Differentiation Strategies for Science
Teacher Created Materials

• A family owned company
• Founded more than 33 years ago
• Trusted name among PreK-12 educators
• Develops curriculum solutions and professional resources
• Materials have been used in the U.S. and over 95 countries
Hello and Welcome!

• Academic Officer
• Instructional Coach
• Intervention Coordinator
• Reading and Writing Specialist
• Other…

Hillary Wolfe
Drawing!
Learning Objectives

I. Differentiation 101

II. Strategies

• Tiered Assignments
• Tiered Graphic Organizers
• Leveled Questions
• Multiple Intelligences
• Menu of Options
• Interest Centers
Differentiation 101

Anticipation Guide

Determine if each statement is true or false.

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Statement</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There is only one right way to differentiate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>You have to differentiate all the time to be effective.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Differentiation cannot include whole-group instruction.</td>
<td></td>
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<tr>
<td></td>
<td>Differentiation doesn't work when you're worried about high-stakes testing.</td>
<td></td>
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<tr>
<td></td>
<td>Differentiation is only for students in special education.</td>
<td></td>
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<tr>
<td></td>
<td>Differentiation is the same thing as individualization.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Differentiation encourages mastery for all students.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is no fair way to grade differentiated assignments.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above-grade level students should be used as tutors for below-grade level students.</td>
<td></td>
</tr>
</tbody>
</table>
“Differentiation is simply a teacher attending to the learning needs of a particular student or small groups of students, rather than teaching a class as though all individuals in it were basically alike.”

—Carol Ann Tomlinson (2000)
To ensure a fair selection you all get the same test. You must all climb that tree.
Differentiation 101

What Is Your Lane?

Families and Special Assistance
- small children; strollers
- groups
- assistance needed
- new to flying

Casual Traveler
- familiar with TSA procedures
- multiple carry-ons

Expert Traveler
- expert at TSA procedures
- always ready with items removed
- flies more than twice a month
- travels light
- elite frequent flyer member

got feedback?
www.tsa.gov/blog
Differentiate because of . . .

- readiness levels
- learning styles
- interests
Differentiation 101

- **Content:** What is taught
- **Process:** How it is taught
- **Product:** Work student creates to show their learning
Differentiation 101

Content

- Tricycle
- Father and Son on a bike
- Professional cyclist

Teacher Created Materials Publishing
Differentiation 101

Product
Differentiation 101

Grouping Strategies

• Flexible
• Heterogeneous
• Homogeneous
• Flexogeneous
Differentiation 101

Anchor Activities
Differentiating by Content
(what the students learn)
Strategies

Differentiating by Content

You can’t learn much from books you can’t read.

—Educational Leadership
Strategies

Differentiating by Content

Tiered Assignments

Leveled Text

Tiered Graphic Organizers
Strategies

Differentiating by Content

English language learners fit into all three categories.
Strategies

Differentiating by Content

Tiered Assignments

1. What is it?
2. Why use it?
3. How do I use it?
Stickers and Attributes

- Sort the stickers by attributes.
- Write the attributes in the first column of the table.
- Draw an example of the stickers in the second column.
- Answer the questions.

You Try It!

Tiered Assignments

pages 3 and 4 in your handout
Tiered Assignments

• How was this lesson tiered?

• Think of an activity you could tier in a similar way.
### Strategies

#### Differentiating by Content

**Leveled Text**

1. **What is it?**
2. **Why use it?**
3. **How do I use it?**

<table>
<thead>
<tr>
<th>Title of the Text</th>
<th>Star</th>
<th>Circle</th>
<th>Square</th>
<th>Triangle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet Streams and Trade Winds</td>
<td>1.9</td>
<td>3.1</td>
<td>4.7</td>
<td>6.5</td>
</tr>
<tr>
<td>The Water Cycle</td>
<td>1.6</td>
<td>3.1</td>
<td>4.7</td>
<td>6.5</td>
</tr>
<tr>
<td>Tornadoes and Hurricanes</td>
<td>1.8</td>
<td>3.4</td>
<td>4.6</td>
<td>6.7</td>
</tr>
<tr>
<td>Structure of the Earth</td>
<td>2.1</td>
<td>3.5</td>
<td>5.2</td>
<td>6.5</td>
</tr>
</tbody>
</table>
Strategies

**Leveling Text**

- Shorten sentences
- Define vocabulary—grade level content words
- Use strategically academic language
- Try not to use pronouns
- Give context to names
Atoms

• Read the passage (both sides).

• Turn to a partner.

• How is the text similar? How is it different?
Differentiating by Content

Tiered Graphic Organizers

1. What is it?
2. Why use it?
3. How do I use it?
Differentiating by Content

Tiered Graphic Organizers

• Change what is expected
• Change the number of items needed to be listed
• Change the resources
• Change the look of the organizer
You Try It!

Differentiating by Content

Tiered Graphic Organizers

- Read the passage on force and mass
- Fill out one of the graphic organizers
Tiered Graphic Organizers

• How was this graphic organizer tiered?

• How could you adapt this activity to your classroom?
Differentiating by Process
(how the students learn)

Three-Story Intellect Overview

There are one-story intellects, two-story intellects, and three-story intellects with skylights. All fact collectors who have no aim beyond their facts are one-story people. Two-story people compare reason and generalize, using labors of fact collectors as well as their own. Three-story people idealize, imagine, and predict. Their best illuminations come from above through the skylight.

This quotation is from Oliver Wendell Holmes, a physician and author who lived in the 1800s. Art Costa applied Holmes's quote to academics and produced the three-story intellect model (Costa and Marzano 1987). This model is similar to Bloom's taxonomy, except that it categorizes thinking into three levels instead of six. The three levels work together to process information much like the brain works. First the brain gathers information, then processes it for understanding, and finally uses the information.

Level I, called the Gathering or Input Phase, describes how students gather information through their senses. This is the foundation for higher-level thinking. Students learn to state problems in their own words, observe and gather information for making decisions, create goals, and connect information with previous experiences.

Level II is the Processing Phase. Information is processed to make it meaningful. Students build on the foundation of skills in Level I by comparing, inferring, organizing, and questioning information.

In Level III, the Applying Phase, students incorporate all the levels of thinking. They generate new ideas by predicting, judging, imagining, and evaluating.

It is not necessary to advance in our thinking in a particular order. Thinking can begin at any level. For example, if you give students a problem to solve, they are beginning at Level III. A problematic situation is one of the best ways to get students excited about learning. When students are confronted with a problem (Level III), they have to gather information (Level I), process it (Level II), and then, return to the problem (Level III) to make a final decision.
Differentiating by Process

Leveling Questions

Start with the Whole Class Topic

Open up the Question

Narrow the Question

Add Context to the Language
Strategies

Differentiating by Process

Describe how you use Newton’s Laws of Motion.

(grade level)
Differentiating by Process

- Describe how you use Newton’s Laws of Motion.

- Give an everyday example for each of Newton’s Laws of Motion? (question narrowed)

- Look at the picture. Label the picture with Newton’s Laws of Motion. Mark where each law is shown or represented. Explain to a partner how each law is represented in the picture. (added context)

- Describe how an automobile uses all three of Newton’s Laws of Motion. (opened up for added complexity)
You Try It!

Differentiating by Process

Leveling Questions

- Choose a topic
- Use the page from your handout to write one question on each level.

page 5 in your handout
Quick Differentiation Ideas
Quick Differentiation Ideas

• Scaffolded Questions

• Wait time

• Partners/Pair Support
**Multiple Intelligences Literature Activities**

**Directions:** Choose at least one open-ended activity from the asterisk chart below.

- Report on one chapter of the book for the TV evening news. Perform your report live, write your report, or tape it.
- Add yourself into the story. What kind of character are you and how do you change the problem in the story? Write a page that shows this new character (you) in the story.
- Write a letter to a talk show host convincing the person to include this book in his or her book club. Be sure to include information about the plot in your letter.
- Design a picture that shows a new setting for a chapter in the book. Explain why this new setting makes the story better and help to resolve the conflict in the story.
- Make a storyboard to show the costumes you would design for each character in the story. Use pieces of fabric, drawings, and pictures cut from magazines.
- Advertise this book with a musical jingle that tells about the setting of the book, its characters, and at least one problem in the story.

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**Differentiating by Product**

*(how the students show what they’ve learn)*
Strategies

Differentiating by Product

Multiple Intelligences

Menu of Options

Interest Centers
Strategies

Differentiating by Product

Multiple Intelligences

1. What is it?
2. Why use it?
3. How do I use it?
Strategies

Differentiating by Product

8 Multiple Intelligences

Verbal/Linguistic

Logical/Mathematical

Visual/Spatial

Bodily/Kinesthetic
8 Multiple Intelligences

- Rhythmic/Musical
- Intrapersonal
- Naturalistic
- Interpersonal
You Try It!

Differentiating by Product

Multiple Intelligences

• Choose a topic

• Choose a multiple intelligence

• Use the grid to brainstorm one activity that appeals to that intelligence

page 6 in your handout
Strategies

Differentiating by Product

Menu of Options

1. What is it?
2. Why use it?
3. How do I use it?

Steps for Using Menu of Options to Differentiate

1. Pick the grade level objective you will be covering.
2. Decide upon the specific skills, concepts, or generalizations that need to be learned.
3. Use the Menu of Options Template (template.doc) to write student project ideas and the corresponding points for each of the projects. Projects that demand more time should be valued with higher points. Projects that take little time should be given lower point values. All projects should center on the objective of the lesson with the specific skills, concepts, or generalizations.
4. Give your students copies of your menu of options. Read over the project choices with students and answer any questions.
5. Give students 10 minutes to talk to their classmates and start getting ideas for their projects.
   - On and Above Grade Level—Help them narrow down their options.
   - Below Grade Level—Have these students work on a few of the projects in small groups.
   - English Language Learners—Meet with these learners to help them pick their projects and to adjust the projects to better meet their needs. It might be helpful to have these students verbally explain their work instead of writing it all down.
6. Distribute copies of the Menu of Options Planning Chart (page 17B) to students. Make an overhead transparency of this page and display it. Explain to students how to fill it out along with ways to manage their time. For homework, have students decide on the projects they will complete and have them turn in their planning charts the following day.
7. Over the next couple of weeks, allow students time in class every few days to work on their projects. Be sure to tell them the day before you are going to give them class time so they can bring their projects from home. Most of the time in class should be spent on background research.
8. At the end of the time period, collect students' projects and evaluate them according to their individual planning charts.

page 7 in your handout
You Try It!

Menu of Options

• Choose one of the menu of options.
• Read through projects.
• How will you earn all 50 points?
Interest Centers

1. What is it?
2. Why use it?
3. How do I use it?
Strategies

Differentiating by Product

Interest Centers

Story Center

Performance Center

Design Center
Strategies

Differentiating by Product

Interest Centers

Reflection Center

Reasoning Center

Test Center
You Try It!

Differentiating by Product

Interest Centers

• Think of a topic you teach.
• Use the template in your handout.
• Create your own Interest Centers.

pages 9-10 in your handout
Sum Up

• Defined differentiation
  - Content
  - Process
  - Product
• Ideas and activities
Drawing!
Come see more Differentiation resources at our booth at #2059

Hillary Wolfe
hwolfe@tcmpub.com
Thank You!
Hillary Wolfe
hwolfe@tcmpub.com

http://www.shelleducation.com