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Interactive Notebooks

A Power Tool for Implementing UDL
in the Secondary Science Classroom

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CAST 2013 Presentation Resources

- **The Center for Applied Special Technology (CAST)**
  Educational research and development organization dedicated to expanding learning opportunities for all individuals through universal design for learning (UDL).
  http://www.cast.org

- **National Center on Universal Design for Learning**
  Organization supporting the effective implementation of UDL by connecting stakeholders and providing resources and information.
  www.udlcenter.org

- ***Teaching Science with Interactive Notebooks*** **by Kellie Marcarelli**
  http://www.corwin.com/books/Book231624

- **Lesson Plan to Introduce Notebooking**
  http://phys.csuchico.edu/~ljatkins/SGSI/SGSI_files/Notebooks%20lesson%20plan.pdf

- **Instructions on how to make the mini "bound" book:**
  http://sblc.registereastconn.org/foldables/InterestBoundBook.pdf

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Ten Characteristics of Interactive Notebooks

Adapted from: Marcarelli, Kellie. (2010). *Teaching Science with Interactive Notebooks* (pp. 1-21). Thousand Oaks, CA: Corwin

1. [The interactive notebook is] 'like my own piece of property that I have to take responsibility for. It shows my personal thinking and creativity. My notebook shows I can think for myself and figure out where I went wrong for myself instead of someone telling me.' - Student

2. Homework assignments and practice are built into the use of interactive notebooks, providing valuable processing opportunities.

3. Interactive notebooks connect students' thinking, prior knowledge, and experiences with science concepts.

4. Interactive notebooks develop academic language. It provides a safe place to practice writing, express prior knowledge, and record newly acquired knowledge.

5. Notebooks encourage active learning and provide opportunities for students to pursue their own interests and tackle authentic problems.

6. Notebooks facilitate communication with parents, teachers, and specialists and can be used to provide them with evidence of student growth and facilitate development of intervention strategies.

7. Notebooks provide an ongoing record of student work and growth, leading to recognition from their peers, teachers, and parents.

8. Questions are present throughout students' interactive notebooks, and the notebooks are richly littered with graphic organizers.

9. Science notebooks engage students in collaborative inquiry as a way of learning science content by recording data and observations and engaging in reflective thinking, discussion, and analysis.

10. Students take notes and illustrate their observations as they complete science investigations and create different kinds of graphs to represent their data.

Universal Design for Learning Guidelines

I. Provide Multiple Means of **Representation**

1: Provide options for perception

1.1 Offer ways of customizing the display of information

1.2 Offer alternatives for auditory information

1.3 Offer alternatives for visual information

2: Provide options for language, mathematical expressions, and symbols

2.1 Clarify vocabulary and symbols

2.2 Clarify syntax and structure

2.3 Support decoding of text, mathematical notation, and symbols

2.4 Promote understanding across languages

2.5 Illustrate through multiple media

3: Provide options for comprehension

3.1 Activate or supply background knowledge

3.2. Highlight patterns, critical features, big ideas, and relationships

3.3 Guide information processing, visualization, and manipulation

3.4 Maximize transfer and generalization

Resourceful, knowledgeable learners

II. Provide Multiple Means of **Action and Expression**

4: Provide options for physical action

4.1 Vary the methods for response and navigation

4.2 Optimize access to tools and assistive technologies

5: Provide options for expression and communication

5.1 Use multiple media for communication

5.2 Use multiple tools for construction and composition

5.3 Build fluencies with graduated levels of support for practice and performance

6: Provide options for executive functions

6.1 Guide appropriate goal-setting

6.2 Support planning and strategy development

6.3 Facilitate managing information and resources

6.4 Enhance capacity for monitoring progress

Strategic, goal-directed learners

III. Provide Multiple Means of **Engagement**

7: Provide options for recruiting interest

7.1 Optimize individual choice and autonomy

7.2 Optimize relevance, value, and authenticity

7.3 Minimize threats and distractions

8: Provide options for sustaining effort and persistence

8.1 Heighten salience of goals and objectives

8.2 Vary demands and resources to optimize challenge

8.3 Foster collaboration and community

8.4 Increase mastery-oriented feedback

9: Provide options for self-regulation

9.1 Promote expectations and beliefs that optimize motivation

9.2 Facilitate personal coping skills and strategies

9.3 Develop self-assessment and reflection

Purposeful, motivated learners

CAST

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Welcome!

Interactive Notebooks-

A Power Tool for Implementing UDL in the Secondary Science Classroom

Presenter: Elisa Lewis
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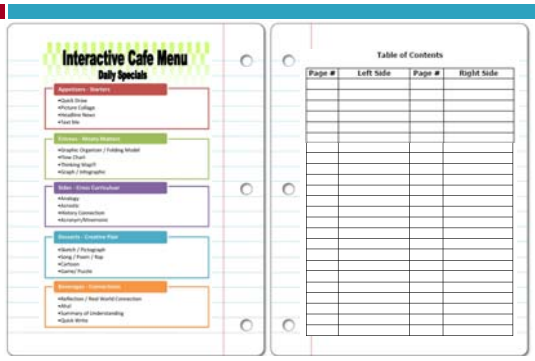
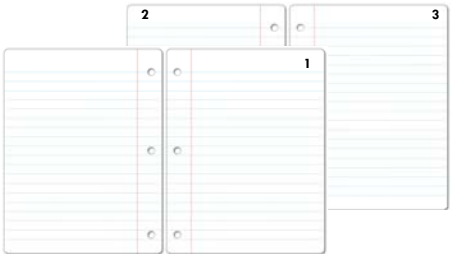
Tape in the first two pages.



Number the rest of the pages 1-8.



Session Goals

- How do INB strategies support implementation of UDL?
- How do INBs provide cognitive challenge across the spectrum of student ability?

Notable Notebooks

What are the similarities and differences between the sample scientists' notebooks?

Create a graphic organizer on page 1 to organize your observations.

similarities	differences

Which Surface Is the Most Waterproof?

- Answer the investigative question using the materials provided.
- Record the question and your observations on page 3 of your notebook.

Surface	Interaction with Water	
Conclusion:		

Which Surface Is the Most Waterproof?

- Record your conclusion and explain your reasoning.

Surface	Interaction with Water	
Conclusion:		

Create a Definition from Root Words

Given the root word meanings create a definition for each word on page 5 of your notebook and use it in a sentence.

- **Hydrophilic**
- **Hydrophobic**

hydro = water

philic = lover of

phobic = fearful of

Look up the definitions in a glossary or dictionary. How close are your definitions?

Which Surfaces are Hydrophilic/Hydrophobic?

- Go back and categorize each surface as either hydrophilic or hydrophobic in the last column of your data table.

Surface	Interaction with Water	hydrophilic or hydrophobic?
Conclusion:		

Do we have consensus?

Surface	Interaction with Water	Hydrophilic or Hydrophobic?
1. 100% cotton paper		hydrophilic
2. plain copy paper		hydrophilic
3. waxed paper		hydrophobic
4. newspaper		hydrophillic
5. bakery paper		hydrophobic
6. waterproof paper		hydrophobic
7. paper treated with waterproof spray		hydrophobic
8. card stock		hydrophilic

Coffee Talk

Input ➡ Output

What are different ways to process, organize, and remember what you learn?

Create Your Own Left Side

- Review the ways you can process, organize, and remember what you learn.
- Choose a strategy (from the menu or on your own) and complete your first left side.

Right Sides vs. Left Sides

2

Left Page = Output

Reflection Side
Student Directed

- Drawings
- Poems
- Cartoons
- Graphic organizers
- Word puzzles
- Internet pictures/graphics
- Newspaper article
- Songs
- T-shirt design
- Reflections

Entries Chosen and Monitored

3

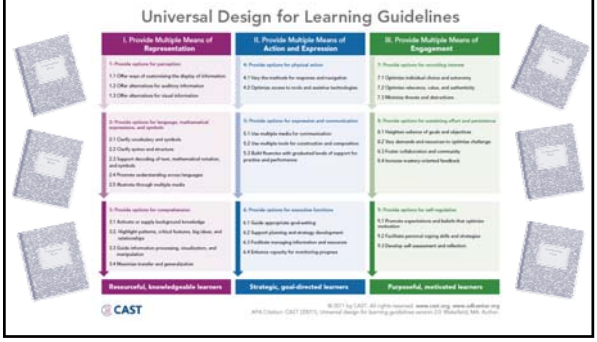
Right Page = Input

Information Side
Teacher Directed

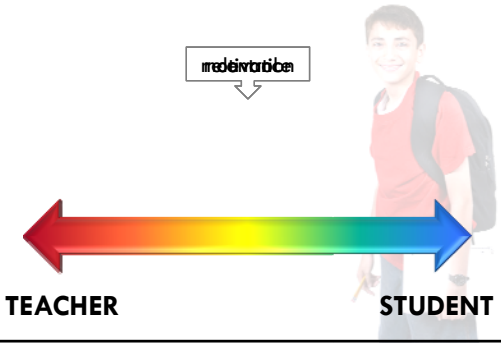
- Warm-ups
- Lecture or textbook notes
- Worksheet
- Labs
- Handouts
- Quizzes and tests
- Homework
- Exit ticket questions

Entries Assigned and Assessed

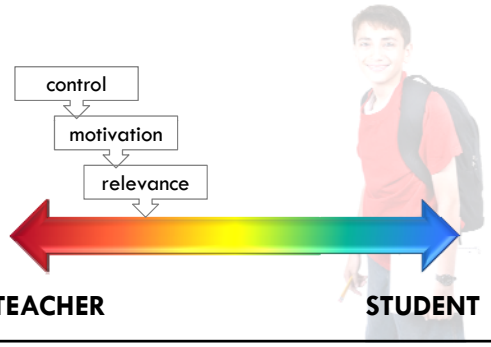
How Do INBs Align with UDL?



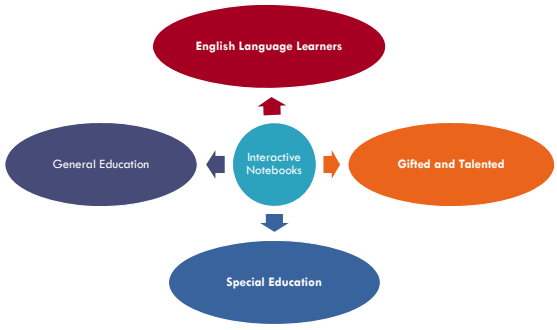
Basic Science Notebook



Interactive Science Notebook



How Do INBs Support All Students?



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