2006

Teaching Middle School Students Science Vocabulary Using Alternative Methods

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Abstract
Students entering middle school are exposed to and expected to learn a tremendous amount of vocabulary particularly in the science field. During the past fifty years, direct instruction involving the use of dictionaries and glossaries has been one of the preferred methods in achieving this goal. This research paper investigated the effectiveness of using alternative methods for science vocabulary instruction involving two urban middle school classrooms. Results of the research indicate that there was not a single method used by itself or with another method that showed a notable improvement. However, there appears to be a slight improvement when combining the methods of familiar association, hands on activities or keyword mnemonics with other methods.

Document Type
Thesis

Degree Name
MS in Mathematics, Science, and Technology Education

This thesis is available at Fisher Digital Publications: http://fisherpub.sjfc.edu/mathcs_etd_masters/121
Teaching Middle School Students Science Vocabulary Using Alternative Methods

Phillip Gauldin

St. John Fisher College
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Abstract

Students entering middle school are exposed to and expected to learn a tremendous amount of vocabulary particularly in the science field. During the past fifty years, direct instruction involving the use of dictionaries and glossaries has been one of the preferred methods in achieving this goal. This research paper investigated the effectiveness of ten alternative methods for science vocabulary instruction involving two urban middle school classrooms. Results of the research indicate that there was not a single method used by itself or with another method that showed a notable improvement. However, there appears to be a slight improvement when combining the methods of familiar association, hands on activities or keyword mnemonics with other methods.
Teaching Middle School Students Vocabulary Using alternative Methods

Students entering middle school science classes are flooded with an overwhelming amount of new vocabulary words which are required to be mastered. Much of the vocabulary derives from the curriculum guides of school districts and New York State Learning Standards. As a middle school science teacher with experience in general and special education classrooms, I have observed that the teaching of new science vocabulary can become tiresome for many of the students as well as the instructors. Daily lessons sometimes can incorporate up to eight new vocabulary words with minimal time to learn their meanings and complicated relationships between each other and context within the curricular unit being studied. Vocabulary instruction often becomes nothing more than the rote memorization of a word list from assorted text books, dictionaries, and glossaries which withers away with time. I have found myself pairing down vocabulary to “important concepts” only in an effort to free up time and move through the curriculum. I reflect upon my own teaching methods while intently absorbing the alternative instruction ways of colleagues in an effort to gain insight into effectively teaching vocabulary in a meaningful way that would promote interest and deep understanding. How can I enrich my vocabulary instruction with methods and activities which will allow my students to become active and engaged participants?

The following research investigated a variety of methods to teach science vocabulary to middle school students. Many of the methods have been developed over the years as outlined in a literature review. Ten methods were chosen to be used as stand alone or in conjunction with each other for implementation on a sample of middle school science students while being applied throughout the school curriculum. Each method(s)
was assessed and assimilated into an information matrix containing all complete data which was analyzed for specific method effectiveness.
Literature Review

What constitutes effective vocabulary instruction which allows middle school science students to understand and take ownership of unfamiliar words? Students entering middle school science classes are flooded with an overwhelming amount of new vocabulary words which must be mastered. The question arising in this literature review focuses on the research pertaining to alternative methods and instructional strategies which will enable students to understand and effectively use new science vocabulary words on an adequate level of comprehension.

According to Len (1999), teachers have spent an extremely small amount of time on vocabulary instruction in the classroom. In addition to this, vocabulary instruction has been often taught in isolation without the consideration of the student’s personal background or previous knowledge engaged.

Many students who have later become avid readers originally struggle with science and content area reading. Students have cited two main difficulties that consistently create roadblocks to content reading success. These roadblocks have been boring texts and too many difficult words according to Allen (2002). Allen states that verbal association and explicit instruction for specific words are two areas that could possibly help overcome the mentioned roadblocks. Harmon (1998) states that “word learning is a complex task that occurs in many settings” (p.158). Instructing students to look up definitions in an index or dictionary is meaningless. Such methods, as stated by Nagy (1988), do not activate background knowledge nor does it engage the student. Definitional approaches to vocabulary learning have been often confusing and often grossly inaccurate. When students were instructed to copy definitions of unfamiliar
words, the idea prevailed that students have learned the words if they have copied the definitions (Brabbam & Villaume, 2002).

Active student participation, extensive reading of authentic science literature and the teaching of metacognitive strategies has constituted meaningful vocabulary instruction according to Foil and Alber (2002), Harmon (2002), Brabbam & Villaume (2002), Nagy (1998), and Blachowicz and Lee (1991). Instruction that promoted active student participation has allowed students to take ownership of the vocabulary learned (Blachowicz & Lee, 1991). Making connections and associations to words which students were already familiar with allowed students to rely on personal experience, with which word learning became meaningful to them.

The connection between unfamiliar words and familiar words occurred in a variety of learning situations (Foil & Alber, 2002). Foil and Alber discussed a method that may help students understand difficult terms. Students were videotaped everyday in situations that illustrated examples of the learning words. This activity could be shown to be a springboard to discussions revolving around what each student perceives in the videotape. In addition, the use of video technology also showed students made notable gains pertaining to learning new word meanings.

The teaching of metacognitive strategies pertaining to new word learning has been an important facet of vocabulary instruction. Research, as stated by Harmon (2002), says middle school students that have a limited vocabulary base also struggle with reading comprehension. Students need direct and explicit instruction in acquiring unfamiliar vocabulary words in content areas. Nagy (1998) also has supported the need
for direct instruction stating that students need to practice learning strategies that increase vocabulary and promote comprehension.

Wide reading in content areas such as science has provided students with vast opportunities to acquire vocabulary. Wide reading consists of allowing students to read from a variety of sources including magazines, trade books, newspaper articles and novels. Many of these sources are authentic which provide personal engagement for the individual reader. Allowing for adequate wide reading time in the classroom has created opportunities for incidental learning of new words (Brabbam & Villaume, 2002; Blackowicz & Lee, 1991; Harmon. 1998). However, reading unfamiliar words in context alone has not simply increased student’s vocabulary. In addition, assigning words from a specific selection of a science text has not allowed student ownership of the words.

Another interesting science literature strategy that has increased vocabulary is referred to as paired text reading set forth in Moore (2002). Moore used two texts that were conceptually related in some way such as theme or topic. Students read both sets of text while comparing similar passages and structures. Moore described this technique as a form of literature inquiry.

One procedure discussed by Rosenblaug (2001), was the use of a Word Map. Students were instructed to find interesting words during their independent or assigned readings. With the uses of a graphic organizer, students were instructed to write the unfamiliar word and the page number it was found, in the center of the word map. Contextual use of the word was established first followed by the use of a dictionary meaning. When completed, this style of graphic organizer eventually utilized a dictionary definition, the word used in context, analysis of the word, synonyms,
antonyms and background knowledge (Rosenbaum, 2001). In addition, the student was allowed to write another sentence that was generated from personal experience. Much research supported the need for unfamiliar words to be used repetitively in efforts to gain understanding of the words. It was found that repetitive word usage came from a variety of sources from within a classroom inclusive of wide reading, peer interaction and teacher initiation. Effective vocabulary instruction was needed to incorporate the use of words in familiar settings, using the words repetitively, and instruction which actively engaged the students (Nagy, 1998). The word map (Rosenbaum, 2001) was aimed at having the students use the map on a daily basis. It also utilized dictionaries as a part of the new word learning process which was a component of effective word learning and not a means to itself. To promote deeper learning and understanding of new words, students needed to use the unfamiliar words in a way that the words became familiar. Another similar useful map structure has been the Predict-O-Gram as discussed by Allen (2002). With Predict-O-Gram, students were given a list of content words specific to the topic of study, as they attempted to determine how the words might be used within the text. Students thereby connected their background knowledge with content vocabulary to establish connections for the topic being studied.

Dictionaries, glossaries, and thesauruses have been useful tools when used in conjunction with other strategies that have allowed effective understanding of unfamiliar words. Lem (1999) discussed the effects of research conducted on 88 sixth grade students: Does having direct access to a thesaurus affect the quality of composition writing. Forty four students (Group 1) were allowed to use a thesaurus with the addition of vocabulary activities implemented in the classroom. Group 2 did not have access to a
thesaurus and additional activities were not used in the classroom. The experiment lasted approximately 8 months with notable improvements in composition writing from group 1. Group 2 did not show any notable improvements in writing. However, the sample of students in the study was not considered to be large enough to provide adequate results. A question still remains whether the activities had a major influence on the outcome of the data concerning Group 1.

New word assimilation has always been a gradual learning process. It is a collection of multiple strategies that students encounter, enabling them to develop a deeper understanding of the new word. Dictionaries, glossaries, seeing words in context, and incidental learning, when used in isolation, are not effective methods. However, according to Nagy (1988), these strategies are all important when used in appropriate settings.

Blachowicz & Lee (1991) and Rosenbaum (2001) stated that vocabulary instruction utilized a variety of organizational tools, pre-reading and post-reading activities, and encountering of the word in context. Dictionary and contextual approaches have left the unfamiliar word hanging in isolation creating a grey area of understanding. They have omitted a vital component of effective vocabulary instruction being the student’s personal connections (Stahl & Kapinus, 1991).

Possible sentences, (Stahl & Kapinus, 1991), was an approach to teaching vocabulary which used textbooks. This strategy incorporated text definitions, contextual application and the activation of students’ background knowledge. First, six to eight words that students are unfamiliar with were written on a chart. In addition, four to six words that students do know were also listed on the chart. A short definition
accompanied each word that incorporated as much student input as possible. Students were encouraged to use their background knowledge in crafting the initial definitions. Students were then instructed to think about how these words would be used in the reading by creating a possible sentence using at least two words from the list of words on the chart. This allowed students to see the relationship between two words and let students take ownership in the definitions, according to Stahl and Kapinus (1991). The students were directed to read a selection of text. Following the reading, the sentences were discussed, based on the reading, if the statement is true or false. If the statement was true, the sentence was left alone. If the statement was deemed false, it was then modified to make it true. Students became active participants in new vocabulary learning (Stahl & Kapinus, 1991). Possible Sentences engaged students in pre-reading and post-reading participation.

Teaching specific vocabulary learning strategies, like Possible Sentences (Stahl & Kapinus, 1991) gave students the necessary skills to acquire and use new words effectively. Brabham and Villaume (2002), Nagy (1988), and Harmon (1998, 2002) agreed that systematic and direct instruction pertaining to new vocabulary acquisition was necessary for effective word learning. Harmon (2002) discussed the need for students to develop metacognitive awareness when encountering new words in a text selection. When students were taught to skills to use when encountering new words while reading, they were able to think about why they needed to learn the unfamiliar word. According to Harmon (1998), students needed to be able to see associations between words and know how to use specific word comprehension strategies. Often,
students were taught skills that enabled them to learn new words. Instead of using the strategies, they skipped the unfamiliar or unknown words. (Harmon, 2002).

There has been a fair amount of favorable research in the area of mnemonics in relation to science and other content vocabulary areas. Keyword mnemonics has been at the forefront of the research. King-Sears (1992) incorporated and tested two instructional keyword mnemonic procedures to teach science vocabulary to middle school students with mild disabilities. Favorable results for both techniques were obtained concluding the research. King-Sears (1992) and Scruggs & Mastropieri (1992) agreed that keyword mnemonic strategies could be successful when applied to a wide range of student populations including those with mild disabilities as well as gifted children.

In addition to using word association, mnemonics and word identification strategies, Harmon (2002) discussed the usefulness of peer dialogue as a necessary tool for effective vocabulary learning. The dialogue was conducted to explore and use independent word learning strategies during independent reading. Jaus (1990) compared the performance of three groups of middle school science students with varying amounts of dialogue. The group of students that outperformed the other two groups in learned science vocabulary had participated in the greatest amount of peer discussions during instruction. Stahl and Kapinis (1991) also supported the use of dialogue by stating the need for students to engage and participate in active learning by sharing information and interacting with peers.

When students were allowed the opportunity to communicate and interact with peers, students expanded on their word learning strategies and knowledge. Foil and Alber (2002) discussed several aesthetic activities for expanding on unfamiliar
the concept of density during an explanation phase based upon their experiences. Applying the density concept and experiences to authentic and student related interests was the final phase. Hermann (1998) investigated using materials such as beads and strings for atom modeling in learning through a program. Realia was the use of real objects and materials to make learning more explicit to learners. This was extremely beneficial to science students where there tended to be a massive introduction of vocabulary into the curriculum. The use of realia in science lessons allowed teachers to reach the many different modalities of student learning such as kinesthetic or visual. Lloyd & Contreras (1985), Robertson (1997), and Hermann (1998) all agreed upon using hands on activities with materials that created prior knowledge to better understand concepts and vocabulary.

The research that pertained to the instruction of students in learning new science vocabulary was extensive and varied clearly supporting that there was no best method. New word learning was complex and the classroom environment supported new word development. Brabham and Villaume (2002) and Rosenbaum (2001) stated the importance of providing an environment that was language rich. A science classroom was meant to have many pictures, objects, devices, animals and materials demonstrating vocabulary. Science vocabulary learning also needed to be integrated into instruction daily. According to Johnson and Rosenbaum (1998), Harmon (2002), and Nagy (1998), the learning of unfamiliar words required to be directly taught, providing skills that students needed to be able to understand words. Most important, all of the research supported teachers which provided opportunities for students to be active participants
during science and content vocabulary instruction that allowed them to take ownership of their learning.
Methodology

The following research investigated a variety of methods to teach science vocabulary to middle school students. The sample middle school was located in an urban school district of a medium sized city in the state of New York. Two seventh grade science classrooms were chosen from the sample middle school that operated on a block schedule basis where each science class met every other day for a period of eighty five minutes. The classes designated 7C and 7E were non-inclusion classes containing twenty-five and twenty four students respectively.

Ten specific methods were chosen to be used as stand alone or in conjunction with each other for implementation in the two classes. The specific method(s) were used with one to three vocabulary words for the particular lesson on a specific day. The method was assessed within the following week using multiple choice, short answer, or performance tasks. A summary of each specific method has been shown below with an abbreviation for future reference. A detail of how each method was used with each specific word was logged in the daily worksheets. The daily worksheets are in Appendix B.
<table>
<thead>
<tr>
<th>Method</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide Reading</td>
<td>WR</td>
<td>a variety of literature sources were read prior to and in conjunction with the specific lesson</td>
</tr>
<tr>
<td>Word Map A</td>
<td>WMA</td>
<td>a word map organizer (A) was used while introducing the vocabulary</td>
</tr>
<tr>
<td>Word Map A</td>
<td>WMB</td>
<td>a word map organizer (B) referred to as vocab trap was used while introducing the vocabulary</td>
</tr>
<tr>
<td>Dictionary-</td>
<td></td>
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</tr>
<tr>
<td>Glossary-pictures</td>
<td>DGP</td>
<td>the textbook glossary was used along with pictures and a dictionary to introduce the vocabulary</td>
</tr>
<tr>
<td>Keyword Mnemonics</td>
<td>KM</td>
<td>specific letters were focused upon to develop a mnemonic to aid the student while introducing the vocabulary-specific to the lesson and word</td>
</tr>
<tr>
<td>Peer Dialogue</td>
<td>PD</td>
<td>students were allowed to discuss the word and related meanings in a group setting while introducing the vocabulary.</td>
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<tr>
<td>Activity</td>
<td>Code</td>
<td>Description</td>
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<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>Hands on Activity (HOA)</td>
<td></td>
<td>A hands on related activity was used to introduce the vocabulary</td>
</tr>
<tr>
<td>Paired Reading (PR)</td>
<td></td>
<td>Students were put into groups of two and they jointly alternated reading the passage to each other while discussing unfamiliar words and their context.</td>
</tr>
<tr>
<td>Familiar Association (FA)</td>
<td></td>
<td>A related familiar item or story was associated with the vocabulary word during the introduction.</td>
</tr>
<tr>
<td>Paired Text (PT)</td>
<td></td>
<td>Students read two similar articles or texts on the same subject while introducing the vocabulary.</td>
</tr>
</tbody>
</table>

A ratio was made for the number of students with correct assessments divided by the total number of students taking the assessments. Due to attendance variations, often the number of students being assessed did not match the classroom enrollment numbers fore mentioned. A database matrix was developed from the assessment data for numerical analysis. Along with the developed matrix, short observation notes were taken to embellish the factual numerical data. The numerical analysis and observation notes provided the basis for the effectiveness of the particular method(s).
Results

Results of this research have been based upon a numerical analysis of the assessment and additional observation notes taken during the lesson and assessment. After each lesson, an assessment was performed with each student on the vocabulary that was the target. A percentage of correct answers by the students served as the basis for the numerical analysis. All numerical percentages for each method used were tallied into a matrix that shows a percentage for using the particular method by itself or in conjunction with another method. Please refer to Appendix A for the actual matrix. The observation notes taken during the lesson and assessments were focused upon attention, engagement, general interest, and responsiveness of the students. The observation notes can be viewed on each daily sheet record in Appendix B.

WR was observed once in conjunction with DGP. This combined method performed in the middle of the overall methods for effectiveness. Observations during this method showed an abnormally large block of time being used by the students who were mostly engaged by the reading material.

Both of the word maps (WMA, WMB) also performed in the middle of the overall methods for effectiveness. The students were observed to be generally interested in filling in the information on the word maps but lost focus and struggled when having to write sentences using the new vocabulary word which occurred on both of the word maps.

The DGP method was a very familiar method for the students as they knew exactly how to execute it from previous experience. The students were observed to show a satisfaction and readiness to move forward upon completion of the task. This
satisfaction did not prove to correlate to any marked difference in performance than any other methods. However, on the occasions that DGP were used in conjunction with FA, an above average percentage of 85% was obtained.

KM was shown to have a slightly better record than all other methods when used in conjunction with FA or HOA. Students did not seem very interested in using KM but seemed to remember the particulars of the specific mnemonic when applied.

PD was very difficult to implement and manage in the classroom. Students often ventured off task. The results for this method were slightly below the average of other methods.

HOA proved to be the most engaging for the students as they maintained interest in manipulating or watching an activity. Response of the students to HOA showed them to obtaining some previous knowledge which they later applied during discussions within the classroom. Overall effectiveness of this method was slightly higher or at an equivalent level with most of the methods when used alone or with another method.

Observation notes for PR showed this method to be very difficult to manage despite the interest and engagement of the students while working with a friend or partner. The results for this method when used alone or with another method were at an equivalent level or slightly lower than other methods.

FA proved to be very beneficial when used in conjunction with another method as the percentages were slightly higher than other combinations of methods. The students were seen to be very responsive to the use of familiar objects or circumstances that they could relate to with their own personal previous knowledge. Many discussions with the students evolved from this method when used.
PT was another method that was observed to take up a tremendous amount of time implementing in the classroom. Despite creating a fair amount of conversations between the students within a group setting, there was no marked increase in effectiveness for this method as it was at par with many of the other methods.

Most of the data indicates that there is not one particular method that sets itself totally apart statistically from the other methods either being performed alone or in conjunction with another method. From a percentage viewpoint, most methods used were within ten percent of a middle value of 66%. However, the methods FA, HOA, and KM showed a slightly higher percentage of effectiveness when used in conjunction with another method. The FA and HOA methods also showed a trend towards higher discussions and responsiveness from the student populous.
Discussion and Conclusion

This research has provided a vast amount of insight to the use of various methods to learn science vocabulary. The methods while being very different in nature from each other have provided results that seem very similar on a numerical scale. In reflection, I have reviewed the methods and procedures used in the research and have evaluated their effectiveness and have noted strong points and weak points contained within them.

The vocabulary was chosen from a set of words that would normally be used within the seventh grade science curriculum through the year. As the year progressed, it became increasing evident that there was an academic gap between the student populous classrooms. Classroom designation 7C was performing at least ten percentage points or more on all classroom assessments consistently. Along with various student absences which tended to become more pronounced as the year progressed, the data was taken with a very inconsistent populous. There were other classrooms that could have matched closer academically to class designation 7E.

Many of the methods used can be very complicated to implement such as the reading methods PT, PR, and WR. I found it very difficult to master some of the techniques in the limited amount of times they individually were used. I became more attached to and familiar with a few of the methods that being FA and HOA. A teacher’s ability to effectively implement the methods can obviously be traced to their quantity of applications with the particular methods. Most likely, I am very familiar and comfortable implementing the following methods much more effectively FA, HOA, WMA and WMB.
Assessments of the particular methods posed a greater problem. It was extremely
difficult to manage the assessments of the methods on a consistent basis that used the
same assessment and same time frame between the learning and assessment. There were
times that a performance assessment was used one week beyond the lesson and other
times where a short answer assessment was performed the very next day. Since the
classes were in block increments, a more favorable condition would have been to use the
assessment during the same time during the period. These concerns would obviously
have some sort of effect on the data obtained. In addition, methods tended to be more
effective when the assessment was performed on a short term basis versus a long term
basis. Once again, this would tend to skew some of the results favoring the methods used
when the assessment was done within a day or two in lieu of a week beyond.

In such an undertaking, a vast amount of data must be obtained in a consistent
controlled environment. Due to the nature of the research, only a limited amount of data
was obtained for the project. There were instances where a method was only used twice
in the undertaking. The analysis of the data flowed well and the methods used were very
consistent. The matrix chart developed was very helpful in comparing various strategies
and their relationships between each other.

Based upon all of the results of the research, there are three main conclusions that
can be drawn. Despite many of the aforementioned shortcomings of the research, there
did not appear to be any significant advantage in using a single method in teaching the
vocabulary. There were slight indications that using the methods FA, HOA, and KM in
conjunction with another methods proved to increase the effectiveness of the vocabulary
teaching. Familiar association techniques provided classroom initiatives by the students.
The following suggestions would be made to continue a follow up research to this initial project.

- Use a much a larger consistent student populous that does not include honors, accelerated or special education factions (or just track the certain specified populous such as special education)

- Use a variety of seasoned teachers along with new teachers to use the methods in a more consistent fashion that would allow the method to be implemented accurately

- Use a similar assessment on all of the vocabulary words that would help bring consistency to the data

- Assess the method and vocabulary in two time frames one time frame being immediately or a day after the teaching and another assessment in a longer time frame to check on long term retention

- Determine a specific schedule for specific method(s) implementation giving all methods equal applications
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Moore, S. (2002). From Galileo to snowflake Bentley: Using literature to teach inquiry
in middle school science. *Science Scope*, 26, 10-12.


Appendix A

Numerical Data Analysis (see following page)
<table>
<thead>
<tr>
<th></th>
<th>Sum</th>
<th>WR</th>
<th>WMA</th>
<th>WMB</th>
<th>DGP</th>
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Appendix B

Daily work sheets (see the following pages)
DATE- 9-19-05  CLASS-  7c  METHOD- DGA

WORD(S) USED- HYPOTHESIS, EXPERIMENT, CONCLUSION

HOW INTRODUCED- PARTS OF SCIENTIFIC METHOD W/ORDER ASSOCIATION
   Used textbook glossary, dictionary

OBSERVATIONS/ REACTIONS- Students somewhat familiar and comfortable with this
   approach. Pictures were somewhat stimulating. No further exploration by class.

ASSESSMENT DATE- 9/23
ASSESSMENT METHOD- quiz with matching order
ASSESSMENT RESULT- 18/24=75%

DATE- 9/20/05  CLASS-  7e  METHOD- DGP

WORD(S) USED- HYPOTHESIS, EXPERIMENT, CONCLUSION

HOW INTRODUCED- PARTS OF SCIENTIFIC METHOD W/ORDER ASSOCIATION
   Used textbook glossary, dictionary

OBSERVATIONS/ REACTIONS- Students somewhat familiar and comfortable with this
   approach. Pictures were somewhat stimulating. Students interested in doing experiments
   associated with method.

ASSESSMENT DATE- 9/26
ASSESSMENT METHOD- quiz with matching order
ASSESSMENT RESULT- 11/22=50%
DATE-9/21/05  CLASS- 7c  METHOD- hoa

WORD(S) USED- Procedure

HOW INTRODUCED- Classroom procedure for exit firedrill....actually walked students thru with enumeration on large chart

OBSERVATIONS/ REACTIONS- Studtns questioning why we need to walk thru this drill....a waste of time....no previous procedure teaching.

ASSESSMENT DATE- 9/23
ASSESSMENT METHOD- hw about playing a CD

ASSESSMENT RESULT- 18/22 = 75%

DATE- 9/22/05  CLASS- 7e  METHOD- hoa

WORD(S) USED- procedure

HOW INTRODUCED- same as above

OBSERVATIONS/ REACTIONS- no association being made between firedrill and procedure link. Did a followup on pbj sandwich by making one in class.....lots of laughs.

ASSESSMENT DATE- 9/26
ASSESSMENT METHOD- hw about playing a cd

ASSESSMENT RESULT- 11/22 = 50%
DATE- 9/27/05 CLASS- 7c METHOD- km-fa

WORD(S) USED- stimulus response pair

HOW INTRODUCED- react to something, R before S, popcorn was popped in a microwave to produce saliva

OBSERVATIONS/ REACTIONS- studtns know cause and effect but not this pair, Reteaching this is like that.......students talk back and forth , assigned hw

ASSESSMENT DATE- 9/29
ASSESSMENT METHOD- quiz with identifying S/R

ASSESSMENT RESULT- 11/22= 50%

DATE-9/28/05 CLASS- 7e METHOD- km-fa

WORD(S) USED- same

HOW INTRODUCED same

OBSERVATIONS/ REACTIONS-some know cause and effect......reteaching similar to above. Assigned hw

ASSESSMENT DATE- 9/30
ASSESSMENT METHOD- same as above

ASSESSMENT RESULT- 15/21 = 71%
DATE- 9/29/05 CLASS- 7c METHOD- hoa-fa

WORD(S) USED- mass and length

HOW INTRODUCED familiar objects used such as basketball, paperclip, CD for mass with assigned values......fingernail used for length cm....studtnts observe familiar objects and associate the values

OBSERVATIONS/ REACTIONS- students a bit standoffish....warm up quickly with many questions.
Mass concept difficult.....sclae introduced...studtnts observe how it works..and try to draw a correlation between operation and mass

ASSESSMENT DATE- 10/7
ASSESSMENT METHOD- performance with tools and questions

ASSESSMENT RESULT- 16/23 = 70%

DATE- 9/30 CLASS- 7e METHOD- hoa-fa

WORD(S) USED- same

HOW INTRODUCED same

OBSERVATIONS/ REACTIONS- not many questions...students make contact with objects and maintain attention......mass concept difficult......introduce scale as in above....similar reaction

ASSESSMENT DATE- 10/1
ASSESSMENT METHOD- same as above

ASSESSMENT RESULT- 11/20 = 52%
DATE-10/12  CLASS-7c  METHOD- pt-pd

WORD(S) USED-adaptation

HOW INTRODUCED- in pairs, each reads diff. article on adaptation and answer questions together……questions generate conversation

OBSERVATIONS/ REACTIONS- students object to different readings and want to same…..very difficult to generate conversation in class……very difficult to maintain order in class

ASSESSMENT DATE- 10/20
ASSESSMENT METHOD- quiz examples
ASSESSMENT RESULT- 17/24 = 71%

DATE- 10/13/05  CLASS-7e  METHOD- pt-pd

WORD(S) USED-same

HOW INTRODUCED same except the questions were issued after the readings

OBSERVATIONS/ REACTIONS- same as above with students focusing on example to remember

ASSESSMENT DATE- 10/21
ASSESSMENT METHOD- quiz examples
ASSESSMENT RESULT- 13/23 = 57%
DATE- 10/24/05    CLASS- 7c    METHOD- hoa-km

WORD(S) USED- bilateral radial asymmetry (symmetry)

HOW INTRODUCED- with funny shapes emphasizing ladder in bilateral, radius in radial for round, and A meaning not in asymmetrical...students cutout shapes and label

OBSERVATIONS/ REACTIONS- all new to terms...east to work with ladder and radius, students enjoy cutouts.....seem to grasp

ASSESSMENT DATE-10/26
ASSESSMENT METHOD- bellwork examples

ASSESSMENT RESULT- 20/24 = 80%

DATE- 10/25/05    CLASS- 7c    METHOD- hoa-km

WORD(S) USED-same

HOW INTRODUCED same

OBSERVATIONS/ REACTIONS- same......ladder orientation questioned by two students (a very good observation and question)

ASSESSMENT DATE-10/27
ASSESSMENT METHOD- same

ASSESSMENT RESULT- 15/19 = 79%
DATE- 10/28/05  CLASS- 7c  METHOD- pt

WORD(S) USED- parasite, host

HOW INTRODUCED students read textbook vs article...they collectively answer 3 questions in a group ......graded as a group

OBSERVATIONS/ REACTIONS- students are getting comfortable with pir work...worksheets completed by all groups....very good indication of progressing toward cooperative situations

ASSESSMENT DATE-11/1
ASSESSMENT METHOD- bellwork examples

ASSESSMENT RESULT- 16/21 = 76%

DATE- 10/31  CLASS- 7e  METHOD- pt

WORD(S) USED-same

HOW INTRODUCED same

OBSERVATIONS/ REACTIONS- same ...some indications of flip flopping definitions

ASSESSMENT DATE- 11/2
ASSESSMENT METHOD- same

ASSESSMENT RESULT- 12/20 = 60%
DATE- 11/1/05  CLASS- 7e  METHOD- km-fa

WORD(S) USED- mollusk

HOW INTRODUCED snail used as the device with soft body on one side and mollusk on the other........used as a visual cutout

OBSERVATIONS/REACTIONS- students really enjoy the sponge bob associations with the lessons.....they are quite familiar with the characters and embrace the associations

ASSESSMENT DATE- 11/14
ASSESSMENT METHOD- unit test – identify the phylum type using actual animals

ASSESSMENT RESULT- 17/21 = 81%

DATE- 11/2 CLASS- 7e METHOD- km-fa

WORD(S) USED- same

HOW INTRODUCED same

OBSERVATIONS/REACTIONS- same.........want to look at more characters!

ASSESSMENT DATE- 11/15
ASSESSMENT METHOD- same

ASSESSMENT RESULT- 15/20 = 75%
DATE-11/3/05  CLASS- 7c  METHOD- km-fa
WORD(S) USED- arthropod
HOW INTRODUCED similar to mollusk with jointed foot used … an ant was used
Cutouts by students
OBSERVATIONS/ REACTIONS- once again students are engaged by cutouts and putting
letter on the cutout

ASSESSMENT DATE- 11/14
ASSESSMENT METHOD- unit test identify phylum types
ASSESSMENT RESULT- 17/22 = 77%

DATE- 11/4  CLASS- 7e  METHOD- km-fa
WORD(S) USED- same
HOW INTRODUCED same
OBSERVATIONS/ REACTIONS- same

ASSESSMENT DATE-11/15
ASSESSMENT METHOD- same
ASSESSMENT RESULT- 15/21 = 71%
WORD(S) USED- echinoderm

HOW INTRODUCED- used sponge bob charater Patrick......derms = skin from dermatologist.....cutout used very similar to mollusk/arthropods

OBSERVATIONS/ REACTIONS- students performing fun in a light hearted environment....students want to watch the movie.....very engaged

ASSESSMENT DATE- 11/14
ASSESSMENT METHOD-unit test with actual animals and identification

ASSESSMENT RESULT- 13/20 = 65%

DATE- 11/8
CLASS- 7e
METHOD- km-fa

WORD(S) USED-same

HOW INTRODUCED same

OBSERVATIONS/ REACTIONS- same

ASSESSMENT DATE-11/15
ASSESSMENT METHOD-same

ASSESSMENT RESULT- 13/21 = 62%
DATE- 11/28/05  CLASS- 7c  METHOD- pr-hoa

WORD(S) USED- cartilage-spinal cord- vertebrae

HOW INTRODUCED- class already know vertebrates….we build on old and introduce the new….paired reading with coloring a picture with labels……each student colors their own

OBSERVATIONS/ REACTIONS- ears and nose and sharks are used as examples in a lengthy discussion with class……realization of their own bodies provides some engagement

ASSESSMENT DATE- 11/30
ASSESSMENT METHOD- bellwork drawing with a label similar to assignment the previous day

ASSESSMENT RESULT- 15/22 = 68%

DATE- 11/29  CLASS- 7e  METHOD-pr-hoa

WORD(S) USED-same

HOW INTRODUCED same

OBSERVATIONS/ REACTIONS- same

ASSESSMENT DATE- 12/1
ASSESSMENT METHOD- same

ASSESSMENT RESULT-12/20 = 60%
DATE- 12/6/05          CLASS-  7c         METHOD- pr

WORD(S) USED- ectotherm, endotherm

HOW INTRODUCED – in pairs, I article on ectotherm and he other on endotherm…..studenhs read and discuss and answer 5 questions on the subject

OBSERVATIONS/ REACTIONS- students recognize the word therm from thermometer and know it has something to do with temperature……the key is to know which is which

ASSESSMENT DATE- 12/8
ASSESSMENT METHOD- bellwork definitions asked…

ASSESSMENT RESULT- 13/21 = 62%

DATE- 12/7          CLASS-  7e         METHOD- pr

WORD(S) USED- same

HOW INTRODUCED same

OBSERVATIONS/ REACTIONS- same but showed the student’s ecto has a c for cold blooded

ASSESSMENT DATE- 12/9
ASSESSMENT METHOD- same as above

ASSESSMENT RESULT-12/20 = 60%
WORD(S) USED- amphibian

HOW INTRODUCED- the class has frogs in it that have a set of rocks in the tank and water areas....this example shows land and water

OBSERVATIONS/ REACTIONS- the students know frogs and were introduced by looking at the live one and tadpole in ward safe fluid

ASSESSMENT DATE- 12/12
ASSESSMENT METHOD- quiz with fish/amphibian questions....definition asked for with example

ASSESSMENT RESULT-15/22 = 68%

DATE- 12/9 CLASS- 7e METHOD- fa

WORD(S) USED- same

HOW INTRODUCED- same

OBSERVATIONS/ REACTIONS- same with question on how they breathe air and water

ASSESSMENT DATE- 12/13
ASSESSMENT METHOD- same

ASSESSMENT RESULT- 15/22 = 68%
DATE- 12/14/05   CLASS- 7c   METHOD- km fa

WORD(S) USED- mammals

HOW INTRODUCED- word is almost the same as man, hair vertebrate like their own self students write about familiar animals ...3 sentences on each....

OBSERVATIONS/ REACTIONS- easy correlation...but more difficult to see other types of mammals in the mix......... many questions.......not engaged well on this one

ASSESSMENT DATE- 12/20
ASSESSMENT METHOD- unit test on animals...association on each class with pictures

ASSESSMENT RESULT- 20/23 = 87%

DATE- 12/15   CLASS- 7e   METHOD- km-fa

WORD(S) USED- mammals

HOW INTRODUCED- same

OBSERVATIONS/ REACTIONS- same

ASSESSMENT DATE- 12/21
ASSESSMENT METHOD- same

ASSESSMENT RESULT- 15/21 = 71%
DATE- 1/5/06   CLASS- 7c   METHOD- pd-fa

WORD(S) USED-carbohydrates-proteins-lipids

HOW INTRODUCED- pairs....students discuss pizza types and the various toppings they like...and put them into categories

OBSERVATIONS/ REACTIONS- engaged and enjoy coming up with their own pizza topping...some groups are off task...went too long with discussion time

ASSESSMENT DATE- 1/9
ASSESSMENT METHOD- bellwork assignment...identify six items carbs-lipids-prot

ASSESSMENT RESULT- 11/19 = 58%

DATE- 1/6   CLASS- 7e   METHOD-pd-fa

WORD(S) USED-same

HOW INTRODUCED- same

OBSERVATIONS/ REACTIONS- same with inquiry about a pizza party

ASSESSMENT DATE- 11/10
ASSESSMENT METHOD- same

ASSESSMENT RESULT- 10/21 = 48%
DATE- 1/9/06  CLASS-  7c  METHOD- hoa

WORD(S) USED-digestion, ingestion

HOW INTRODUCED- ritz crackers used to all students...students take ingestion to mouth...break up in mouth for digestion

OBSERVATIONS/ REACTIONS-indigestion was confused with indigestion......I side stepped lesson to show indigestion......students like any food and similar activities

ASSESSMENT DATE- 1/11
ASSESSMENT METHOD- bellwork assignment  definitions of their own modified to show indigestion

ASSESSMENT RESULT-17/21 = 81%

DATE- 1/10  CLASS-  7e  METHOD- hoa

WORD(S) USED- same

HOW INTRODUCED- same w/ indigestion brought in early

OBSERVATIONS/ REACTIONS- similar confusion

ASSESSMENT DATE- 1/12
ASSESSMENT METHOD- same

ASSESSMENT RESULT-14/20 = 70%
DATE- 1/11/06        CLASS- 7c        METHOD- wma - fa

WORD(S) USED- absorption

HOW INTRODUCED- sponge and water shown as demonstration, students fill out form on their own

OBSERVATIONS/ REACTIONS- somewhat familiar with forms from ELA classes.....what is not/antonym is somewhat confusing.......all students do not complete form.........not very engaged with form itself

ASSESSMENT DATE- 1/18
ASSESSMENT METHOD- quiz on digestion/nutrients section....describe absorption

ASSESSMENT RESULT- 13/20 = 65%

DATE- 1/12        CLASS- 7e        METHOD- wma - fa

WORD(S) USED- same

HOW INTRODUCED- same

OBSERVATIONS/ REACTIONS- same

ASSESSMENT DATE- 1/19
ASSESSMENT METHOD- same

ASSESSMENT RESULT- 12/21 = 57%
DATE-11/18/06               CLASS-  7c               METHOD- wma- fa

WORD(S) USED- structure- protect

HOW INTRODUCED- overhead of skyscrapers used with metal frame works.......cd case used to show protection...............word map filled out individually

OBSERVATIONS/ REACTIONS- structure a bit difficult to grasp......conversation spoarked in the classroom about house, rocks, cars.............family protection mentioned by a student

ASSESSMENT DATE- 1/20
ASSESSMENT METHOD- bellwork what two functions does the skeleton do ...describe them

ASSESSMENT RESULT- 18/22 = 82%

DATE-    1/19               CLASS-  7e               METHOD- wma fa

WORD(S) USED-same

HOW INTRODUCED- same

OBSERVATIONS/ REACTIONS- same with holds things together by someone......house mentioned also

ASSESSMENT DATE-1/23
ASSESSMENT METHOD- same

ASSESSMENT RESULT-15/21 = 71 %
DATE- 1/20       CLASS- 7c       METHOD- wma-fa

WORD(S) USED-joint (ball & socket, hinge, glide)

HOW INTRODUCED- join is similar to joint......examples of each used door hinge, shoulder socket, gliding hang gliding.......... 

OBSERVATIONS/ REACTIONS- put together nicely by students....dope brought up by student........types of joints a bit confusion...somewhat engaged...

ASSESSMENT DATE-1/26
ASSESSMENT METHOD- quiz on musco skeleton 2 multiple choice....identify by pictures the types

ASSESSMENT RESULT- 16/23 = 70%


DATE- 1/23       CLASS- 7e       METHOD- wma-fa

WORD(S) USED- same

HOW INTRODUCED- same

OBSERVATIONS/ REACTIONS- same


ASSESSMENT DATE-1/27
ASSESSMENT METHOD- same

ASSESSMENT RESULT- 12/21 = 57%
WORD(S) USED- voluntary-involuntary

HOW INTRODUCED- demo setup in room where I ask students for a volunteer to pass out books...after books passed out I describe how it was a choice...in means not...students look up definitions and write them down

OBSERVATIONS/ REACTIONS-volunteer is somewhat familiar.....in was confusing....what about ingestion? by a student. ..... 

ASSESSMENT DATE- 1/26
ASSESSMENT METHOD- quiz......describe both types of muscles
ASSESSMENT RESULT- 19/21 = 90%

DATE- 1/26  CLASS- 7e  METHOD- dgp-fa
WORD(S) USED-same

HOW INTRODUCED- same

OBSERVATIONS/ REACTIONS-same

ASSESSMENT DATE- 1/27
ASSESSMENT METHOD- same
ASSESSMENT RESULT- 16/20 = 80%
WORD(S) USED: respiration

HOW INTRODUCED: textbook paired reading with a drawing that they colored

OBSERVATIONS/REACTIONS: a very complicated term with much involved... many questions... confusing with breathing during discussions... moderate engagement

ASSESSMENT DATE: 2/1
ASSESSMENT METHOD: bellwork assignment fill in the blanks with clues on the process
ASSESSMENT RESULT: 11/19 = 59%

DATE: 1/31
CLASS: 7e
METHOD: pr-hoa

WORD(S) USED: same

HOW INTRODUCED: same... modified to differentiate from breathing

OBSERVATIONS/REACTIONS: same confusion

ASSESSMENT DATE: 2/2
ASSESSMENT METHOD: same
ASSESSMENT RESULT: 10/21 = 48%
DATE- 2/9/06     CLASS- 7c     METHOD- wmb

WORD(S) USED- reproduction

HOW INTRODUCED- re- again.....produce---make.........tion –process of
Students fill in with sentence and picture

OBSERVATIONS/ REACTIONS- wordbreakdown was surprisingly receptive
Most pictures were of one parent and offspring.....one was an egg

ASSESSMENT DATE-2/13
ASSESSMENT METHOD- bellwork quiz.....in your own words describe reproduction

ASSESSMENT RESULT- 17/22 = 77%

DATE- 2/10     CLASS- 7e     METHOD- wmb

WORD(S) USED- same

HOW INTRODUCED- same

OBSERVATIONS/ REACTIONS- same  w/ questions about other body systems

ASSESSMENT DATE- 2/14
ASSESSMENT METHOD-same

ASSESSMENT RESULT-12/21 = 57%