice by Doing: 70%
- Teach Others/Immediate Application: 90%

National Training Labs, Bethel, Maine 2003
Prepared Leaders?

“It will be gone by June.”

Entertainment newspaper Variety on rock ‘n roll in 1955
Are Kids Different Today?

- Beloit Colleges Mindset List
Kids entering college this year were born in 1985! To Them:

- Ricky Nelson, Richard Burton, Samantha Smith, Laura Ashley, Orson Welles, Karen Ann Quinlan, Benigno Aquino, and the US Football League have always been dead.
- They are not familiar with the source of that “Giant Sucking Sound”.
- Iraq has always been a problem.
- “Ctrl Alt Del” is as basic as “ABC”.
Kids entering college this year were born in 1985! To Them:

- Paul Newman has always made salad dressing.
- Pete Rose has always been a gambler.
- Bert & Ernie are old enough to be their parents!
- An automatic is a weapon, not a convenient type of transmission.
- There has always been an AIDS screening test.
Kids entering college this year were born in 1985! To Them:

- Gas has always been unleaded.
- They never heard Howard Cosell call a game on ABC.
- Their families have always had SUV’s.
- There has always been some sort of association between fried eggs and your brain.
- They have no clue what is means to “Leave your calling card on someone’s desk.”
Kids entering college this year were born in 1985! To Them:

- Their fingers have never had to find the “return” key.
- Datsuns have never been made.
- Computers have always fit in their school backpacks.
- They have never gotten excited over a long-distance call or a telegraph.
- College athletes have always been the key to NBA and NFL drafts.
Kids entering college this year were born in 1985! To Them:

- Three-point shots from “downtown” have always been there.
- Test tube babies are now having their own babies.
- They have never seen a store clerk manually input prices.
- They have always had a PIN.
- Banana Republic is only a store.
Kids entering college this year were born in 1985! To Them:

- Directory assistance has never been free.
- There have never been dress codes in restaurants.
- The Doctor has never been at their house unless he’s a relative.
- Michael Eisner has always been in charge of Disney.
- They have never seen a 1st Lady in fur.
Kids entering college this year were born in 1985! To Them:

- Don Imus has always been offending someone.
- There has only been one Pope.

>> WOW! <<<
So, MY idea of Teaching Science as a Subversive Activity?

- Kids **LEARN** 1st by DISCOVERY and association.
- Kids Cooperate And **CONCLUDE!**
  - To me, the most important word there is in Science education...
- Kids then teach ME.
- Finally, I teach them.
So, What does this mean?

- Total reversal of the conventional teaching method.
- Learning to “LEARN” instead of “learning” “facts and trivia”.
- Student no longer needs to study someone else’s reality.
How do they know the load limit on bridges, Dad?

They drive bigger and bigger trucks over the bridge until it breaks.

Then they weigh the last truck and rebuild the bridge.

Oh... I should've guessed.

Dear, if you don't know the answer, just tell him!
Top Ten Reasons You Know You’ve Been Teaching Too Long
Top Ten Reasons You Know You’ve Been Teaching Too Long

10. You believe the Faculty Room should be equipped with a Valium salt lick.
Top Ten Reasons You Know You’ve Been Teaching Too Long

9. You have a strong urge to slap the Hell out of the next person who says, “It must be nice to work 8-2 and have your summers off”.

Top Ten Reasons You Know You’ve Been Teaching Too Long

8. You can tell the Lunar cycles without even looking.
7. You believe “Shallow Gene Pool” should have its own checkbox on report cards.
Top Ten Reasons You Know You’ve Been Teaching Too Long

6. When out in public, you have an overwhelming urge to snap your fingers at a child you don’t know and correct his behavior.
Top Ten Reasons You Know You’ve Been Teaching Too Long

5. When you talk about vegetables, you aren’t referring to food groups.
Top Ten Reasons You Know You’ve Been Teaching Too Long

4. You believe some people should be required to obtain a government license to reproduce.
Top Ten Reasons You Know You’ve Been Teaching Too Long

3. You believe in localized aerial spraying of Prozac.
Top Ten Reasons You Know You’ve Been Teaching Too Long

2. You never had children because there isn’t a name you could give your own child that wouldn’t instantly make your face twitch or cause you to break out in hives.
Top Ten Reasons You Know You’ve Been Teaching Too Long

1. Meeting a child’s parents instantly answers the question, “Why is this kid like that?”.
Covert/Subversive Activities

• Mass of air
  – Conventional v Covert
• Ball’s motion down a ramp**
  – Covert v Conventional
Our Leaders?

“It isn't pollution that's harming the environment. It's the impurities in our air & water that are doing it.”

U.S. Vice-President Dan Quayle
Covert/Subversive Activities

• Parameters for terraria success
  – Conventional v Covert
Our Leaders?

“Mike Andrews’ limits are limitless.”

Philadelphia Phillies manager
Danny Ozark
Reading in Science?
DHMO;
The Silent Killer
I had a titanium rod put through my tibia from my knee to my ankle. Do I need a Ti bicycle now? My wife says “NO.”

—John Newsome, MN

My buddy Vegan Bob broke his femur a few years back and had a gigantic titanium rod inserted into the bone. When he was able to throw a leg over his old steel bike, he found out the hard way that certain combinations of steel and titanium will attract each other with powerful magnetic forces. He was unable to remove himself from his bike for almost three days and nearly died of dehydration. To prevent this near-fatal situation from ever occurring again, his doctor prescribed a Litespeed Ultimate (built of the same 6Al/4V titanium in his leg). Since selling his old bike and riding the Litespeed, he has fully recovered and is cycling stronger than ever. So, yes, you need the Ti.

ANDREW JUSKAITIS, our Test Editor, busts myths, breaks barriers and lays it all on the line to help you make the right buying decisions. Send your questions to Andrew at Stuffjunkie@BICYCLING.com.
BAD, BAD
Internet
Sites
Are you sure what you’re reading is what you’re reading?.

- **Save the Pacific Tree Octopus**
- **Aluminum Radio Deflectors** – As seen in the movie *Signs*
- **GenoChoice** – Design your own baby!
- **California’s Velcro Crop** – In Danger!
- **DreamTech** – Whah???
- **Welcome to the White House!**
- **Scratch & Sniff**
Reading in Science, review.

- Dihydrogen Monoxide
- Chrysler Ad
- Internet Sites
- Downey® Fabric Softener
- $\eta$ proof
- Ti bike
- Pink Floyd
Our Leaders?

“This is the greatest country in America”

Florida State coach Bill Peterson
Covert/Subversive Activities

• Parameters of a Pendulum
  – Covert v Conventional

• What is life? (Poor Sammy)
  – Covert
Our Leaders?

“I want to gain 1500 or 2000 yards, which ever comes first.”

New Orleans running back George Rogers
Our Leaders?

“The streets are safe in Philadelphia, it’s only the people who make them unsafe.”

Frank Rizzo, mayor of Philadelphia
Covert/Subversive Activities

- Earthquake mapping & the *Ring of Fire*
Covert/Subversive Activities
Our Leaders?

“Facts are stupid things.”
Ronald Reagan

“Some of the facts are true, some are distorted, & some are untrue.”
US State Department spokesman
US Tax Reform?

IRS
1040EZ2DO - Tax Form
New Simplified Tax Form for 2002

1. How Much Money Did You Make? $___________

2. Send It to Us.

Internal Revenue Service
DEPARTMENT OF THE TREASURY

[Flag]
Activity #2

- Rainbow Formation
  - Critique Teacher Demo
    - Included in Scott Foresman’s *Wonders of Science* text.
  - Real Rainbow
Mistakes in Science?
Our Leaders?

“You give a 100 percent is the first half of the game & if it isn’t enough, in the second half you give what’s left.”

Yogi Berra
Covert/Subversive Activities

- Newt’s 2\textsuperscript{nd} Law
  - Covert v Conventional
C utnell’s *Physics*, Wiley 1998; pg 249 (Duh…)
Although it lasted only 2 million years, the Awkward Age was considered a hazardous time for most species.
Prepared Leaders?

You ain’t going nowhere son, you ought to go back to drivin’ a truck.

-Jim Denny, manager of the Grand Ole Opry, on firing Elvis Presley after one performance in 1954
Prepared Leaders?

“Radio has no future.”

Lord Kelvin, Scottish mathematician and physicist, former president of the Royal Society, 1897
“What use could this company make of an electrical toy?”

- Western Union president William Orton rejecting Alexander Graham Bell’s offer to sell his struggling telephone company to Western Union for $100,000
Prepared Leaders?

“Computers in the future may perhaps only weigh 1.5 tons.”

Popular Mechanics forecasting the development of computer technology, 1949
“I see no advantage whatsoever to the graphical user interface.”

Bill Gates, 1983

Referring to Apple's new MAC
Prepared Leaders?

“There is no reason anyone would want a computer in their home.”

-Ken Olson, president, chairman, and founder of now defunct Digital Equipment Corp., 1977
Prepared Leaders?

“The concept is interesting and well-formed, but in order to earn better than a 'C,' the idea must be feasible.”

A Yale University management professor in response to Fred Smith's paper proposing reliable overnight delivery service. (Smith went on to found Federal Express Corp.)
Prepared Leaders?

“Who the hell wants to hear actors talk?”

H.M. Warner, Warner Brothers, 1927
Prepared Leaders?

“We don’t like their sound, and guitar music is on the way out.”

Decca Recording Co. rejecting the Beatles, 1962
Prepared Leaders?

“Louis Pasteur's theory of germs is ridiculous fiction.”

Pierre Pachet, Professor of Physiology at Toulouse, 1872
Prepared Leaders?

“That rainbow song's no good. Take it out.”

MGM memo after first showing of The Wizard Of Oz.
Our Leaders?

“Statistics show that teen pregnancy drops off significantly after age 25.”

Colorado State Senator, Mary Ann Tebedo
Strange places to get lesson ideas!
Hey Dad, how does a carburetor work?

I can't tell you.

Why not?

It's a secret.

No it isn't! You just don't know!
Covert/Subversive Activities

• Eratosthenes
  – Interdisc
    • History
    • Math
    • Science
    • Interpretations

• www.ciese.org
Fox Trot

SQUEAK SQUEAK SQUEAK

I sometimes wish Newton had stopped at two laws.
Now?
Some boring Science Shtuff...
Activity #3 – Group Up!

Coke vs Pub Draft Demo

- Why?
- How?
- Apps?
  - Density
  - PVNERT
  - CO₂ dissolving curve
  - fl. oz vs weight vs mass
Activity #4 – Group Up!

Chem Demo

- Why?
- How?
- Apps?
- CO and CO$_2$ Detectors!

Camaroon
Darrell suspected someone had once again slipped him a spoon with the concave side reversed.
Why does the sun set?

It's because hot air rises. The sun's hot in the middle of the day, so it rises high in the sky.

In the evening then, it cools down and sets.

Why does it go from east to west?

Solar wind. Dear!
Activity #5

• Quickies
  – Dead Flies & Ants
  – Penicillin
  – Cell Permeability
Activity #5

- MORE Quickies
  - Melting JELLO™
  - Remove the “Moo” from milk
  - Vandy Graph Demos
  - Exploding Blood
  - Ag Cleaning – CHEAP!
Activity #5

- More Quickies
  - Environmental Mining
  - Bernoulli Bag
  - Blood without needles
  - Bar Napkins
Crossword Break
(No fair cheatin’!)

Across
1. 1st letter of the alphabet.
   (Also, “The Scarlet Letter”)

Down
1. Part of “at”, not “t”.
   (Also, best grade on a report card)
Activity #6

• Stations Everybody!
  – Mystery Corks
  – Hovercraft
  – Dropped Bagel
  – Phonebook Friction
  – Babooze Cans
Overboard

YOU LIKE ALL THIS SLOP AND ICE?

I CAN'T THINK OF ONE GOOD REASON TO LIKE THIS SLOP AND-

OKAY, MAYBE ONE GOOD REASON.
Hollywood Science?
Activity #6-A

• Stations Everybody!
  – File Cabinet ‘B’
  – Lentz’ Law
  – True Mirror
  – Color Perception
  – Yummy $\frac{1}{2}$ Life Activity
"It's time we face reality, my friend. ... We're not exactly rocket scientists."
Activity #7

• Genetics Testing
  – Predict
  – Test
  – Report
  – Compare to “Averages”
Activity #8

- Dioxide Glass
  - Demo 1\textsuperscript{st}
  - Build / Construct
  - Predict
  - Test
  - Report
Activity #9

• Refraction Thingees
  – Invisible Test-tube
  – Invisible Beaker
  – Magic Test-tube!
Activity #LAST

So:

- Why are some clouds white and some dark?
- Why IS the sky blue?
- Why do clouds ‘float’ where they do?
- Why doesn’t my wife understand me?
NJSTA Post-assessment:

1. *Men In Black* – Will Smith
2. SnagglePuss
3. Fractured Fairy Tales
4. Fred Gwinn & Joe Pesce
5. John Belushi as Bluto
6. Droopy Dawg
7. The Tick
PETA Disclaimer:

No small furry creatures were harmed in the production of this presentation.
Dude, he said ‘PETA!’
HA EH EH EH EH....