

**THEMIS—TIME HISTORY of EVENTS and MACROSCALE INTERACTIONS
during SUBSTORMS**

2005 GEMS SITE LAUNCH LEADERSHIP WORKSHOP

SUBMITTED—November 2005

Cornerstone Evaluation Associates LLC would like to express appreciation to its associates Mr. Robert Goldbach for his assistance with the data analysis and to Ms. Marilyn Spisak for her contributions throughout this evaluation.

TABLE OF CONTENTS

BACKGROUND	1
DEMOGRAPHICS	2
Description of the Participants	2
Motivation to Participate	4
FINDINGS	6
Attendance at Presentations	6
Understanding of Presentations	7
Use of Materials and Ideas	8
Prior Use of GEMS Units and Other Inquiry-Based Curricula	9
Anticipated Use of Materials	11
Ways of Using Materials	12
Comfort with Various Audiences	13
Barriers to Implementation	14
Improving the Workshop	16
Using the Carson City GEMS Site	17

BACKGROUND

The THEMIS (Time History of Events and Macroscale Interactions during Substorms) Mission will determine the onset time and location of magnetic substorms of Earth's space environment, a prerequisite to understanding space weather. The nature of THEMIS science holds the potential for inquiry-based instruction at all grade levels—with most direct application at the high school level.

Recognizing a need to improve education in mathematics, science and technology, the THEMIS team has entered into partnerships with science centers, K-14 educators, professional science organization and mission scientists to implement a comprehensive education and a public outreach (E/PO) program. The five components of the THEMIS E/PO effort are...

- GEONS
- Teacher professional development at conferences
- Launch of GEMS Site
- THEMIS Web site development
- Northern Lights Planetarium show

This evaluation report addresses the third component—the launch of the GEMS Site. This launch represents the collaborative effort of the THEMIS team and the GEMS (Great Explorations in Math and Science) Network in launching the Carson City, NV GEMS Site in June 2005 with its associated leadership workshop.

GEMS is a proven resource for excellence in inquiry-based mathematics and science. Developed at UC Berkeley's Lawrence Hall of Science (LHS), GEMS Teacher Guides are used nationwide by K-8 teachers. To support the increasing number of teachers using GEMS instructional materials, LHS GEMS maintains an international network of 67 sites and centers offering professional development for teachers.

Funding from the NASA THEMIS mission's Education and Public Outreach program supported LHS GEMS and Space Sciences Laboratory (SSL) in establishing the new Carson City GEMS Site. The site launch program created a new source of on-going regional GEMS professional development, with a pool of teacher leaders and a materials kit library. Since the launch, the GEMS Site continues to operate independently, maintaining contact with LHS and using district funds, fees and grants to support its work.

The launch of Carson City, Nevada GEMS site took place in conjunction with a two-day teacher professional development workshop which emphasized space science, earth science and physical science. The THEMIS E/PO team gave two presentations at the workshop including Mapping the Magnetic Field and Living with a Star. The full agenda for the workshop included the following presentations and activities...

DAY 1

- Oobleck: What Do Scientists Do?
- Sifting Through Science OR Mapping the Magnetic Field
- Investigating Artifacts OR Living with a Star

DAY 2

- Build It! Festival
- Terrarium Habitats OR Electric Circuits
- Buzzing a Hive OR Stories in Stone
- Microscopic Explorations

Twice each day teachers were free to select presentations based upon their individual interests and needs, however, the presentations, 'Oobleck: What Do Scientists Do?', 'Build It! Festival' and 'Microscopic Explorations' were presented for the benefit of all participants. Additionally, during the course of the workshop, topics including an overview of the GEMS series/video, the role of GEMS leaders and the Carson City GEMS Site were addressed.

This report summarizes questionnaire data collected from GEMS teachers attending the site launch workshop.

DEMOGRAPHICS

Description of the Participants

A total of 38 teachers, primarily from Nevada, attended the two-day workshop. Five of the teachers are also GEONS (Geomagnetic Event Observation Network by Students) teachers, who had attended a GEONS workshop in Carson City prior to this one. *For a report of the GEONS workshop, contact the THEMIS E/PO team at UC/Berkeley and request THEMIS—Time History of Events and Macroscale Interactions during Substorms—2005 GEONS Teachers Workshop, submitted August 2005.*

While the questionnaire was completed by all of the teachers who attended, not all teachers offered complete demographic information regarding grade levels/subjects they teach, their years of experience or school and student characteristics.

Of the 38 teachers, 37 provided information regarding the grade levels they are teaching. Some of the teachers indicated that they are teaching at more than one level resulting in the percentages totaling more than 100% in Figure 1.

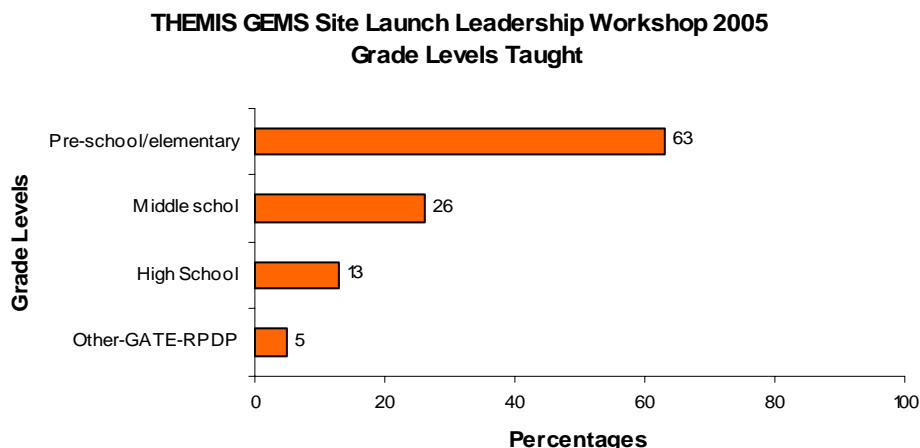


FIGURE 1. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers' indicating the grade levels in which they teach—N=37.

Most of the participants reported that they are teaching at pre-school/elementary level and/or at the middle school level. A total of 63% of the teachers said that they are teaching at the pre-school/elementary level. Another 26% of the teachers said they are teaching at the middle school level. These percentages reflect the fact that the GEMS curriculum focuses on K-8 and that the GEMS site launch in Carson City targeted elementary and middle school teachers—most of whom came from Nevada.

A small number of teachers reported that they are teaching at the high school level. Teachers indicating they are teaching at the high school level totaled 13%. These were predominantly the GEONS teachers.

Two alternative situations were reported. One teacher cited involvement in GATE (Gifted and Talented Education) and another reported working with the Southern Nevada RPDP (Regional Professional Development Program).

These same 37 participants reported that they have been teaching an average of 17 years and are teaching the following subjects/areas...

<u>Subjects</u>	<u>Percentages</u> (N=37)
General elementary course; including Science	46%
Math/Science/Chemistry	41
Administration/Resources/Work Study	11
Reading/Language Arts	5
Exceptionalities	3

When asked about the percentage of students in their schools that represent minorities i.e. non-white, 34 participants said that minorities represent 30% of their students, on average. Twenty-nine participants indicated that females represent an average of 47% of their students.

When asked to provide information regarding the number of students they teach, 31 participants responded that they are teaching an average of 92 students. Of the 38 teachers at the workshop, 26 indicated that there are, on average, 39 teachers in their schools with whom they might share the GEMS materials in some way.

Of the 38 teachers, 33 shared information regarding whether they are teaching in rural, suburban or urban settings. Their responses are summarized in Figure 2.

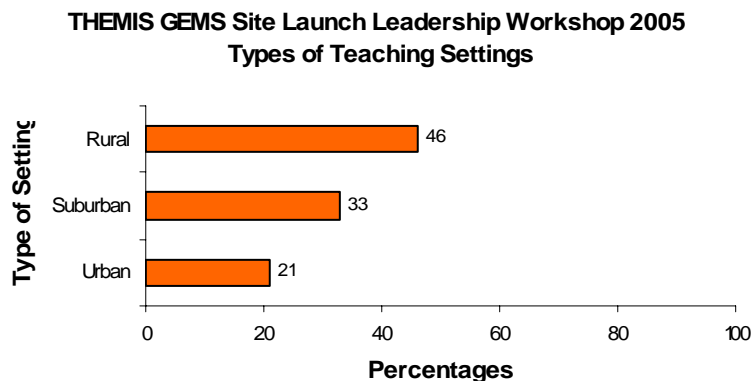


FIGURE 2. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers' indicating types of settings in which they teach—N=33.

Most of the teachers, four-fifths, are teaching in either rural or suburban settings. Teachers teaching in rural settings totaled 46%, while 33% reported teaching in suburban settings.

One in five of the teachers are teaching in urban settings. 21% of the participants reported teaching in urban settings.

Motivation to Participate

The end-of-workshop questionnaire presented an open-ended query asking teachers to discuss what motivated them to participate in the workshop. Table 1 summarizes teachers' comments about their motivations. Multiple responses result in the percentages totaling more than 100%.

THEMIS GEMS SITE LAUNCH LEADERSHIP WORKSHOP 2005 Motivation to Participate	Teachers (N=38)
Familiarity with GEMS —I have several GEMS guides and think they are very well written and explain the concepts very well	37%
Materials—Seeking new or free materials/resources/ideas —The six free handouts; I needed new ideas for teaching science; wanting more science information and experience.	24
Colleague's encouragement—Encouragement from mentor/colleague/district —Judith Dragon's announcement at school; teaching with Gail Bushey kept me informed of GEMS activity; asked by the district to attend; encouragement from another teacher.	18
Workshop convenience—Convenient time, date, location, no cost —I was already in Carson City for a workshop preceding this one; I was in the location; summer date; the fact it's free!	16
Credits—Recertification credit —I needed a credit for my teaching certificate; credit; I needed a recertification credit; in-service credit	16
Inquiry-based learning interest —I'm excited about inquiry-based science curriculum; my interest in hands-on science	16
Love of science —I enjoy science as a topic; interest in science; my love of science	13
Sharing knowledge —desire to share knowledge with other teachers or students—I wanted to teach a GEMS class to teachers	5

TABLE 1. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers indicating various motivations for participating in this workshop—N=38.

Top motivators for workshop attendance were familiarity with GEMS, access to materials and encouragement from colleagues. Familiarity with GEMS was the key motivator for 37% of the teachers to attend the workshop, while 24% of the teachers were drawn to the workshop because they were seeking new materials and ideas. Another 18% of the teachers reported that their colleagues' encouragement played a role.

Convenience was a motivating factor for teachers seeking a no cost, local workshop as well as an easy way to earn recertification credits. Convenience in time and location was the reason given for participation by 16% of the teachers, with an equal number (16%) citing it as an opportunity to earn certification credits.

Learning and the chance to share knowledge caught the attention of some of the teachers. Having an inquiry-based learning interest (16%), a love of science (13%) the desire to share their knowledge (5%) were motivators for workshop participation.

FINDINGS

In addition to demographic and motivational information, the end-of-workshop questionnaire also asked participants for their perceptions of the two-day workshop and the new Carson City GEMS site. Teachers' responses to these questions are presented in the following sections that make up the remainder of this document...

- Attendance at presentations
- Understanding of presentations
- Use of materials and ideas
- Improving the workshop
- Using the Carson City GEMS site

Attendance at Presentations

Workshop presentations offered materials directed to specific grade levels. Presentation names and their appropriate grade levels are summarized below.

	<u>Presentations</u>	<u>Grade Levels</u>
Day 1		
	Oobleck: What do Scientists Do?	4-8
	Sifting Through Science	K-3
	Mapping the Magnetic Field	4-8
	Investigating Artifacts	K-6
	Living with a Star	6-8
Day 2		
	Build It! Festival	K-6
	Terrarium Habitats	K-6
	Electric Circuits	3-6+
	Buzzing a Hive	K-3
	Stories in Stone	4-8
	Microscopic Explorations	4-8

All teachers were expected to attend 'Oobleck: What Do Scientists Do?', 'Build It! Festival' and 'Microscopic Explorations'. Twice each day, teachers were free to select among the other presentations based upon their interests, needs and grade levels.

All of the 38 participants completing the questionnaire indicated which presentations they attended. Figure 3 indicates the number and percentages of the 38 teachers who said they attended each presentation.

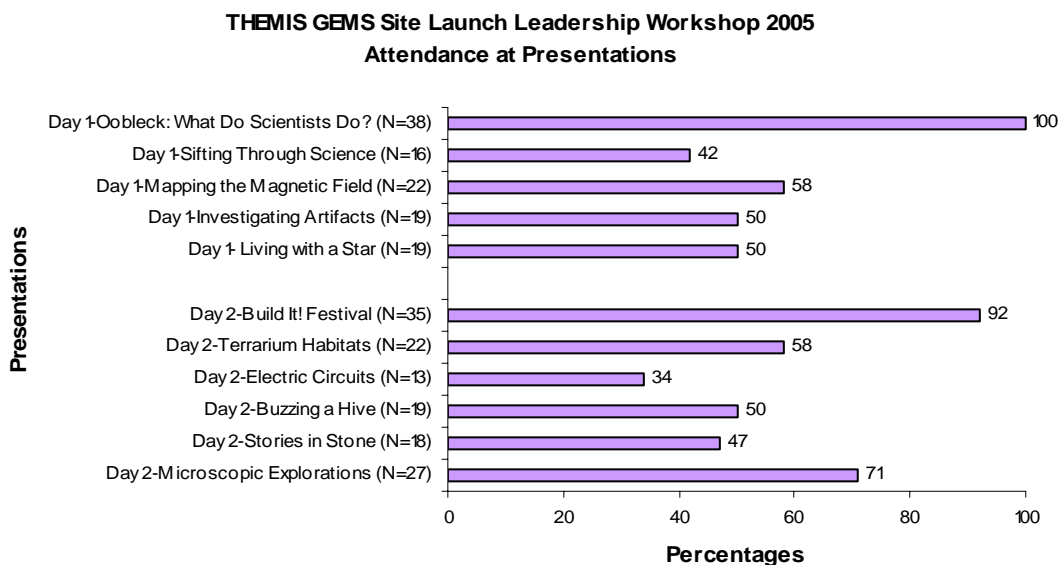


FIGURE 3. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers attending various presentations at the workshop—N=38.

Among the presentations conducted for the benefit of all teachers, ‘Oobleck’ was attended by all. On the first day, ‘Oobleck: What Do Scientists Do?’ was attended by all the teachers (100%). On the second day, ‘Build It! Festival’ was attended by 92% of the teachers and ‘Microscopic Explorations’ by 71%.

On Day 1, ‘Mapping the Magnetic Field’ drew more interest than ‘Sifting Through Science’, while teachers were equally divided for the other break-out session. Of all 38 teachers, 58% of them attended ‘Mapping the Magnetic Field’, while 42% attended ‘Sifting Through Science’ that was offered at the same time. Teachers were equally divided in attending the next group of sessions—‘Investigating Artifacts’ (50%) and ‘Living with a Star’ (50%).

On Day 2, ‘Terrarium Habitats’ drew more interest than ‘Electric Circuits’, while teachers were almost equally divided for the other break-out session. In the first break-out session, 58% of the teachers attended ‘Terrarium Habitats’, 34% attended ‘Electric Circuits’—the least attended session—and 8% did not go to any of the sessions. While exactly half of the 38 teachers went to ‘Buzzing a Hive’, 47% selected ‘Stories in Stone’—and one teacher (3%) attended none of these sessions.

Understanding of Presentations

The end-of-workshop questionnaire asked teachers to use a 4-point scale to rate their understanding of the topics presented in the two-day workshop. Figure 4 indicates the mean ratings given for each presentation as well as the number of teachers (N=) attending each presentation.

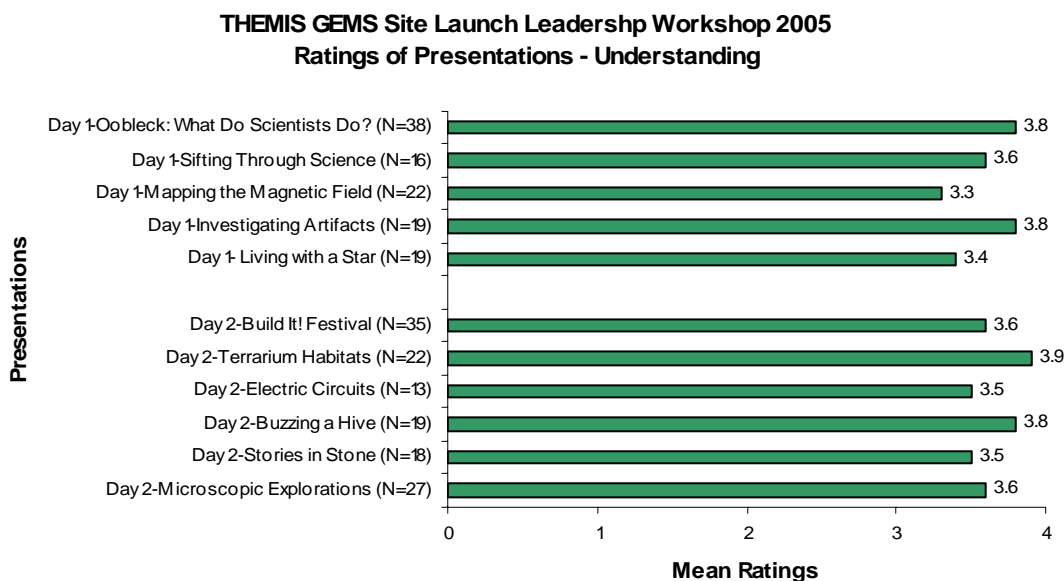


FIGURE 4. THEMIS—GEMS Site Launch Leadership Workshop 2005. Mean ratings of teachers' understanding of presentation topics (4-point scale)—N=38.

Rating Scale Values

- 1=Not clear at all
- 2=Not clear enough
- 3=Clear enough
- 4=Very clear

All topics presented were rated solidly between 'clear enough' and 'very clear'. The mean ratings for all of topics was between 3.3 and 3.9—ranging solidly above the 'clear enough' rating of 3.0 and nearly reaching 4.0, 'very clear'.

Topics directly related to the THEMIS project were rated among the lowest in understanding. Teachers rated THEMIS-related presentations between 3.3 and 3.5, on average—'Mapping the Magnetic Field' 3.3, 'Living with a Star' 3.4 and 'Electric Circuits' 3.5.

For the most part, these presentations were geared for a higher grade level than the others—upper elementary and middle. Since the GEMS workshop was predominantly a group of elementary teachers, they may have found the content of the THEMIS sessions more complex and less applicable to their classrooms than materials intended for pre-school and lower elementary students.

Use of Materials and Ideas

The end-of-workshop questionnaire presented both quantitative, rating scale items and qualitative, open-ended queries related to the use of materials and ideas presented in the workshop. These questions covered the following topics...

- Prior use of GEMS units and other inquiry-based curricula
- Anticipated use of materials
- Ways of using materials
- Comfort with audiences
- Barriers to implementation

Prior Use of GEMS Units and Other Inquiry-Based Curricula

Teachers were asked to estimate the percentage of their science and math teaching time that they use inquiry-based instruction. Thirty-two of the 38 (84%) teachers estimated that they spend almost half (48%) of their time using inquiry-based strategies and techniques. Teachers' responses ranged from 10% to 90% of their time using inquiry-based instruction. The remaining 6 (16%) teachers did not respond to this question.

Of the 38 teachers, 21 (55%) had used GEMS units in their classrooms prior to the workshop, while 17 (45%) of the teachers had never used GEMS materials. The GEMS units used by these 21 teachers are outlined in Table 2. The percentage of teachers using each unit are also indicated—for example, 33% used 'Oobleck: What Do Scientists Do?', 24% used 'Fingerprinting', 19% used 'Bubble-ology', 19% used 'Chemical Reactions', etc. Multiple responses result in the percentages totaling more than 100%.

THEMIS GEMS SITE LAUNCH LEADERSHIP WORKSHOP 2005 GEMS Units Used	Teachers (N=21)
Oobleck: What Do Scientists Do?	33%
Fingerprinting	24
Bubble-ology; Chemical Reactions	19
Crime Lab Chemistry; Discovering Density, Frog Math; Liquid Explorations; Of Cabbages and Chemistry; Stories in Stone	14
Build It! Festival; Earth, Moon and Stars; Investigating Artifacts; Invisible Universe; Liquid Discoveries; River Cutters; Secret Formulas	10
All Upper and Middle Units, Convection; Dry Ice Investigations; Eggs Eggs Everywhere; Group Solutions; Group TOO; Involving Dissolving; Ladybugs; Mystery Festival; Ocean Currents; Penguins and Their Young; Schoolyard Ecology; Terrarium Habitats; Treasure Boxes; Tree Homes	5

TABLE 2. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers indicating GEMS unit(s) used prior to the workshop—N=21.

Four GEMS units had previously been implemented by at least one-fifth of the 'GEMS user' teachers.

Of the 21 teachers using GEMS units, 'Oobleck: What Do Scientists Do?' had been tried by one-third (33%), 'Fingerprinting' by almost one quarter (24%) and 'Bubble-ology' and 'Chemical Reactions' had been implemented by almost one-fifth (19%) each.

All other GEMS units cited were each used by between one and three of the 'GEMS user' teachers.

Three teachers (14%) reported using each of six of the GEMS units, two teachers (10%) reported using each of seven of the GEMS units and one teacher (5%) reported using each of the remaining units listed in the last row of the table.

Of the 38 teachers, 25 (66%) had used inquiry-based curriculum units—other than GEMS—prior to the workshop, while 13 (34%) of the teachers had never used inquiry-based materials. The inquiry-based units used by these 25 teachers are outlined in Table 3. Note that one teacher (4%) used each of the curricular materials mentioned in the last row. Multiple responses result in the percentages totaling more than 100%.

THEMIS GEMS SITE LAUNCH LEADERSHIP WORKSHOP 2005 Other Inquiry-based Curriculum Used	Teachers (N=25)
LHS FOSS (Full Options Science System)	52%
Self-generated labs/activities/science kits	28
AIMS (Activities in Math and Science, Fresno, CA)	20
LHS CEPUP/SEPUP (Science Education for Public Understanding Program)	8
Exploratorium, GAIN, Investigations Math, Math Their Way, Oceans material, Scholastic Science Place, SCIIS (Science Curriculum Instructional Survey, Delta Education; precursor of FOSS), THEMIS	4

TABLE 3. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers indicating other inquiry-based curriculum used prior to the workshop—N=25.

More than half of the ‘inquiry user’ teachers reported implementing FOSS science curriculum. Of the 25 teachers using non-GEMS, inquiry-based materials, 52% of them said they implemented FOSS science curriculum.

At least one-fifth of the ‘inquiry user’ teachers implemented activities from the AIMS Education Foundation and/or generated their own activities and science kits. Of the 25 teachers using non-GEMS, inquiry-based materials, 20% said they have used activities from the AIMS Education Foundation, while another 28% said they have generated their own labs/activities and science kits.

Two of the ‘inquiry user’ teachers reported using the SEPUP curriculum. Of the 25 teachers using non-GEMS, inquiry-based materials, two (8%) reported they have implemented the SEPUP curriculum in their classrooms.

Eight other curricula were mentioned by one ‘inquiry user’ teacher. Of the 25 teachers, eight other kinds of curricular materials—listed in the last row of the table—were used by one (4%) of the teachers.

Anticipated Use of Materials

The end-of-workshop questionnaire asked the GEMS teachers to use a 5-point scale to rate their anticipated use of topics presented in the two-day training session i.e. how likely they are to use the information. Figure 5 indicates the mean ratings given for each presentations as well as the number of teachers (N=) attending each presentation.

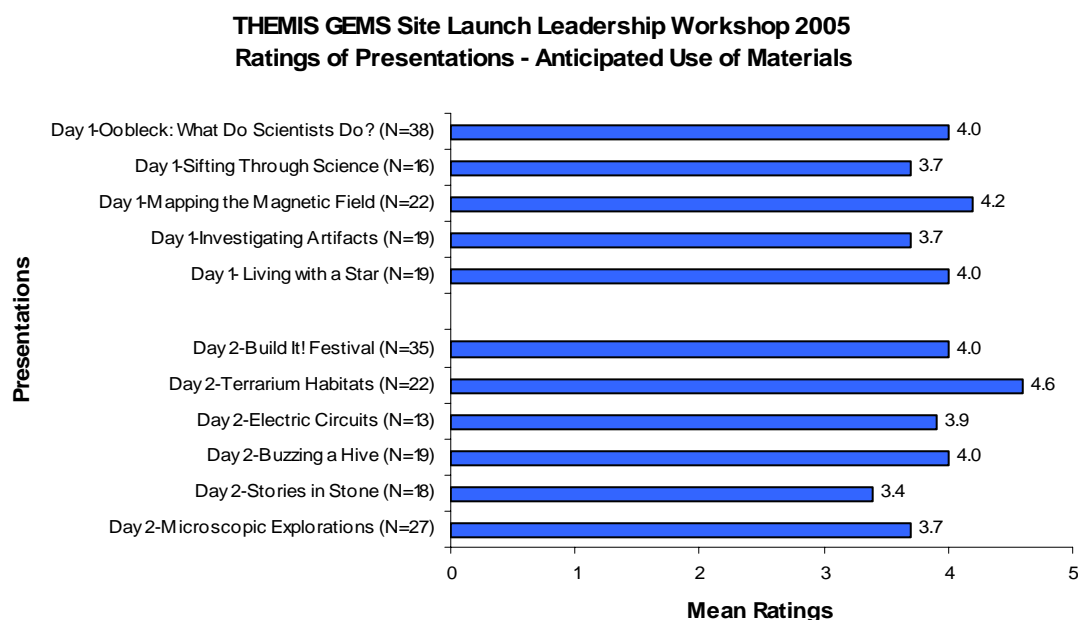


FIGURE 5. THEMIS—GEMS Site Launch Leadership Workshop 2005. Mean ratings of teachers' anticipated use of workshop materials (5-point scale)—N=38.

Rating Scale Values

- 1=Will not use
- 2=Unlikely to use
- 3=Somewhat likely to use
- 4=Very likely to use
- 5=Certain to use

All topics are solidly in the 'somewhat likely to use' to 'very likely to use' range—with 'Terrarium Habitats' approaching the 'certain to use' mark. Mean ratings given by the teachers attending each of the presentations ranged from 3.4 (Stories in Stone) to 4.6 (Terrarium Habitats), all solidly in the range of 'somewhat likely to use' (3.0) and 'certain to use' (5.0).

'Terrarium Habitats' proved to be the topic teachers are most likely to use. On average, the 22 teachers attending 'Terrarium Habitats' indicated that they are nearly 'certain to use' materials—rating the likelihood of use at 4.6. This topic was also the highest rated in understanding at 3.9, as seen in Table 4.

'Stories in Stone' is the least likely of the topics to be used as well as being among the least understood. On average, the 18 teachers attending the 'Stories in Stone' presentation indicated that they are 'somewhat likely to use' the materials—rating the likelihood of use at 3.4. As seen in Table 4, the presentation was among the least understood with a mean rating of 3.5.

Although topics directly related to THEMIS were among the lowest rated in understanding, they are among the highest rated in anticipated use. Among the teachers attending the presentations, 22 teachers gave 'Mapping the Magnetic Field' a mean rating of 4.2 for anticipated use and 19 teachers gave 'Living with a Star' a mean rating of 4.0. These mean ratings cluster around the 'very likely to use' rating of 4.0—and are among some of the highest rating in anticipated use of materials.

As seen in Table 4, however, their understanding of these topics ranged from 3.3 to 3.4 on a 4-point scale—among some of the lowest mean ratings for understanding for GEMS presentations.

Ways of Using Materials

The end-of-workshop questionnaire asked participating teachers to indicate ways in which they anticipated using the materials and ideas presented at the two-day workshop. They were given six multiple choice options for responding. The percentage of teachers selecting each of these options is presented in Figure 6. Some teachers indicated that they will use the materials in more than one way resulting in the percentages totaling more than 100%.

Details about each of these responses were requested. These explanations are included in the highlights that follow Figure 6.

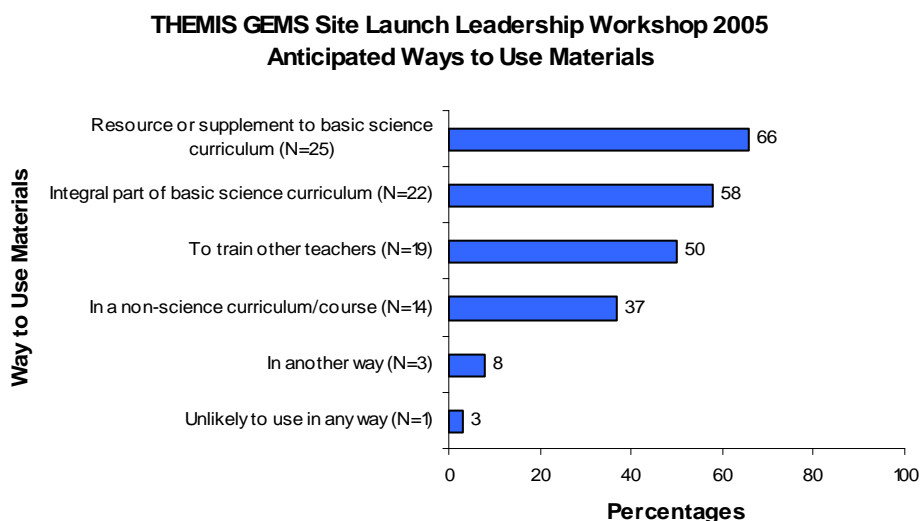


FIGURE 6. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers indicating anticipated ways of using workshop materials.

Multiple choice options

Integral part of basic science curriculum
Resource or supplement to basic science curriculum
In a non-science curriculum/course
To train other teachers
In another way
Unlikely to use in any way

Two-thirds of the teachers indicate they will use the materials as a resource or supplement to a basic science curriculum. Of the 25 teachers indicating that they will use the materials as a resource or supplement to their basic science curriculum, 13 (52%) specified the grade level at which they planned to use these materials—predominantly pre-school, elementary and middle school.

In addition, a total of 14 (56%) of the teachers specified the subject areas in which they planned to use these workshop materials—including science, physical science, general elementary courses and anatomy.

Almost three-fifths of the teachers indicate that they will use the materials as an integral part of the basic science curriculum. Of the 22 teachers indicating that they will use the materials as an integral part of their basic curriculum, 16 (73%) specified the grade level at which they planned to use these materials—predominantly pre-school, elementary and middle school.

In addition, a total of 16 (73%) of the teachers specified the subject areas in which they planned to use these workshop materials—including science, general elementary courses, life science and math/science.

Half of the teachers plan to use the materials to train other teachers. Of the 19 teachers indicating they will most likely use the information to train other teachers, 14 (74%) of these teachers indicated in what situations they would do so—including both formal (the majority mentioning in-services and department meetings) and informal settings.

Less than ten percent of the teachers plan to use the information in another way. Three teachers (8%) said they would use the information in another way. The majority mentioned formal settings such as graduate classes and conferences, while others identified informal settings such as tutoring and after-school clubs.

One teacher does not plan to use the information in any way. One of the teachers (3%) indicated he has no plans to use the information in any way.

Comfort with Various Audiences

The end-of-workshop questionnaires asked teachers to use a 5-point scale to indicate their anticipated comfort level when presenting the workshop topics to various audiences. The questions were phrased by asking if teachers ‘knew’ enough about these topics to comfortably present them to various audiences.

These audiences included students, colleagues in informal settings (chatting in hallways or the teachers’ room) and colleagues in formal settings (in in-services or departmental meetings). They were asked the extent to which they ‘agreed/disagreed’ with these statements. Teachers’ mean responses are graphed in Figure 7.

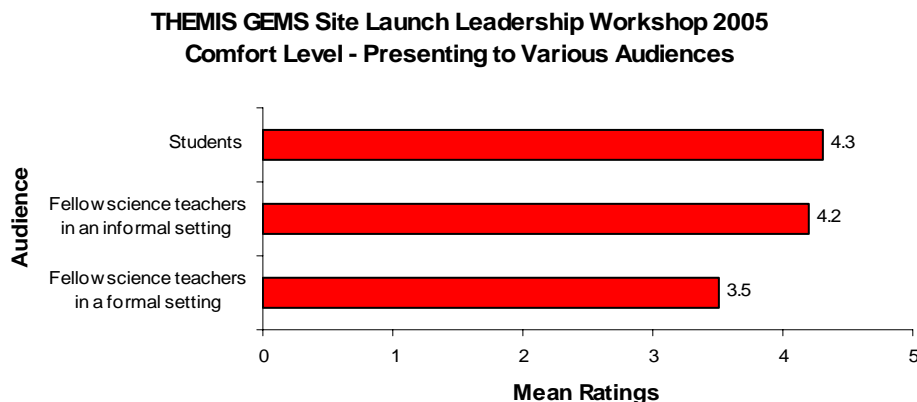


FIGURE 7. THEMIS—GEMS Site Launch Leadership Workshop 2005. Mean ratings of teachers' anticipated comfort levels when presenting workshop topics to various audiences (5-point scale)—N=38.

Rating Scale Values

- 1=Strongly disagree
- 2=Disagree
- 3=Uncertain
- 4=Agree
- 5=Strongly agree

Teachers indicated that they are equally comfortable with presenting the workshop material to students and their colleagues in an informal setting. The teachers' mean rating for presenting material to students was 4.3 and for presenting the material to their fellow teachers in an informal setting was 4.2—both ratings substantially above the 4.0 mark of 'agree'.

Teachers are less comfortable with presenting the workshop material to their colleagues in formal setting. Falling equally between the ratings of 'uncertain' (3.0) and 'agree' (4.0), teachers indicated their comfort level for formally presenting the workshop materials to their colleagues—with a 3.5 mean rating. As is the case for most of us, these teachers are less comfortable presenting to colleagues in a formal setting than an informal one.

Barriers to Implementation

The end-of-workshop questionnaires presented an open-ended query asking teachers to indicate problems or barriers they foresee that might make it difficult for them to implement inquiry-based instruction in their classrooms or to train other teachers in using inquiry-based instructional techniques. Table 4 summarizes the teachers' comments. Multiple responses result in the percentages totaling more than 100%.

THEMIS GEMS SITE LAUNCH LEADERSHIP WORKSHOP 2005 Barriers to Implementation	Teachers (N=33)
Time constraints —Limited time; there is never enough time to prepare the lessons ahead of time after school starts; finding the time; time to make the kit components up front.	42%
Resistance from colleagues/district —District has lack of interest in Science curriculum in grades K-5; lack of desire from other teachers to change; lack of support from district to teach elementary Science	27
Emphasis on other subjects/programs/teaching methods —Emphasis on reading and math; established curriculum driven by state/federal testing; students are not used to inquiry-based instruction.	24
Lack of confidence in self/ability to teach other teachers —I'm out of my comfort zone; insufficient experience—would feel more confident watching a model teacher in my classroom first; I would first need to make sure I had a good background in the subject area before attempting to teach other teachers.	21
Materials issues—Lack of materials/storage space —I do not have all the materials; room size for storage of equipment.	15
None—no barriers —None, already do inquiry-based instruction; no barriers	9

TABLE 4. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers indicating various barriers to implementing inquiry-based instruction in their classrooms or training other teachers in using these techniques—N=33.

Over two-fifths of the teachers mentioned time constraints as a potential barrier. Of the 33 teachers responding to this question, 42% of them cited having limited time to prepare lessons and make kit components in advance as well as having difficulties in finding time to actually implement lessons. The THEMIS team anticipated this barrier in advance by providing 10 kits to the Carson City Site.

Three barriers cited by teachers are associated with their school environments. Of the 33 teachers reporting potential barriers to implementation, 27% cited resistance from colleagues and districts; 24% mentioned their schools' emphasis on other subjects, programs and teaching methods and another 15% reported a lack of materials or storage space.

One-fifth of the teachers expressed concern about their lack of self-confidence. Of the 33 teachers responding, 21% cited their lack of self-confidence and questions about their ability to teach their colleagues as a barrier to using the materials.

A small percentage said that could foresee no barriers. Of the 33 teachers, 9% indicated that they saw no barriers to implementing inquiry-based instruction.

Improving the Workshop

The end-of-workshop questionnaires presented an open-ended query asking teachers to share any ideas or suggestions for improving the workshop. Table 5 summarizes the comments of the 18 teachers who responded to this question. Multiple responses result in the percentages totaling more than 100%.

THEMIS GEMS SITE LAUNCH LEADERSHIP WORKSHOP 2005 Improving the Workshop	Teachers (N=18)
Positive comments/excellent job —Loved the choices given because these were my desired ones; it was great having all books on hand for us to browse; as usual this GEMS presentation was fun and informative; I enjoyed everything that was presented; it was well thought out, minute details attended to, instruction great and terrific to be involved in; very nice job!	56%
Modify handling of presentation/materials—less in depth/cover more —I recommend letting teachers get a 'taste' of the activity rather than doing each activity in depth as if we're students; I'd rather get the overview of more kits than a couple in-depth; fill the first day with more presentations of the guides; have a drawing for a kit (free); have some books on hand for purchase without shipping and handling because it would be a nice benefit and an incentive to purchase now.	22
Provide more time—to explore materials/activities; to interface with others —Time is the enemy, there wasn't enough of it; time to do more activities; more time to interface with each other and the materials on the back table.	17
Comfort issues —Softer seats (chairs vs. benches); save cookies from lunch and put out for a snack during afternoon break	11
Provide tools/techniques for presentations —Give presenters tools for getting a roomful of teachers' attention.	6

TABLE 5. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers providing various suggestions for improving workshop—N=18.

More than half of the teachers praised the workshop just as it was and offered no suggestions. Of the 18 teachers offering comments, 56% provided positive comments and praised the workshop as a 'very nice job'.

Teachers provided specific suggestions for improving the workshop—offering time management strategies, ideas for modifying presentations and techniques for focusing a large group. 22% of the 18 teachers responding to this question offered specific suggestions for covering more material in less depth, 17% indicated that they would like more time to explore materials and activities as well as to interact with colleagues and finally, 6% said presenters should be given tools for getting the attention of the audience.

A small number of teachers cited comfort issues that would make the workshop more enjoyable. Of the 33 teachers, 11% stated that softer seats would be appreciated and offered a suggestion for an afternoon snack.

Using the Carson City GEMS Site

The end-of-workshop questionnaires presented an open-ended query asking participating teachers to indicate how they anticipate that the new Carson City GEMS site will be able to assist them in feeling more knowledgeable about the workshop topics and more comfortable in presenting them to their students or colleagues. Table 6 summarizes the comments of the 32 teachers who responded to this question. Multiple responses result in the percentages totaling more than 100%.

THEMIS GEMS SITE LAUNCH LEADERSHIP WORKSHOP 2005 Anticipated Assistance from Carson City GEMS Site	Teachers (N=32)
Training/resource person available—get questions answered— Contacts, more leadership trainings; training; Gail teaches two doors down, borrow and steal; It will be easy to get questions answered	50%
Materials/resources availability— GEMS site will be a great resource for finding information, borrowing kits, etc; borrowing materials for workshop; it will be easier to check out a guide I don't have; nice to know kits are available to present to staff and allow them to experience the activities.	47
Facilitating connections with colleagues/support— Teacher support and dialogue; moral support; contact/network; love to collaborate with Gail Bushey; Be close to communicate with other teachers doing the same thing!; support with resources and awareness.	28
Uncertain— I am not certain at this point; I will more likely use a GEMS center closer to me.	6
Proximity— It's close!	3

TABLE 6. THEMIS—GEMS Site Launch Leadership Workshop 2005. Percentages of teachers indicating various ways they anticipate the Carson City GEMS site will assist them—N=32.

The availability of training, resource people and materials are the top ways in which the GEMS site will assist teachers. Of the 32 teachers who responded, 50% of them mentioned that the key advantage of a GEMS site was having training and resource people nearby. Another 47% of the teachers said that having the materials available is the plus of a Nevada GEMS site.

More than a quarter of the teachers anticipate that the Carson City GEMS site will facilitate their connections with colleagues. Of the 32 teachers responding, 28% said that they anticipate they site will provide a network of colleagues available for dialogue and support.

While one teacher appreciates the proximity of the Carson City GEMS site, two of the teachers are uncertain how it will serve them. One teacher (3%) cited the site's proximity, while two others (6%) indicated they were not certain how the Carson City GEMS site could assist them.