

## *Pasadena ISD Science*

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## **Welcome to the first issue of ScienceE Rocks!**

Welcome to the first issue of ScienceE Rocks, a newsletter produced for our Pasadena ISD science team with input from specialists in all areas including elementary, middle, intermediate and high school, as well as Special Education, Bilingual and ESL. We plan to issue the

newsletter quarterly as part of our desire to effectively communicate and exchange wonderful ideas and strategies developed by the amazing science teachers across the district.

During the last several months, we have worked to define the goals and

approaches for our science program during this academic year. Take a look at just a few of the things we have identified as valuable tools to help our students achieve academic success.

## **Tools to help our students achieve academic success:**

- \*Science vocabulary development
- \*Linking abstract concepts with meaningful activities
- \*Relationship, Rigor and Relevance
- \*Data analysis
- \*Data driven decisions
- \*Scope and sequence
- \*Aligned & Tested curriculum
- \*Differentiated instruction
- \*5 E model
- \*Language objectives
- \*Using Science Inquiry
- \*Cooperative learning
- \*SIOP Model
- \*ESL strategies
- \*Critical Thinking
- \*Scientific literacy
- \*Using technology to enhance instruction



Left to right: Aldo Prado, Darlene McCorvey, John Elmer, Alena Grinstead, Nancy Fredrickson, Denise Ridgway

**Darlene McCorvey** Instructional specialist for K-12 Science in Special Education



**Welcome to a Great Year in Science!**

As Science teachers, we have the awesome opportunity to teach all students from Pasadena's many specialized, instructional programs! This becomes an exciting opportunity to explore the many ways to teach our students the relevancy of Science in their everyday lives.

As our district continues to grow and move farther along in the steps of inclusive education, we should continue to look for rigorous teaching strategies to use in the delivery of Science instruction. As the instructional specialist for K-12 Science in Special Education, a part of my job is to help science teachers understand the purpose and practice

of accommodating and modifying for students in the classroom. I also support teachers in developing and maintaining rigorous and relevant teaching practices and creating successful learning opportunities for all students.

As a member of your campus Science department team, I can work with you in using research-based teaching strategies, in modeling differentiated instruction models of instructing and planning and aligning your curriculum and assessment with the needs of your special and general education students.

I am excited about the opportunity to connect with you through this electronic newsletter!

You may contact me via email at [MMccorvey@pasadenaisd.org](mailto:MMccorvey@pasadenaisd.org) or phone at 713-740-0073. Look for me at your campuses, or feel free to set up an opportunity for me to visit with you or your Science department as you need!

*Sincerely,  
Darlene McCorvey*

**A part of my job is to help science teachers understand the purpose and practice of accommodating and modifying for students in the classroom.**

## Upcoming Events and Staff Development

### In Pasadena ISD

[Eduphoria](#)

**ETP Terrific Tuesdays - 1st-6th SCIENCE**

11/18/2008 at 4:15 PM

**Super Science for Super Teachers - Session 1**

12/9/2008 at 4:30 PM

**ETP Terrific Tuesdays - 1st-6th SCIENCE**

12/16/2008 at 4:15 PM

**Vertical Team Meeting - PreAP Science (grade 6-8)**

11/11/2008 at 4:30 PM

**Intermediate Science Department Head Meeting**

11/10/2008 at 4:30 PM

**Vertical Team Meeting - PreAP Science (grade 6-8)**

11/11/2008 at 4:30 PM

**Secondary Science New Teacher Meeting #3**

11/18/2008 at 4:30 PM

**Secondary Science New Teacher Meeting #4**

12/2/2008 at 4:30 PM

**Language Objectives for Science**

12/11/2008 at 8:30 AM

**Intermediate Science Department Head Meeting**

1/20/2009 at 4:30 PM

**SIOP/ESL Potpourri**

11/10/2008 at 3:00 PM

**Vertical Team Meeting - PreAP/AP Science (grade 9-12)**

11/11/2008 at 3:30 PM

- [American College Testing \(ACT\)](#)
- [American Educational Research Association \(AERA\)](#)
- [Associated Chemistry Teachers of Texas \(ACT\)](#)
- [Association for Supervision and Curriculum Development \(ASCD\)](#)
- [Association of Children's Museums](#)
- [Association of Science-Technology Centers \(ASTC\)](#)
- [Benchmarks for Science Literacy](#)
- [Chem4Kids](#)
- [Chemistry.org/kids](#)
- [College Board \(SAT\)](#)
- [Cool Science for Curious Kids](#)
- [Council for Elementary Science International \(CESI\)](#)
- [Council of Chief State School Officers \(CCSSO\)](#)
- [Discovery Channel Online](#)
- [Early Childhood Education at the Texas Education Agency](#)
- [Education Commission of the States \(ECS\)](#)
- [Environmental Protection Agency \(EPA\)](#)
- [Everyday Classroom Tools](#)
- [Experiments with Magnets](#)
- [For Kids Only: Earth Science Enterprise](#)
- [FrogWeb](#)

## Links to Other Science Resources

<http://www.utdanacenter.org/sciencetoolkit/links/index.php>

- [American Association for the Advancement of Science](#)
- [American Association of Physics Teachers \(AAPT\)](#)
- [American Association of School Administrators \(AASA\)](#)
- [American Chemical Society \(ACS\)](#)

# The Newest Member of the Crew

## Welcome Back!

Science teachers, It has already proven to be a year of challenges and we've only just begun! I hope everyone is successfully recovering from Ike. The hurricane couldn't have made science education any more relevant! I am looking forward to meeting and working with each of you this year. As a newly added science secondary specialist, I am anticipating working closely with intermediate and high school science teachers. My area of focus will be intermediate level science. Alena Grinstead will be focusing more on high school, but we expect to be working

closely together on many things. Our focus this year will be on supporting science teachers. We are carefully analyzing district science TAKS data and will be looking for ways to help address areas of weakness. Eduphoria will offer us the means of collaborating with teachers across the district. It is my belief that we can achieve great success by working together as a team of educators! I am excited about the opportunity to connect with you through this electronic newsletter! You may contact me via email at [DeRidgway@pasadenaisd.org](mailto:DeRidgway@pasadenaisd.org) or phone at 713-740-0866.

I would welcome the opportunity to visit your campus and meet with your department. Please let me know how I can help make this a successful year for you and your students.

Sincerely,

*Denise Ridgway*



Four Education Specialists from Space Center Houston visited Pasadena ISD recently to inform us about the awesome programs they have available for students. In November and December, all Title I schools can visit the Space Center for free (up to 100 free students per school), and for 2009 they are offering a special rate for Pasadena ISD schools. Visit [www.spacecenter.org/SchoolVisitsTitleOne.html](http://www.spacecenter.org/SchoolVisitsTitleOne.html) for more information. Some details of the visits can be customized by grade level and/or TAKS/TEKS objectives. Their specialists would love to be involved with Pasadena ISD and can visit department meetings at the Administration Building, or on your campus. The director of Education is Allison Benjamin, [abejnamin@spacecenter.org](mailto:abejnamin@spacecenter.org) or 281-244-2146.

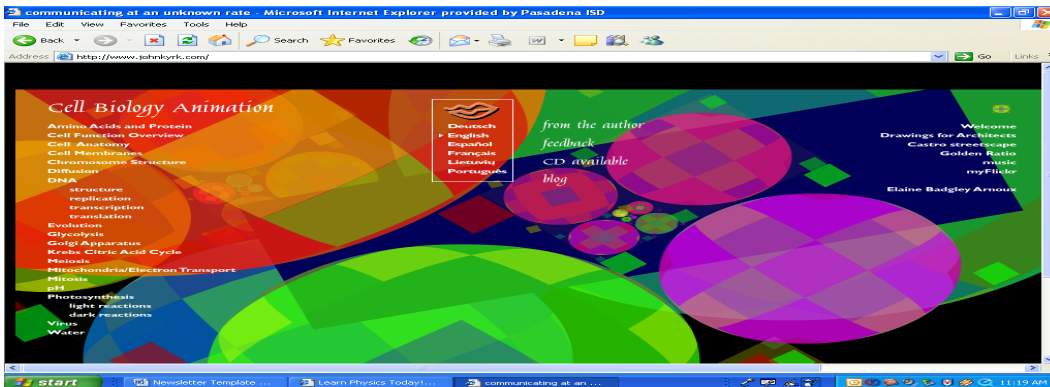


## Electronic resources

### Cell Structure

<http://www.johnkyrk.com/>

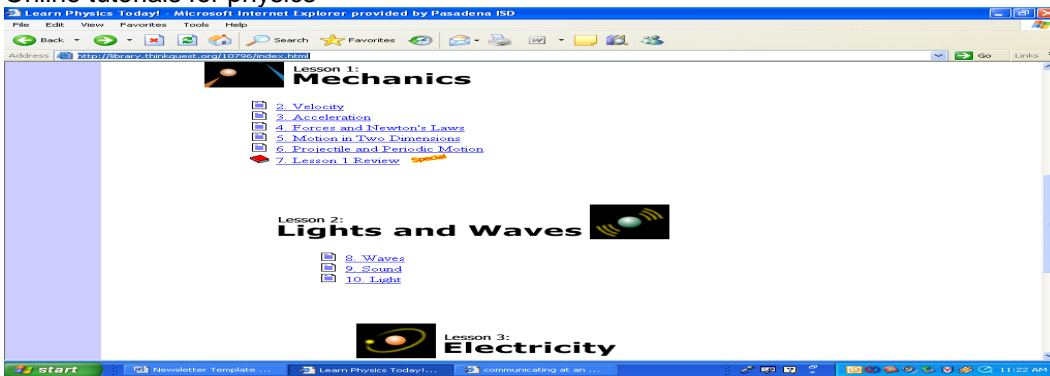
Animations, Interactive activities, different languages.



### Learn Physics Today

<http://library.thinkquest.org/10796/index.html>

### Online tutorials for physics



### Planet Science parents

<http://www.planet-science.com/parents/index.html?page=/parents/home.html>

We want to help **parents** with ideas for activities and experiments that will entertain the whole family - and not feel in the least bit 'schooly'.



## Send us your comments and ideas!

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### What is Differentiated Instruction?

Differentiated instruction, also called differentiation, is a process through which teachers enhance learning by matching student characteristics to instruction and assessment.

Differentiated instruction allows all students to access the same classroom curriculum by providing entry points, learning tasks, and outcomes that are tailored to students' needs (Hall, Strangman, & Meyer, 2003). Differentiated instruction is not a single strategy, but rather an approach to instruction that incorporates a variety of strategies.

Teachers can differentiate content, process, and/or product for students (Tomlinson, 1999). Differentiation of content refers to a change in the material being learned by a student. For example, if the classroom objective is for all students to identify parts of a cell, some students may learn to label five major parts, while others may learn to label more parts and define the function of each part. Differentiation of process refers to the way in which a student accesses material. One student may explore a learning center, while another student collects information from the web. Differentiation of product refers to the way in which a student shows what he or she has learned. For example, to demonstrate

understanding of the food chain, some students may create a three-dimensional diagram, while others create a PowerPoint presentation.

When teachers differentiate, they do so in response to a student's readiness, interest, and/or learning profile. Readiness refers to the skill level and background knowledge of the child. Interest refers to topics that the student may want to explore or that will motivate the student. This can include interests relevant to the content area as well as outside interests of the student. Finally, a student's learning profile includes learning style (i.e., a visual, auditory, tactile, or kinesthetic learner), grouping preferences (i.e., individual, small group, or large group), and environmental preferences (i.e., lots of space or a quiet area to work). A teacher may differentiate based on any one of these factors or any combination of factors (Tomlinson, 1999).

### How Is it Implemented?

Implementation looks different for each student and each assignment. Before beginning instruction, teachers should do three things:

\*Use diagnostic assessments to determine student readiness. These assessments can be formal or informal.

Teachers can give pre-tests, question students about their background knowledge, or use KWL charts (charts that ask students to identify what they already **Know**, what they **Want** to know, and what they have **Learned** about a topic).

\*Determine student interest. This can be done by using interest inventories and/or including students in the planning process. Teachers can ask students to tell them what specific interests they have in a particular topic, and then teachers can try to incorporate these interests into their lessons.

\*Identify student learning styles and environmental preferences. Learning styles can be measured using learning style inventories. Teachers can also get information about student learning styles by asking students how they learn best and by observing student activities. Identifying environmental preferences include determining whether students work best in large or small groups and what environmental factors might contribute to or inhibit student learning.

Teachers incorporate different instructional strategies based on the assessed needs of their students. Throughout a unit of study, teachers should assess students on a regular basis. This assessment can be formal, but is often informal and can include taking anecdotal notes on student progress, examining students' work, and asking the student questions about his or her understanding of the topic. The results of the assessment could then be used to drive further instruction.

## What Does it Look Like for Science?

Science instruction can be differentiated to allow students to explore topics of interest, expand their research skills, and receive instruction on discrete science and inquiry skills. The chart below offers a variety of strategies that can be used.

Strategy	Focus of Differentiation	Definition	Example
Tiered assignments	Readiness	Tiered assignments are designed to instruct students on essential skills that are provided at different levels of complexity, abstractness, and open-endedness. The curricular content and objective(s) are the same, but the process and/or product are varied according to the student's level of readiness.	Some students are provided with direct instruction on the characteristics of living vs. non-living things, and are given guidance in identifying members of both groups. Other students work in teams to identify members of both groups and come up with original examples.
Compacting	Readiness	Compacting is the process of adjusting instruction to account for prior student mastery of learning objectives. Compacting involves a three-step process: (1) assess the student to determine his/her level of knowledge on the material to be studied and determine what he/she still needs to master; (2) create plans for what the student needs to know, and excuse the student from studying what he/she already knows; and (3) create plans for freed-up time to be spent in enriched or accelerated study.	In a science class, students who already know the process of photosynthesis are given a lab assignment in which they must develop and test hypotheses related to the topic, while other students are given more direct instruction on the concept.
Interest Centers or Interest	Readiness Interest	Interest centers (usually used with younger students) and interest groups (usually used	Interest Centers - Centers can focus on specific topics in Earth

Strategy	Focus of Differentiation	Definition	Example
Groups		with older learners) are set up so that learning experiences are directed toward a specific learner interest. Allowing students to choose a topic can be motivating to them.	Science, such as classifying rocks or carbon dating.  Interest Groups - Students can work in small groups to prepare and debate issues surrounding the origin of the universe.
Flexible Grouping*	Readiness Interest Learning Profile	Students work as part of many different groups depending on the task and/or content. Sometimes students are placed in groups based on readiness, other times they are placed based on interest and/or learning profile. Groups can either be assigned by the teacher or chosen by the students. Students can be assigned purposefully to a group or assigned randomly. This strategy allows students to work with a wide variety of peers and keeps them from being labeled as advanced or struggling.	The teacher may assign groups based on student characteristics for a lab in which each group member must take on a specific role. For example, a student who is a strong writer might take notes for the group, while a student who enjoys public speaking might present the group's findings. Students may choose their own groups for another lab in which they will explore the properties of an inanimate object.

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\* More information about grouping strategies can be found in *Strategies to Improve Access to the General Education Curriculum*. Available at [http://www.k8accesscenter.org/training\\_resources/curricular\\_materials.asp](http://www.k8accesscenter.org/training_resources/curricular_materials.asp)

## Science Rocks!

Strategy	Focus of Differentiation	Definition	Example
Learning Contracts	Readiness Learning Profile	Learning contracts begin with an agreement between the teacher and the student. The teacher specifies the necessary skills expected to be learned by the student and the required components of the assignment, while the student identifies methods for completing the tasks. This strategy (1) allows students to work at an appropriate pace; (2) can target learning styles; and (3) helps students work independently, learn planning skills, and eliminate unnecessary skill practice.	A student wants to trace his or her family tree and genetic traits. With the teacher's guidance, the student develops a plan for researching family traits and for learning about genetics. The student decides to make a poster of his or her family tree (with graphics representing genetic traits) to present to the class.
Choice Boards	Readiness Interest Learning Profile	Choice boards are organizers that contain a variety of activities. Students can choose one or several activities to complete as they learn a skill or develop a product. Choice boards can be organized so that students are required to choose options that focus on several different skills.	Students are given a choice board that contains a list of possible activities they can complete to learn about density. The activities include using a water table to explore properties of various objects, reading about density in the textbook, and watching a video with demonstrations centered around density. The activities are based on the following learning styles: visual, auditory, kinesthetic, and tactile. Students must complete two activities from the board and must choose these activities from two different learning styles.

## **References & Resources**

Hall, T., Strangman, N., & Meyer, A. (2003). *Differentiated instruction and implications for UDL implementation*. National Center on Accessing the General Curriculum.

Retrieved July 9, 2004 from:

[http://www.k8accesscenter.org/training\\_resources/udl/diffinstruction.asp](http://www.k8accesscenter.org/training_resources/udl/diffinstruction.asp)

Tomlinson, C.A. (1999). *How to differentiate instruction in mixed-ability classrooms*. Alexandria, VA: ASCD.

<http://www.cast.org/ncac/index.cfm?i=2876> – This site contains an article by Tracy Hall at the National Center for Accessing the General Curriculum. The article discusses differentiation as it applies to the general education classroom.

<http://members.shaw.ca/priscillatheroux/differentiatingstrategies.html> - The Enhancing Learning with Technology site provides explanations for various differentiation strategies.

<http://www.mcps.k12.md.us/curriculum/science/instr/differstrategies.htm> - A Web site that lists instructional strategies and techniques that teachers can use to differentiate in the science classroom.