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DISSECT: A Framework for Effective Inclusive Instruction in Science

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DIS_2ECT

A Framework for Effective Inclusive Instruction in Science

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Significance of this session

- Science instruction is often secondary to improving literacy and math skills (Scruggs, Mastropieri, Okolo, 2008)
- However, NCLB (2001) and IDEA (2004) stipulate that students with disabilities must have access to the general education curriculum, and hold schools responsible for assessment.
- But most importantly . . .

The **opportunity** to learn!

Essential Questions

- How can special education and general education teachers ***collaborate*** to effectively include students with disabilities in the general education curriculum?
- How can teachers ***effectively plan*** to ensure all students succeed in science?
- What are ***research based best practices*** for teaching science in inclusion classrooms?

K-U-D for Session

- **Know**
  - Strategies for including students with disabilities in the general education science curriculum
- **Understand**
  - What the research says about effective instructional practices
- **Do**
  - Develop lessons that are based on best practices so *all* children learn science

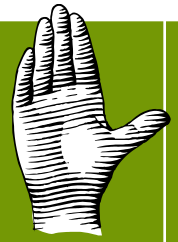
But first…

… let’s do some science!

Properties of Objects

- Using your eyes, what words can we use to describe our crystals?
- Using your ears, do you hear anything?
- Use your nose, do the crystals smell?
- Use your hand, what words can we use to describe how the crystals feel?

Make Observations:

See 	Hear 	Smell 	Feel 	Taste 
What size is it? What shape is it?	Do you hear a sound?	Does it smell/odor?	Does it feel soft/hard? Does it feel light or heavy?	X

Connections

It reminds me of _____

because_____.

What are you curious about?

What happens when we put these crystals in water?

- What steps could we take to find out?
- Think-Pair-Share

What did you find out?

- *Before* we put the crystals in water?

- *After* we put the crystals in water?

Change

- Does change always happen slow or fast?
- What could we change about our materials that might affect how fast or slow the crystal changes?

Ideas

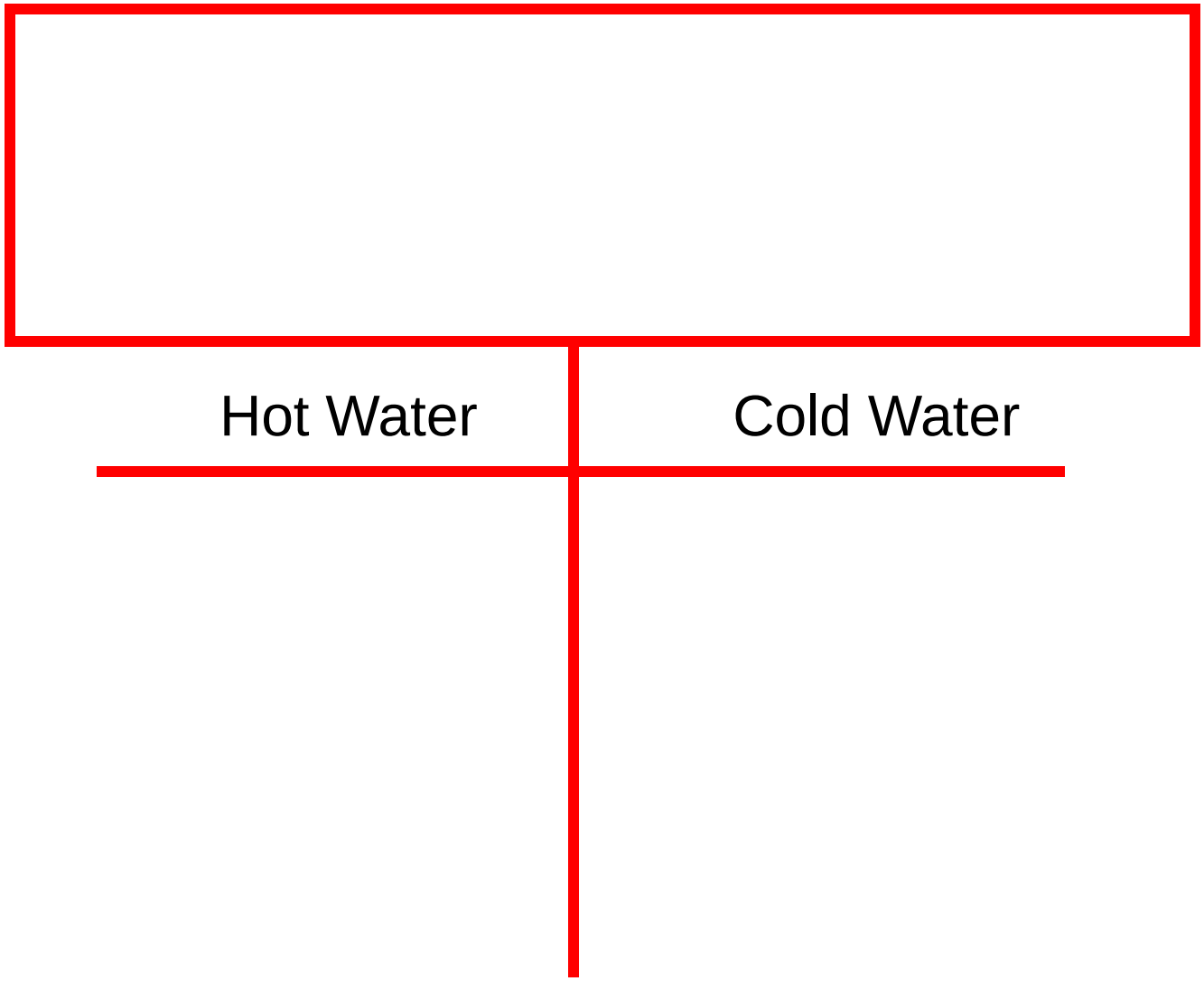
Crystal	Water

What could we observe?

Did changing the temperature make a difference on how fast the crystals changed?

THE BOX & T-CHART

Similarities



Differences

COMPARE AND CONTRAST

Writing Frame

Start with how things are the same or similar.	The _____ and the _____ are the same because they both _____.
Add more details as needed.	In addition, they both _____.
Explain how they are different. You can compare the same property or characteristic in the same sentence. Use "and", "but", or "whereas" to set up the contrast.	They are different because the _____, but the _____ does not.
Add more detail as needed.	Also, the _____, whereas the _____ does not.

Betsy Rupp Fulwiler

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A Framework for Effective Inclusive Instruction in Science

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Design (Backwards)

Individualization

Scaffolding

- **S**trategies

Experiential learning

Cooperative Learning

Teaming

Backward **D**esign

(Wiggins & McTighe, 2006)

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- 1) Identify learners
  - Disabilities/IEPs, SES, learner profiles, interest inventories, student records, etc.
- 2) Identify curricular priorities
  - State and local standards, essential questions/big ideas, assess prior knowledge and skills
- 3) Design assessment framework
  - Performance tasks, oral/written prompts, tests/quizzes, informal assessments, (observations, activities, discussions, questions)
- 4) Create learning activities
  - Design and sequence learning activities
  - Check for integration of accommodations

(See also Childre, Sands, & Pope, 2009)

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Individualization:
The Centerpiece of Special Education

Characteristics of Students with Disabilities

- Difficulty with inductive and deductive thinking skills (which are associated with scientific reasoning)
- Often reading below grade level (and therefore below the level of the textbook)
- Require significant practice, repetition, feedback, and reinforcement
- Limited independent study strategies

Ways to Individualize/Differentiate

- Differentiating Unit
  - Content
  - Process
  - Product
- By
  - Readiness
  - Interest
  - Learning Profile

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Scaffolding

- Text enhancements
  - Graphic organizers
  - Framed outlines
  - Mnemonic illustrations
- Peer tutoring
- Cooperative learning
- Higher order questioning
- Coached elaborations
- Word walls
- Pre-teaching essential vocabulary
- Strategic tutoring

Strategy Instruction

- Meta-cognitive strategies
  - Self-monitoring
  - Self-regulation
  - Self-questioning
- Independent study strategies
- Summarization strategies
  - Main ideas
  - Lists
  - Sequences
- Self developed mnemonics

Moving from Dependence to Independence through Support

I Do	I Do	You Do	You Do
You Watch	You Help	I Help	I Watch
Modeled	**Interactive**	**Guided**	**Independent**
Shared			

Autonomy

Experiential learning

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- Inquiry based instruction
- Constructivist and student centered
- “hands on” science curriculum
- An emphasis on concrete, meaningful experiences (see Scruggs, Mastropieri, & Okolo, 2008)

“Many students with high-incidence disabilities will perform similarly to normally achieving students on a constructivist science task, even though they are far behind in reading and math achievement”

(Mastropieri et al., 2001, p. 131)

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Cooperative Learning

- Types of Grouping
  - Homogeneous
  - Heterogeneous
- Benefits
  - Academic and social
- Activities
  - Think-Pair-Share
  - Jigsaw
  - Numbered Heads Together
  - 3 Minute Interview
  - Round Robin Brainstorming
- Peer tutoring
  - Benefits for both the tutor and tutee
  - Training and monitoring necessary

Teaming

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- **Collaborative Teaming:**
  - "Two or more people working together toward a common goal" (Snell & Jannney, 2000, p. 3)

- **Effective collaboration:**
  - is based on ***mutual goals***
  - Requires ***parity*** among participants
  - Depends on ***shared responsibility*** for ***participation*** and ***decision-making***
  - Requires ***shared responsibility for outcomes***
  - Requires that participants ***share their resources***
  - Is a ***voluntary*** relationship

Teaming Strategies

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- Complementary instruction
- Team teaching
- Supportive learning activities
- Parallel teaching
- Alternative teaching
- Station teaching

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Design (Backwards)

Individualization

Scaffolding

- **S**trategies

Experiential learning

Cooperative Learning

Teaming

Research on inclusion

- “Evidence from inclusive classroom ecologies suggests that individualized instruction for students with disabilities is infrequent and often provides more to accommodate teachers than learners” (Crockett & Kauffman, 1999, p. 148)
- Summarizing a meta-analysis (Kavale &Forness, 2000) on inclusion:
  - The inclusion classroom is generally viewed as “a setting essentially devoid of special education” (p. 283).
  - “Given the magnitude of associated effects, it was evident that placement per se had only a modest influence on outcomes” (p. 282).

Inclusion

- Simply placing students with special needs in a general education setting *is not* inclusion.
- Inclusion is *educating* students with special needs in a general education setting.
- Focus should be on *what* not *where!*

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