Engaging and Teaching the Digital Generation of Learners in STEM Subjects

Summary and Background

Founded in 2000, VisualRealization.com is a teacher professional development program that centers on a learning technology model called Digital Imagery as an Instructional Mode for Student Achievement (DIIMSA®). Working closely with educators, DIIMSA was specifically designed to help close the achievement gap. VisualRealization.com sought to combine dynamic digital imagery technology with PBL/PBS models integrated with a comprehensive professional development offering as a powerful and unified solution. DIIMSA was further developed, tested and implemented via pilot projects in the Houston Independent School District and a number of surrounding districts. As outlined in the diagram below, DIIMSA integrates: (1) Conceptual Teaching; (2) Collaborative Learning; and (3) Enabling Technologies in classroom teaching that can be demonstrated as students perform campus-based, field excursion, laboratory and case study experiences.

Today, DIIMSA researchers continue making science and professional development real and relevant. DIIMSA Professional Learning Community (DIIMSA-PLC) experiences are practice-based, ongoing and designed to help DIIMSA participants integrate the methods and strategies learned into the curriculum and align them with student learning goals. DIIMSA participants take collective responsibility for the learning of other participants' students. In addition to meetings and sessions, DIIMSA Participants have access to the DIIMSA Experienced-Based Digital Imagery Content Repository (DIIMSA-EXPERT) 24 hours a day, 365 days a year. DIIMSA-EXPERT is VisualRealization.com's unique digital content repository designed to assist DIIMSA participants as they implement activities, methods, strategies and projects. This online resource uses authentic digital imagery scenes integrated with higher-order questions, vocabulary and concepts correlated for grades 5–8 and 9–12. All DIIMSA-EXPERT content was captured and developed by DIIMSA researchers as part of the ongoing research to make STEM real and relevant.

With DIIMSA, participants: (1) Gain the PBL/PBS pedagogical methods and IT skills needed for successful implementation of activities, methods, strategies, lessons and projects for increased student achievement; and (2) Acquire instructional materials, equipment and curriculum frameworks for implementing activities, methods, strategies and projects designed for the Digital Generation Learner. Ultimately, DIIMSA stimulates a better learning environment by activating multiple senses (sight, sound, touch) during learning, which increases retention and long-term understanding. Visit Us: VisualRealization.com
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Why Visual Realization?

A Visual offers a way to present complex information in an understandable way, which stimulates the senses and enhances understanding and allows learners to see things in the mind’s eye. The mind’s eye (different than stereoscopic vision) is considered the key point of “learned reality” or “imagined thoughts”. The VR Program was developed with this notion entirely in mind. STEM subjects pave the road to foresight in technical disciplines, and the VR Program steers the way. From the atom to the cosmos, the petri dish to the rain forest, and everywhere in between, students and teachers embark on this road of wonderment and discovery.

“The sky is the limit again” is a phrase that captures the very essence of the VR Program. Students and their teachers are revitalized and reenergized. The study of science comes alive, and the boundaries of the science classroom disappear. Students do not simply read about science; they become a part of the scientific process. They do science. Studies show that students tend to remember 10% of what is heard, 50% of what is heard and seen, while they remember 90% of what is heard, seen and done. Teachers and students work side by side, questioning, discovering, sharing and learning.

The students of today will be the explorers of tomorrow, whether in the depths of space or in the depths of the cell. As professionals (astronauts, geneticists, doctors and engineers, etc.), they will shape the future. But in order to do so, they will need the right tools: scientific knowledge, technology and curiosity. As they ask questions and investigate their world, its secrets will be revealed to them, and they will begin to see where the future might take them. Or where they might take it. It is these students, prescient and determined, who will lead the way to tomorrow.

Science education reform publications stress the need for the development of scientific literacy among the general populace and the importance of inquiry-based approaches to teaching problem solving strategies, and content integration. They also advocate that real world contexts be used so students can connect what they are learning to their own environment to promote changes in the instructional interactions between teachers and students. As states struggle to address the mandates for high stakes tests, students learning science has taken on greater significance. Supportive of the current demands of science teaching is the constructivist view of learning. At its core, the constructivist position argues that knowledge is not transmitted directly from one person to another, but rather must be “actively and continuously built by the learner”. Thus, Science leaders are looking for ways to engage students in inquiry, promote active development of understanding by individuals, and encourage collaboration by students in small groups in order to promote communication and groupthink. These are the core focus areas of the VR Program. This program offers educators a way to adhere to reform efforts.

The VR program was created with the help of a pilot project in Houston ISD (1999-2002). This research-based program allows learners to do conceptual modeling of an idea or understanding of a defined problem or scenario and allows learners to see things in the mind’s eye to promote conceptual development and critical thinking. The VR Program provides the foundational knowledge, skills, and experiences students need for future educational achievement and allows students to become more involved in the processes of science. It levels the learning field for students, not by lowering standards or resources, but by raising the bar and bringing all students and teachers up to it.
Example Strategies and Methods used within the DIIMSA Model

DIIMSA “Extreme Vocabulary”, “Vocabulary Definition Connection” and “Answer Blast” Strategies and the 5E Model

The DIIMSA “Extreme Vocabulary” strategy is used to engage learners as teams attempt to connect science vocabulary to unique authentic visual scenes (images and video clips) during a 30 second timeframe. MS-PowerPoint slide transitions are used to facilitate this strategy.

This strategy focuses on allowing learners to be engaged, understand the scene and state a justification from their context of understanding for their randomly selected vocabulary word(s). This strategy creates interest, generates curiosity and allows learners to respond and elaborate based on their interpretation and understanding of the definition of the vocabulary word.

This strategy can also be used to evaluate (Check for Understanding) a learner’s true understanding of the operational definition the vocabulary word as such word is applied across varying scenes and groups during the facilitation of this strategy.

The DIIMSA “Vocabulary Definition Connection” strategy provides a way for learners to be engaged, while confirming the definition that is linked to a given visual scene by using a simple question: Is this definition applicable to this scene? Justify. The basic premise of this strategy allows groups to answer this question using unique scenes and associated definitions randomly for the same term and definition. This random selection forces each group to have different scenes that may or may not apply to the definition. All students are engaged, focused and attentive because they are elaborating and explaining the scene as they attempt to validate the question.

The DIIMSA “Answer Blast” strategy provides a way for learners to be engaged, while answering questions about authentic visual scenes integrated with an open-ended question within a given 60 second timeframe. Authentic Visual Scenes are transitioned across groups as learners use their knowledge to answer associated questions. Each group has to explain and elaborate key aspects of the scene, while trying to develop an appropriate justification on their responses.

Strategies are flexible for implementation and outlined in the knowledge base area of DIIMSA-EXPERT.

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Summary of DIIMSA Professional Development Pathways

**Level III Professional Development**

**Subscriber:** Any user subscribed to the mechanisms enewsletter (free to the general public) or purchaser of a DIIMSA Guideset.

**Member:** Any user with an active DIIMSA-EXPERT subscription. Includes Authoring access in the DIIMSA Learning Community.

**Cohort:** Includes all specifics for Members and yearly professional development sessions. Cohorts are required to attend yearly professional development continuums in Level II Special Topics. Cohorts accumulate hours in Level II Special Topics sessions. Cohorts also have access to be selected as Curriculum Integration Writers and Facilitators.

**Researcher:** Includes all specifics for Cohorts, the implementation of yearly large scale projects and content creators with support from DIIMSA facilitators across grade levels.

**Subscriber**

**Member**

**Pathways**

**Cohort and Researcher**

**DIIMSA Learning Community – Profiling Project Artifacts**

**DIIMSA Guidesets**

**DIIMSA-EXPERT Online Content Collections**

Level I Orientation Professional Development and Instructional Materials (Novice, GT credit applies)

**DIIMSA-EXPERT**

The Experience-Based Digital Imagery Content Repository and Forum

A Resource for STEM Teachers, By VisualRealization.com

**DIIMSA Cohort (Level II Special Topics Professional Development)**

Level II Special Topics Professional Development Yearly Continuums

(Developing and Practicing, GT credit applies, Based on hours of professional development)

**DIIMSA Pals and Researcher (Level II Special Topics Professional Development and Content Creation)**

Level II Research Special Topics Professional Development Yearly Continuums

(Mastery, GT credit applies, Based on hours of professional development and school-based projects)

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### DIIMSA Pathways: Highlights of Level I and II sessions.

Highlights of session specifics for DIIMSA Level I and II sessions. *(Note: All DIIMSA Sessions are GT credit.)*

<table>
<thead>
<tr>
<th>Levels</th>
<th>Typical Session Highlights</th>
<th>Hours</th>
<th>Sub-Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level I</strong></td>
<td>DIIMSA Level I: 4420. Pics-Fair, Extreme Vocabulary, Words, Concepts and Digital Camera Integration.</td>
<td>3</td>
<td>Novice</td>
</tr>
<tr>
<td><strong>Level II Special Topics</strong></td>
<td>DIIMSA Level II: 5520. Vocabulary Video Connection Activity and Worksheet Inclusion.</td>
<td>3 - 6</td>
<td>Developing</td>
</tr>
<tr>
<td><strong>Level II Special Topics</strong></td>
<td>DIIMSA Level II: 5530. Answer Blast Strategy or Question Blast Strategy.</td>
<td>6 - 9</td>
<td>Practicing</td>
</tr>
<tr>
<td><strong>Level II Special Topics</strong></td>
<td>DIIMSA Level II: 5540. Vocabulary Operational Definition.</td>
<td>9 - 12</td>
<td>Mastery</td>
</tr>
<tr>
<td><strong>Level II Special Topics</strong></td>
<td>DIIMSA Level II: 5550. Vocabulary Question Integration Activity Worksheet for Field and Laboratory Experience.</td>
<td>12 - 15</td>
<td></td>
</tr>
<tr>
<td><strong>Level II Special Topics</strong></td>
<td>DIIMSA Level II: 5560. Higher Order Questions with Video Integration.</td>
<td>15 - 18</td>
<td></td>
</tr>
<tr>
<td><strong>Level II Special Topics</strong></td>
<td>DIIMSA Level II: 5620. Innovative Strategies to Create Experiences and Check for Understanding. Customized by Content Focus. (Yearly Continuum)</td>
<td>18 +</td>
<td></td>
</tr>
<tr>
<td><strong>Level II Special Topics</strong></td>
<td>DIIMSA Digital Camera inclusion for large scale projects in field, laboratory, case and campus experiences. Also content creation.</td>
<td>60 +</td>
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</tr>
</tbody>
</table>
## DIIMSA Level I and II: Knowledge and Skills attained across Continuums

<table>
<thead>
<tr>
<th>Levels</th>
<th>Description</th>
<th>Knowledge and Skills Attained by Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>DIIMSA Level I (the starting point) provides the foundation for teachers to gain an understanding of DIIMSA uses, methods and strategies for classroom implementation using the campus-based design. This 3-6 hour session shows teachers “How-To” implement the DIIMSA Model to: Create Experiences and Check for Understanding. Content collections are used in conjunction with strategies and methods to provide a framework for teaching and learning. Specific content, objective or concept focuses can be linked to this session based district or school needs (i.e. Force, Motion and Energy; Earth Science; Living Systems, etc…). Such linkages will determine session timeframe. Course Number: DIIMSA-4420.</td>
<td>✓ How-To integrate Science concepts and processes with authentic visual scenes to create experiences and check for understanding.</td>
</tr>
<tr>
<td></td>
<td>DIIMSA Level II provides a way for participants to be involved in Special Topics sessions for yearly continuums. DIIMSA Tips, Tricks and classroom integration methods are covered in detail, therefore providing ways for teachers to integrate various techniques into their classroom teaching plans. Specific Information Technology (IT) segments will be included to help facilitate teacher artifacts including activities, methods, strategies and projects. Level II sessions are defined based on Special Topics offerings. Such topics include: DIIMSA-5520: Special Topics – DIIMSA Instructional Content using Nature’s Systems to engage the Digital Generation Learner. Sessions are 3 to 6 hours and designed to be a continuum series as participants reach Level II. Level II participants are practicing DIIMSA users and actively involved in lessons and projects. Sub-levels within Level II are based on hours of attendance in Level II sessions.</td>
<td>✓ Understanding of the digital world and the Digital Generation of Learners.</td>
</tr>
<tr>
<td>II*</td>
<td>✓ Understanding DIIMSA Model Methods and Strategies focused on the Campus-Based Design with linkages to all DIIMSA Model designs.</td>
<td>✓ “How-To” access, use and implement DIIMSA-EXPERT content collections.</td>
</tr>
</tbody>
</table>

*Level II Sub-Levels are based on a designated number of hours of professional development hours attained. Sessions are setup for GT credit for teachers in the State of Texas. Level II participants will then be eligible to advance to levels as they complete a designated number of hours of Level II professional development sessions. Such level promotions must be approved by the VR Program manager in conjunction with the district or school science lead.*

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DIIMSA Ongoing Support: User Help, Knowledgebase and Learning Community

Highlights of ongoing support.

<table>
<thead>
<tr>
<th>Support Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone, Email, Learning Community posts and Custom Sessions/Visits</td>
<td>Ongoing support and follow-up support includes: phone, email and custom sessions/visits, if necessary. These options are designed to help participants implement key methods and strategies learned during professional development sessions. Custom sessions/visits are also options for participants and institutions.</td>
</tr>
<tr>
<td>DIIMSA-EXPERT</td>
<td>Access to the DIIMSA Experience-Based Digital Imagery Content Repository and Forum (DIIMSA-EXPERT) site 24 hours a day 365 days a year. DIIMSA-EXPERT is an online science resource that uses authentic digital imagery scenes from real project experiences integrated with applied concept-based questions, vocabulary, concepts and content modules. This resource includes a knowledge base area that contains methods, strategies, tips and reference documents including key Problem-Based Learning (PBL) and Project-Based Study (PBS) instructional documents.</td>
</tr>
<tr>
<td>Real World Connections piCs</td>
<td>Facilitated by DIIMSA researchers, Real World Connections piCs is a way to highlight certain content across the sciences. Doing this provides a way to bring together a range of information about digital imagery that participants will find useful. Real World Connections piCs also includes new content offerings and innovative ways our participants are creating compelling content creations during experiences. Real World Connections piCs is our way to share ideas on DIIMSA-EXPERT content collections with all subscribers.</td>
</tr>
<tr>
<td>Assessment Anthologies</td>
<td>Our DIIMSA-EXPERT research team continues to create, review and approve content from real project experiences by facilitators, researchers and participants in The Visual Realization Program. Assessment Anthologies is our way to highlight certain content collections during critical assessment periods.</td>
</tr>
<tr>
<td>Method and Strategy Focus Weeks</td>
<td>Key weeks are designated for method and strategy integration during the year. Typical methods and strategies range from “Extreme Vocabulary” to “Answer Blast” implementations. During these weeks, DIIMSA researchers provide specific tips and content selections for all.</td>
</tr>
<tr>
<td>DIIMSA Learning Community</td>
<td>The DIIMSA Learning Community is a component of VisualRealization.com’s Unique Communities of Practice. This community allows researchers, subscribers, members, cohorts and participants to profile project artifacts DIIMSA experiences.</td>
</tr>
</tbody>
</table>
DIIMSA Curriculum Integration Framework: Overview
Integrating Activities, Methods, Strategies and Projects into the Science Curriculum

The DIIMSA curriculum integration framework is based on activities, methods, strategies and projects facilitated by select DIIMSA Cohorts and Researchers as Curriculum Integration Writers/Facilitators.

Summary of DIIMSA Activities, Methods, Strategies and Projects

Activities
- Vocabulary Connections Board
- Vocabulary Picture Question Connection
- Vocabulary Video Connection
- The Hypothesis Connection
- The Variables Connection
- Vocabulary Video Question Connection
- Vocabulary Definition Connection
- Video Spella
- Word Argument

Methods
- Brain Warmers using Higher Order Questions
- Digital Camera Integration in STEM
- Knocabulary, a way to Analyze Vocabulary
- DIIMSA SeenView, Social Media Integration

Strategies
- Extreme Vocabulary
- Answer Blast
- Question Blast

Projects
- Making Science Relevant using DIIMSA Pics-Fair
- PBL Driving Question, Letting the Camera Drive the Science
- DIIMSA-EXPERT Project for Content Creators
- Full-scale Field, Laboratory and Case Study PBS/PBL Projects (including Biology-Water Studies; Chemistry-Water Sampling and Analysis; Environmental Science – Soil Studies; and Physics – Bowling Alley)

DIIMSA Teacher Support Resources
- Action Verbs Quick Reference Sheet
- Formulas, Constants and Controls Datasheet
- Science Concepts Summary
- DIIMSA-EXPERT Content Tips, Tricks and Ideas
- Vocabulary Suggestions by Content Area
- Mechanisms Instructional Publication

Activities, methods, strategies and projects are flexible for implementation and outlined in the knowledge base area of DIIMSA-EXPERT.

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DIIMSA SeenView Word Challenge on Twitter

Integrating Social Media and STEM Words

DIIMSA SeenView uses social media to integrate words (concepts, academic vocabulary, content, SAT, action verbs) for STEM by grouping various DIIMSA instructional framework documents--DIIMSA Pics-Fair (DIIMSAPICSFAIR) and DIIMSA Vocabulary Connection Board (DIIMSAVBOARD)--into a cohesive framework for classroom integration for vocabulary and concept enhancement. DIIMSA SeenView focuses on the following social media sites: Twitter, Instagram and Flickr. The popular DIIMSA SeenView Word Challenge on Twitter is based on DIIMSAVBOARD.

DIIMSA Word Challenge – Criteria and Rules

Timeframe and Grade Level
- Every Tuesday (except holidays) starting the last Tuesday in February and ending the first Tuesday in May.
- High School (HS) for Grades 9 to 12 - Tweet posts at 7:00 pm (CST). Student replies close at 7:05 pm (CST).

Delivery via Twitter and Periscope
- Twitter will be used to tweet the DIIMSAVBOARD picture and words to all DIIMSA followers on Twitter
- Tweets will come from the official @DIIMSA Twitter account with the hashtag #DIIMSAChallenge.

Words and DIIMSAVBOARD Support
- Six (6) to eight (8) words will be used each week, and each week a new set of words will be added for HS. Words will be cumulative across months and available in the DIIMSA SeenView resources area: http://visualrealization.com
- DIIMSAVBOARD is also profiled in each DIIMSAVBOARD Guideset with examples to help DIIMSA educators understand ways to support students.

Responses
- Tweets must include the term in all CAPS in the reply. (Example: Rust (oxidation) on transport containers as evidence of a CHEMICAL CHANGE.)
- Tweets are limited to maximum allowed by twitter using free text (No digital imagery allowed in tweets (images, pictures, video, etc…)).
- Students must post replies to the tweets from their Twitter account and each term must be tweeted using a separate tweet reply. No group tweets, meetings or tweets from a parent/guardian’s Twitter account are allowed. The official time posted on the Twitter reply post will be used for judging.
- Students must include the participating DIIMSA approved teacher hashtag in each tweet reply as noted in the eligibility section.

Eligibility and Prizes
- Students must be connected to a DIIMSA educator in order to participate. A DIIMSA educator is any one of the following: (1) Ongoing DIIMSA professional development participant, (2) purchaser of a DIIMSA Guideset, or (3) subscriber to DIIMSA-EXPERT.
- Educators must obtain an approved hashtag (DIIMSA issued) by emailing Karl.Spencer@visualrealization.com to register students they plan to sponsor.
- Students must adhere to all Twitter terms of service. Otherwise students will be disqualified, reported, and blocked from participating.
- DIIMSA Educators with the most student tweets (correct connections) within the given timeframe will win a prize (based on eligibility and judging requirements). Prizes will be awarded as first ($250 gift card), second ($150 gift card) and third ($100 gift card) place.

Getting Started and Contact

DIIMSA facilitators can review the DIIMSAVBOARD guidesets to help facilitate student learning. Guidesets also include templates for student support. DIIMSA facilitators should also review Twitter #DIIMSA and Instagram #DIIMSAVBOARD for sample digital imagery.

Contact for More Information: Karl Spencer@VisualRealization.com
Website: http://visualrealization.com
Connect with Us: Twitter, Instagram and Flickr - @DIIMSA
DIIMSA Experienced-Based Digital Imagery Content Resource (DIIMSA-EXPERT)

As an integral part of DIIMSA Stock, DIIMSA-EXPERT is VisualRealization.com’s unique content resource is designed to assist DIIMSA participants as they implement activities, methods, strategies and projects. Digital imagery collections are real, relevant, authentic and integrated with open-ended questions, concepts and academic vocabulary in a way to create higher order thinking. All DIIMSA-EXPERT content was captured by DIIMSA Researchers as part of the ongoing research to make STEM real and relevant.

Select DIIMSA content is available for corporate, industrial and institution use on DIIMSA Stock (Images and Video Clips.) Learn More: www.diimsa.com

**Teachers use DIIMSA-EXPERT in the following ways:**
- **Classroom Entry (Brain Warmer).** Used as a 5-minute brain warmer to motivate and engage students for unique experiences and perspectives to be extended to the entire class through interactive debate and discussion as a way to create experiences for all.
- **Classroom Exit (Exit Ticket).** Used during classroom exit as a way to “close” the instructional lesson.
- **Class Experience during Instruction.** Used to stimulate student thinking for reinforcing concepts and academic vocabulary across varying content during instructional lessons and projects.
- **Re-Teaching and Reviewing.** Used as a question prompter as students ask new questions and record their observations in a journal for extended research.
- **Tutorials and Assessment.** Used during tutorials to prepare for critical assessment periods.
- **Field Excursion Planning and Preparation.** Used to illustrate concepts and associated vocabulary that will be investigated in the field for a deeper understanding of planned field excursion experiences.

**All DIIMSA content adheres to the following criteria:**

**Reliability and Quality.** Reliable rights managed, secure, virus free digital imagery (certified by site terms); high quality imagery suitable for viewing by K-12 users; and content reviewed and approved by mastery and research experts in the related field.

**Copyrighted, Releases and Reputable Sources.** Content created and copyrighted by researchers and content experts with contacts readily available for support and follow-up questions; and model and property releases on file for all applicable content.

**Real and Meaningful Works.** All digital imagery is substantive and linked to meaningful statements, concepts, questions and/or vocabulary (not empty); Realness to content (not Photoshop edited to make it look nice or masked to confuse or entice); and all links are active.

**Data Integrity.** Users have the ability to: (1) Search on key words and download content; and (2) View (read-only) and not add/change information regarding imagery.

**Support.** Site contains ways to: (1) Contact researchers to validate realness of content; (2) Communicate via phone, email, text message; and (3) Profile content to alert users of key areas of interest.
DIIMSA: Instructional Materials, Kits and Professional Development Pricing

DIIMSA Pricing Summary

**DIIMSA-EXPERT Online Subscription (Yearly)**
- Yearly Single-User Subscription: DMSA-TEACH1  $74.50
- School Subscription: DMSA-SCHOL1  Call
- District Subscription: DMSA-DISTR1  Call

The DIIMSA Experience-Based Digital Imagery Content Repository (DIIMSA-EXPERT) and Forum is designed to assist K to 12 teachers in their far reaching quest to engage learners and create higher order thinking experiences for all.

**Sessions (per participant): Practice-Based Continuum of Connected Experiences**

- **Level I: Introduction (3 Hours): DMSA-PD-LEV-I**  $150.00
- **DIIMSA-EXPERT methods, strategies and suggested uses. This cost excludes DIIMSA-EXPERT access cost.**
- **Level I: Introduction with Digital Camera Classroom Kit (1 Day 6 Hours): DMSA-PD-LEV-I-KIT**  $845.00
- **DIIMSA-EXPERT methods, strategies and suggested uses. Digital Imagery Kit and DIIMSA-EXPERT site access cost included.**
- **Level II: Special Topics Yearly Continuums (3 Hours): DMSA-PD-LEV-II**  $150.00
- **Special Topics sessions as a continuum series of experiences for Level II participants. Special Topics will be offered yearly for Level II participants. This cost excludes the yearly DIIMSA-EXPERT site access cost.**

**DIIMSA Starters and Add-in Bundles**

- **DIIMSA Guidesets: DMSA-PICSFAIR, DMSA-VBOARD**  $14.95 - $29.95
- Facilitators, teachers and administrators highly recommend the popular DIIMSA Guidesets as a way to get started using the DIIMSA instructional framework for vocabulary and concept enhancement. Guidesets are full color and categorized for grade-levels and specific topics. Guidesets are available in both hardcopy paperback (full color pages) or e-book formats for DIIMSA-EXPERT subscribers. For more details visit our online store http://visualrealization.com

- **DIIMSA Teacher Digital Imagery Project Kit – DMSA-TEKIT1**  $695.00
  - Teacher "DIIMSA Projects" Booklet. Seven (7) of each of the following: High Capacity Memory Stick for Digital Camera; and Flash drive. One (1) of each of the following: Digital Camera and DIIMSA camera bag.

- **DIIMSA Teacher Classroom Project Kit – DMSA-TECLSKIT1**  $6,295.00
  - Teacher "How to define Projects" Booklet and Experience-Based Guidset with accompanying CD-ROM and Flash drive.
  - Six (6) of each of the following: Student-Centered CD-ROM with authentic visual scenes; Digital Camera with case; High Capacity Memory Stick for Digital Camera; Flash drive for Computer; Extended Life battery pack.
  - One (1) Digital Camera external memory stick reader and One (1) Power Squid Surge protector.

**Contact:** Karl Spencer, CTO and Program Director
**Email:** Karl.Spencer@VisualRealization.com, **Tel:** 281.898.7244, **Fax:** 713.334.8353
**Visit Us:** VisualRealization.com

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Leadership Team and Contact

Barbara Foots, Education Director. In August 1998 Barbara retired from her position as Manager of Science, K-12, in the Houston Independent School District, Houston, Texas. She received her B.S. in Biology/Chemistry from Prairie View A&M University, and her M.Ed. in Administration and Supervision, as well as her mid-management and supervisory certifications, from the University of Houston. Barbara has taught at the middle school, junior high school, high school, community college, and college levels. Her job titles have included science department chairperson, instructional supervisor, and assistant director. Barbara has authored numerous curriculum documents and has worked on curriculum projects for universities and businesses. She has served on numerous task forces, advisory boards, and professional committees at the local, state, and national levels. She has spoken at schools, universities, professional organizations, and nonprofit organizations. She also served on one of the committees for the development of the National Science Education Standards and the Texas Essential Knowledge and Skills. Since her retirement, she has found a new career in consulting. Her special consulting interest is in program and professional development, program implementation, and student programs and camps. Barbara has received numerous awards for her service and educational expertise.  

Email: Barbara.Foots@Visualrealization.com

Karl Spencer, CTO and Program Director. Karl Spencer is currently CTO and Program Director for all components of The VR program. Since 1999 Karl has been involved in best practices in science and technology for K12 areas, with a focus on PBL and PBS studies using digital imagery technology and authoring techniques. This involvement included a 3-year pilot project involving teachers of science, which extended to student academies, classroom projects, student camps and teacher sessions. From being actively involved in professional development activities for teachers and students to assisting in consulting, design and implementation of projects, Karl is known as a true innovator in Information Technology (IT) and Pedagogy integration. Karl has also assisted in Molecular Biology instruction at the college level and has over 20 years of experience in the areas of IT development, support, training and management spanning across corporate and educational sectors. Karl holds a B.S. in Management Information Systems (MIS) and B.S./M.S. degrees in Biological Sciences from the University of Houston.  

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