

Discussion with the

***Templeton***

***International Fellows***

May 17, 2008

**Dr. Clar M. Baldus**  
**Program Administrator,**  
**Inventiveness, Visual Arts and Rural**  
**Schools Programs**  
**Belin-Blank Center, The University of**  
**Iowa**

**Creative Introductions using one of my  
favorite “accidental” toys...**

# Play-Doh

**Play-Doh** was originally designed as a **wallpaper cleaner**.



Invented by Noah and Joseph McVicker and marketed as a non-toxic reusable modeling compound because its similarity to regular modeling clay (without the toxicity or mess) made Play-Doh a great toy.

**Background:**

# **An Introduction to What Influences My Work**



**Iowa farm kid**

**Had five siblings & 80 1<sup>st</sup> - cousins**

**But also enjoyed the company of 2 imaginary friends**

**Artist at a young age-- but was more interested in the process of “how I could draw...”**

**Spent lots of time tinkering**

**Never liked to be fenced in—a gate climber, felt the need to be “out of the box” and thus learned about persistence and resilience**

# Educational Experience

- **B.A.** in Art Education (1976)
- **M.A.** in Educational Research (1988)
- **Ph.D.** in Educational Psychology with an emphasis in spatial abilities as it applies to visual arts (2000)  
(Dr. David Lohman is my mentor)

## **32 years of teaching experience**

- **1** year kindergarten
- **17** years high school visual arts  
also teaching undergrads at 2 local colleges
- **6** years teacher of gifted and assessment facilitator for elementary schools
- **8** years as an adjunct professor in the UI College of Education division of Quantitative and Psychological Foundations and administrator at the Belin-Blank Center

# **Program Administrator at the Belin-Blank Center**

- National Rural Schools in Gifted Education Program
- Visual Arts Program
- Inventiveness Programs

# **National Rural Schools in Gifted Education Program**

**Research reports** on the status of gifted education in rural schools in the United States (3 reports, available online)

**Wallace National Rural Conferences and Small School Summits**

**Support of rural schools** through the *Iowa Online AP Academy* and networking with schools for other Belin-Blank programs

# **The Mary Bucksbaum-Scanlan Program in the Visual Arts**

*“Vision is the art of seeing things invisible.”*

Jonathan Swift

***The Program in the Visual Arts will provide young, promising artists opportunities to develop their talents.***



## The components of the Program include:

- *student and educator classes and workshops*
- *special arts events and projects*
- *research in identification and development of artistic talent (**future development**)*





**The elementary level classes** (academic year, WINGS and summer, ChESS) provide arts enrichment to promote awareness of the language and processes of art.

**Middle school students** who demonstrate high levels of artistic ability and achievement are nominated by their schools for participation in a two-week residential program (**Blank Summer Institute, BSI**).

Studio-based experiences and exposure to multiple genres in the visual arts expand talents.





**The Visual Arts Institute (VAI)**  
is a one-week residential  
summer program for artistically  
talented students who are  
currently in 9th-11th grades.





## Other specialty programs for students and educators include:

- *Art Scholastics Regional Competition*
- *Vision of Inventiveness* art contest
- Artist-in-residence events
- Educator workshops
- Professional development in AP courses & portfolio preparation

The Visual Arts Program promotes art responsiveness through special projects and by sharing of the distinct collection of artworks displayed in the Blank Honor Center.



**The art collection includes works by international, national, local, and student artists.**



# Inventiveness Programs



# Invent Iowa

- 👉 **K - 12 program**
- 👉 **More and more students each year (estimated 30,000)**
- 👉 **All geographic areas of Iowa—and beyond! (India, Columbia, Bolivia)**
- 👉 **Not bound by**
  - **Gender**
  - **Race**
  - **Economic Status**



# A Motivational Program

- Hands-on learning
- “Real-life” problems

😊 tudents don't

😊 *“ It's kind of fun to do the impossible.”*



# Invent Iowa Process

☞ **Brainstorming**

☞ **Application of some model of problem solving**

☞ **Solution identification or Inspiration**

☞ **Inventor's journal**

☞ **Model or prototype**

☞ **Display board**

☞ **Invention convention Presentations**



# **Invent Iowa**

- **Now in its 22<sup>nd</sup> year**
- **Connections to National Standards in science, language arts, arts**
- **Creativity through invention:  
Creative and critical thinking, Science and technology, Reading, Research, Writing, Art, Persuasive speaking**
- **Curriculum available to all teachers (free on Web– also in Spanish)**

# Why Inventiveness?

It is important to promote inventiveness because inventiveness *is a talent* not usually identified and nourished in the traditional curriculum of schools.

***Creativity:***

***Issues/Applications in Gifted Education***

***“The most powerful way to develop creativity in your students is to be a role model. Children develop creativity not when you tell them to, but when you show them.”***

**When you invite students to try something, it is important for you to do it first.**

**If you want to build a boat, do not instruct the men to saw wood, stitch the sails, prepare the tools and organize the work, but make them long for setting sail and travel to distant lands.**

**— Antoine De Saint-Exupéry**

# *Theories and Models of Creativity*

**A mystical process resulting from a kind of divine intervention and manifested in bursts of insight. (Plato)**

**Explainable by natural laws, just like other thinking processes. (Aristotle, later used by Perkins, Guilford, Weisberg)**

**Stages and Process Approach. (Wallas, Csikszentmihalyi, Maslow, Vygotsky)**

**Interactive theory: use of cognitive process, functioning in particular field or domain, environment (culture & time period). (Sternberg, Gardner, Csikszentmihalyi, Amabile)**

# Who is Creative?

## What is the Definition for Creativity?

- Think of the most creative individual you know.
- How do you define creativity?
  - How is this definition influenced by your culture?

# ***Definitions***

***“Man’s capacity to produce new ideas, insights, inventions or artistic objects, which are accepted of being of social, spiritual, aesthetic, scientific, or technological value.”***

*The Dictionary of Developmental and Educational Psychology (1986)*

***“Creativity is any act, idea, or product that changes an existing domain, or that transforms and existing domain into a new one.”***

Csikszentmihalyi, Creativity, 1996

# Creativity vs creativity

Csikszentmihalyi

- Lower case “c” creativity: *Personally creative*
  - Experience the world in novel and original ways
  - Perceptions are fresh
  - Judgments are insightful
  - May make important discoveries that only they know about

# Capital “C” Creativity

## Systems Model:

- 1) Domain, consists of a set of symbolic rules and procedures
- 2) Field, individuals who act as gatekeepers to the domain.
- 3) Individual person, using symbols of domain has a new idea or sees a new pattern, changing a field/domain, sometimes becomes new domain

# Capital “C” Creativity

Individuals who have changed our culture in some important respect:

- Leonardo da Vinci
- Sigmund Freud
- Stravinsky
- Graham
- Einstein
- Others from your country?

# Domain Specific

Visual Artists  
Creative Writers  
Musician &  
Composers  
Actors & Dancers

Expressive creativity  
*Originate a product as an illustration of the creator's emotional & aesthetic senses*

Creative Scientists,  
Mathematicians, &  
Inventors

Adaptive creativity  
*Addresses a worthwhile problem & results in a novel & and appropriate solution*

***It is the tension between creativity and skepticism that has produced the stunning and unexpected findings of science.”***

***— Carl Sagan***

# **Creative development & Creativity/Eminence/Genius**

## **Amabile's components of creativity**

- **1) domain relevant skills or existing knowledge**
- **2) task motivation**
- **3) creativity relevant skills**

# Creativity and the 4-P's

- **Person**
- **Process**
- **Product**
- **Press**

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# Creative Giftedness as a Decision-Making Skill

***“Students who fail to acquire a flexible and creative attitude toward life are at risk for obsolescence, not only in their knowledge, but also in their skills for coping with life.”***

-Robert Sternberg (2000)

# **Sternberg's Ten Decisions Characteristic of People Who Decide for Creativity**

- 1. Redefine Problems**
- 2. Analyze Your Own Ideas**
- 3. Sell Your Ideas**
- 4. Knowledge as a Double-Edged Sword**
- 5. Surmount Obstacles**
- 6. Take Sensible Risks**
- 7. Willingness to Grow**
- 8. Believe in Yourself**
- 9. Tolerance of Ambiguity**
- 10. Find What You Love to Do and Do It**

# Creative Person: Motivation and Personality/Abilities

- Goal-directedness
- Fascination for a task or area
- Resistance to premature closure
- Risk-taking
- Preference for asymmetry
- Preference for complexity
- Willingness to ask many (unusual) questions
- Willingness to display results
- Willingness to consult other people (but not simply carry out orders)
- Desire to go beyond the conventional
- Active imagination
- Flexibility
- Curiosity
- Independence
- Acceptance of own differentness
- Tolerance for ambiguity
- Trust in own senses
- Openness to sub-conscious material
- Ability to work on several ideas simultaneously
- Ability to restructure problems
- Ability to abstract from the concrete

# **Other Characteristics of Creative Individuals???**

**(See Davis chapter in Handbook of Gifted Education...)**

**What social/emotional problems  
may be associated with a highly  
creative individual?**

# **What social/emotional problems may be associated with a highly creative individual?**

- **Research on emotional health of artistically gifted adults (Andreasen, 1988; Jamison, 1989, 1993; and others).**
- **Mood disorders: alteration of mood, certain types of thinking processes, and a tolerance for irrationality.**

# **Csikszentmihalyi, 1996**

## **Study of Talented Teenagers**

- **Indirect support for hypothesis that creatively gifted adolescents are more psychologically vulnerable than academically or intellectually gifted peers...**
  - **Pursuit of high creative achievement may result in reduced popularity and possible increase in marginalization/alienation from peers**
  - **Can not be exceptional and “normal” at the same time**
  - **More time spent alone, more time for mental play appears to inhibit sexual awareness & independence**

***And if everybody says that you are wrong, then you are one step ahead. But there is one situation which is better still, when everyone begins to laugh about you, then you know you are two steps ahead.”***

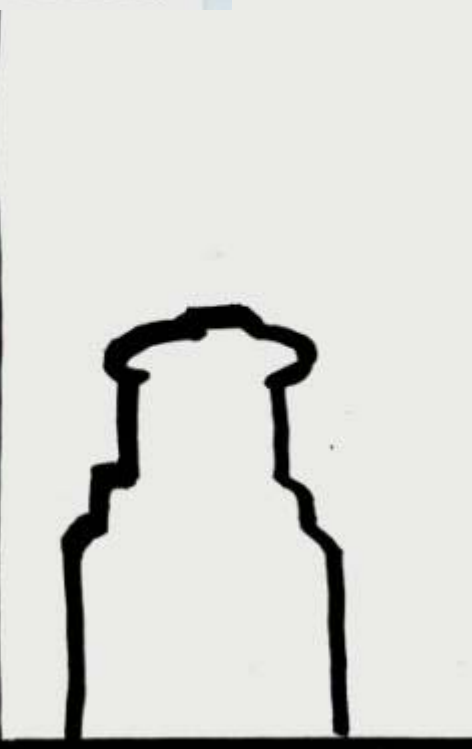
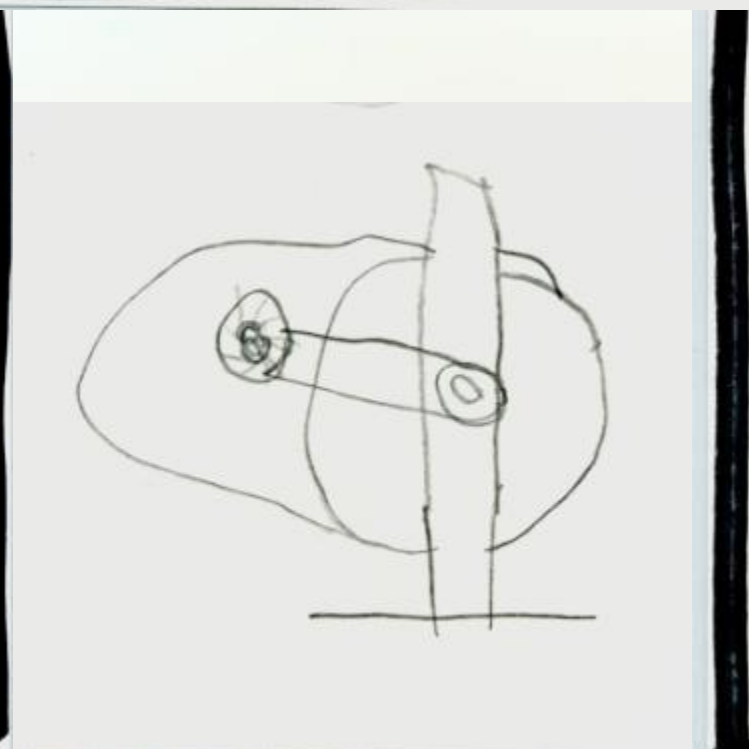
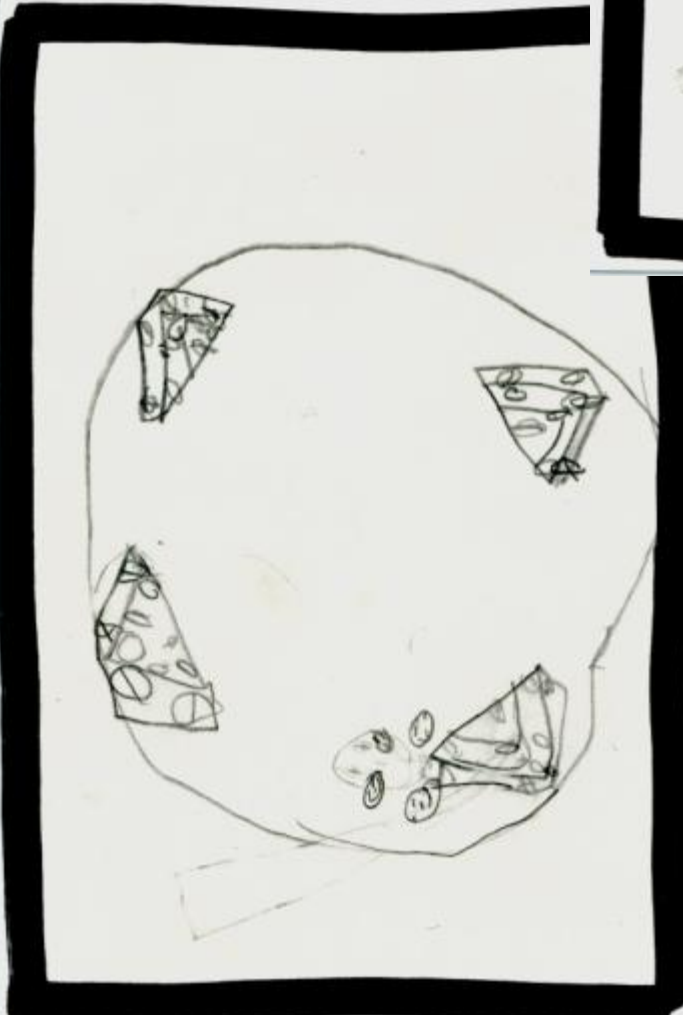
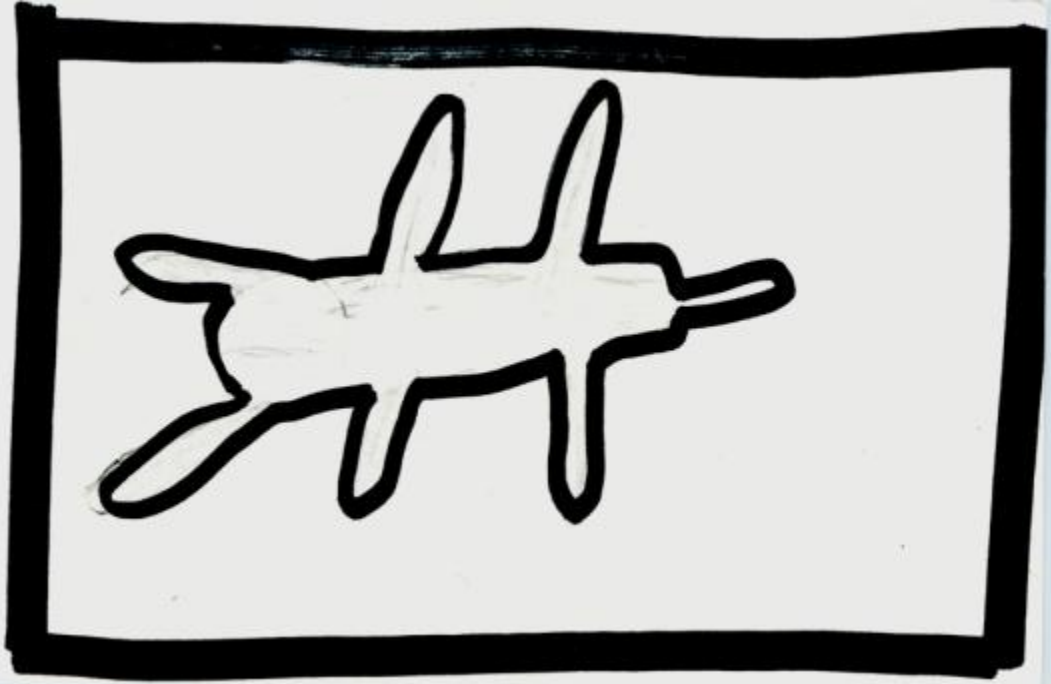
***-Albert Szent-Gyorgi (Nobel-prize winning biochemist who discovered vitamin C)***

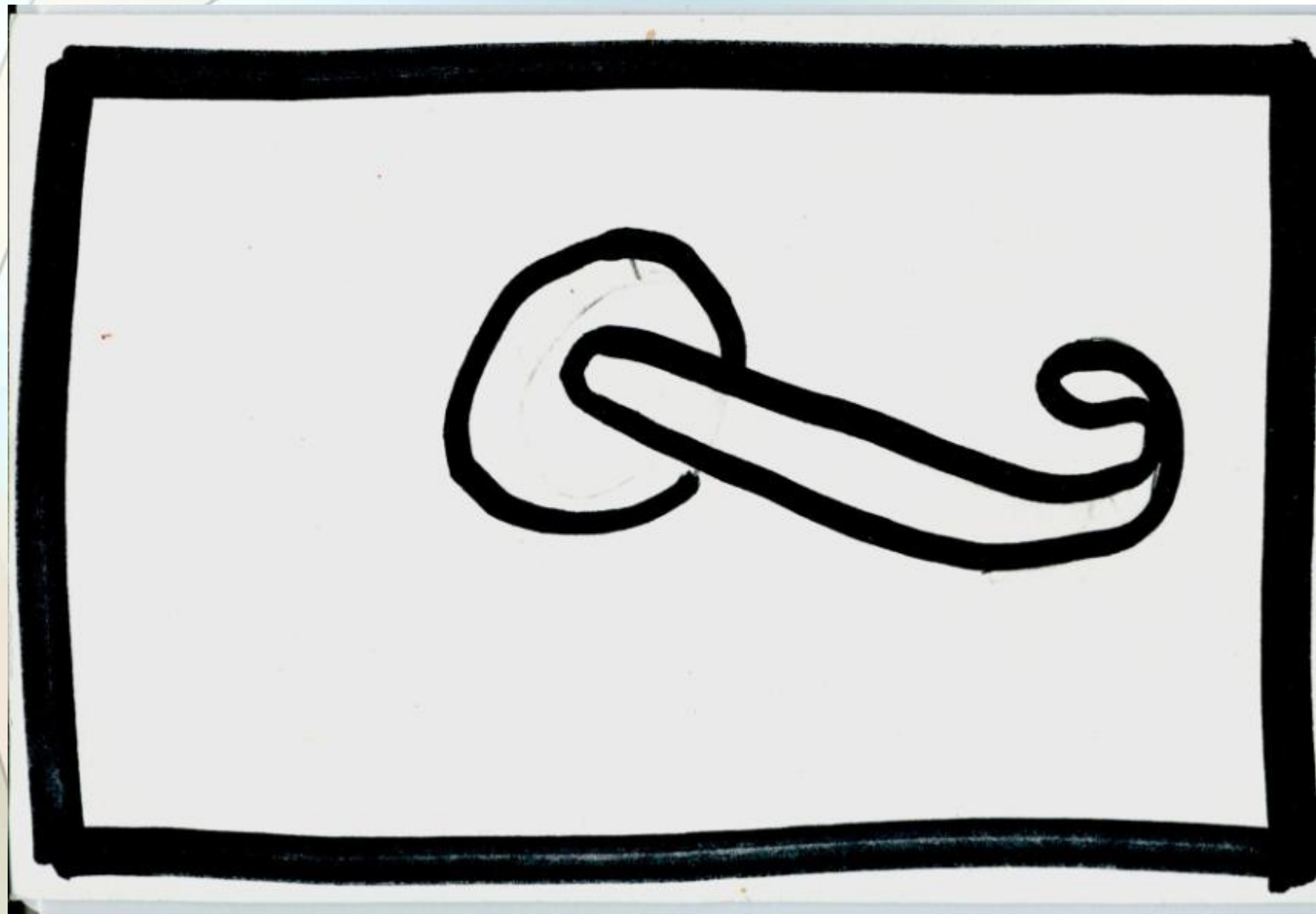
# **But is creativity innate or can it be developed?**

- **“g” vs specific abilities**
- **Athletic ability vs specific sports  
(ballet, basketball, soccer, etc.)**
- **Fluid abilities and crystallized  
abilities**
- **General “c” vs specific “c”?**

# Creativity

- **Why is it important to encourage, promote, support, advocate for, develop, expand, cultivate, extend, and guide creativity in our students—especially those who are gifted?**





# Creativity and the 4-P's

- **Person**
- **Process**
- **Product**
- **Press**

# Educational Tools

**“If the only tool you have is a hammer, you treat almost everything as if it were a nail.”**

Elliot W. Eisner, 1997  
*Cognition and Representation*

# Breaking Sets and Functional Fixedness

## **Problem #2**

- **Can creativity be measured?**

# Tests of Creativity

**Creativity Tests for Children, Guilford, 1976**  
**Torrance Tests of Creative Thinking,**  
**Torrance, 1966, 1999**

**Remote Associate Test, Mednick, 1962**

**Triarchic Abilities Test: Analytical,  
Practical, and Synthetic Abilities,**  
**Sternberg, 1997**

# Identifying Creative Individuals

- **1) Did you have and imaginary playmate?**
- **2) Have you been involved in theatre?**
- **Past and present creative activities**

# Process

## **J.P. Guilford: Divergent production as a factor of intellect (1950)**

- **Fluency**
- **Flexibility**
- **Novelty**
- **Synthesizing ability**
- **Analyzing ability**
- **Reorganization or redefinition of already existing ideas**
- **Degree of complexity**
- **Evaluation**

# The Creative Process

- **“Uncensored” perception and encoding of information**
- **Fluency of ideas**
- **Problem recognition and construction**
- **Unusual combinations of ideas**
- **Construction of broad categories**
- **Recognizing solutions**
- **Transformation and restructuring of ideas**
- **Seeing implications**
- **Elaborating and expanding ideas**
- **Self-directed evaluation of ideas**

# Creativity Measures: Product

- Originality
- Relevance
- Usefulness
- Complexity
- Understandability
- Pleasingness
- Elegance/Well-craftedness
- Germinality

- Creative Product Inventory, Taylor, 1975
- Creative Product Semantic Scale, Besemer & O'Quin (1987, 1999)
- Invent Iowa Evaluation Rubric, Kratz, et. al., 2000

# Some Good Resources for Information on Creativity Measures

- **Center for Creative Learning**

**<http://www.creativelearning.com/Assess/index.html>**

- **National Research Center on the Gifted and Talented**

**<http://www.gifted.uconn.edu/nrcgt/resource.html#02170>**

- **Test reviews online, e.g. Buross MMYB**

**<http://buross.unl.edu/buross/jsp/search.jsp>**

# **APPLICATIONS**

# Four Stage Model of Creativity

- **Preparation**
- **Process**
- **Incubation**
- **Solution/Judgment**

# 4-Stage Model: Preparation

## Problem finding...

***“The mere formulation of a problem is far more often essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advances in science.”***

— Albert Einstein

# 4-Stage Model: Preparation

- **Information/Data gathering**

**Infovore: innate hunger for information--craving for certain types of stimuli, then proceeds to more sophisticated levels of perception and cognition that draw on associations the brain makes with previous experiences. (Biederman & Vessel, Am. Scientist M-J 2006)**

# 4-Stage Model: Process

Depends on the Domain

Typically described as divergent thinking

Problem Solving Models

Creative Programs and Workshops

How-to books

# 4-Stage Model: Process

**"Throwing away ideas too soon is like opening a package of flower seeds and then throwing them away because they're not pretty."**

**— Arthur VanGundy, Ph.D. (*Idea Power*, 1992)**

# SCAMPER

- **Substitute**
- **Com+bine**
- **AΩ☪□◆ αδαπτ Adapt**
- **Minify**
- **Magnify**
- **Put to other uses**
- **Eliminate**
- **Reverse = esreveR**
- **Rearrange**

Sparks of Genius: 13 Thinking Tools of the World's Most Creative People, Root-Bernstein, 1999

**observing**

**imaging**

**abstracting**

**recognizing  
patterns**

**forming patterns**

**analogizing**

**body thinking**

**empathizing**

**dimensional  
thinking**

**modeling**

**playing**

**transforming**

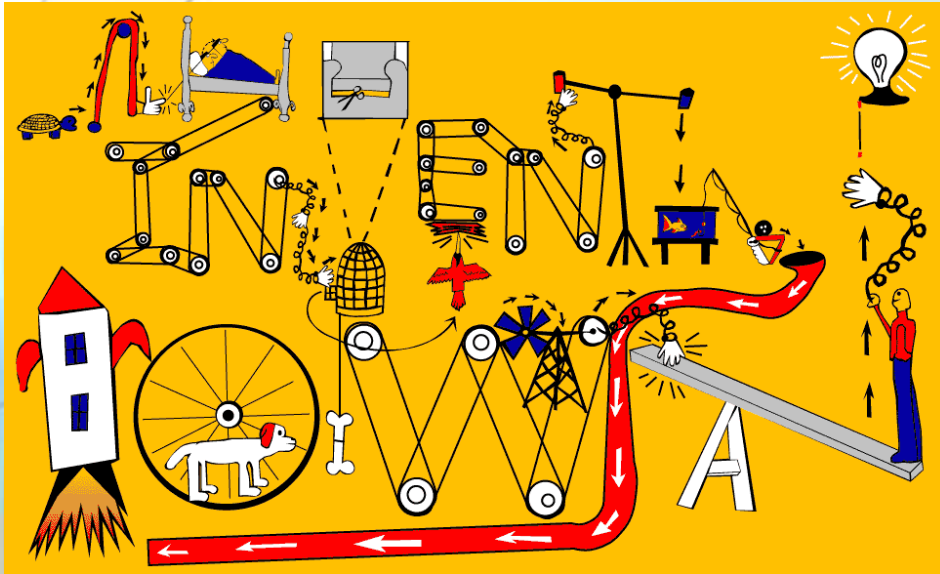
**synthesizing**

# *Process:*

## *Creativity Programs, Models, & Training*

- **Creative Problem Solving- CPS (Treffinger)**
- **SCAMPER (Eberle, 1971)**
- **Talents Unlimited (Taylor)**
- **Invention Programs: Invent Iowa**
- ***Manifesto for Children* by E. Paul Torrance**  
(the gospel according to Paul)
- **Synectics (Gordon)**
- **Visual Thinking (McKim)**
- **CoRT Thinking Program (deBono)**
- **Six Hats (deBono)**
- **Future Problem Solving (Torrance, 1974)**
- **Odyssey of the Mind**  
<http://www.odysseyofthemind.com/>
- **Destination ImagiNation™**
- **Others?**

# Invent lowa & Vision of Inventiveness



# 4-Stage Model: Incubation/insight

**Kekule**, famous for his dream-inspired scientific breakthrough—discovering the molecular structure of benzene, advised his fellow scientists: "Let us learn to dream, gentlemen."

**It is by intuition that we  
discover and by logic we  
prove.**

**–Henri Poincaré, Mathematician**



It's all about balance...

*Between divergent and convergent thinking...*

# 4-Stage Model: Solution/Judgment

***“And if everybody says that you are wrong, then you are one step ahead. But there is one situation which is better still, when everyone begins to laugh about you, then you know you are two steps ahead.”*** Albert Szent-Gyorgi (Nobel-prize winning biochemist who discovered vitamin C)

# Creativity and the 4-P's


- **Person**
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# Creativity: Press

- **Environment**
- **Field/Peers**
- **Resources**

***“Great spirits have always  
encountered violent opposition from  
mediocre minds.”***

***— Albert Einstein***

**What  
Carl's  
Teacher  
Saw** 



# What Carl Saw



- **In what ways do “we” stifle creativity?**
- **How can we encourage creativity in our teaching environment?**

# *Manifesto for Children*

by E. Paul Torrance (the gospel according to Paul)

**Do what you love and can do well.**

Learn to free yourself from the expectations of others and to walk away from the games they impose on you. Free yourself to **play your own game.**

Learn the skills of interdependence and gladly share your infinite creativity.

*Know, understand, take pride in, practice,  
practice, practice, develop, exploit, enjoy your  
strengths.*

**Don't be afraid to fall in love with something and  
pursue it with **intensity**.**

Don't waste time being **well rounded**.

Find a great **TEACHER** or **MENTOR** who will help you.

# Ekvall's Innovative Environment

- **RESOURCES**
- **1. Idea Time**
- **2. Idea Support**
- **3. Challenge and Involvement**
- **PERSONAL MOTIVATION**
- **4. Trust and Openness**
- **5. Playfulness and Humor**
- **6. Absence of Interpersonal Conflicts**
- **EXPLORATION**
- **7. Risk-Taking**
- **8. Debates About the Issues**
- **9. Freedom**

# Resources--Among Many

- Sparks of Genius: The 13 Thinking Tools of the World's Most Creative People, **Robert & Michèle Root-Bernstein**
- The Creating Brain: The Neuroscience of Genius, **Nancy C. Andreasen, M.D., Ph.D.**