Cherry Creek Science Website

Final Report
Mathematics and Computer Science Field Session

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Table of Contents

Project Abstract

1. INTRODUCTION
1.1 Purpose

The team has redesigned a website that provides science students with interactive practice material that will supplement both their Physical Science Honors and Chemistry Honors course requirements. Ethan Dusto, a science teacher at Cherry Creek High School, previously requested the site cover the topics of physics, earth science, and chemistry by the way of summaries, quizzes, and interactive activities. While the site currently accomplishes all of these items, Ethan Dusto requested a few modifications and additions be made.

1.2 Requirements and Specifications

The main focus of the project was to redesign the website so that it is appropriate for high school students. A large complaint to the client from the users is that the site was visually elementary and was undesirable to the students; therefore the students were simply not visiting the site. The activities on the site are very informative but difficult to understand if the topic is not already understood. As a result, the requirements were to create a more user-friendly environment targeting the activities on the site as well as the organization of the readings, notes and summaries. When creating the redesigned activities, we requested the opinion of the students. The team kept in contact with a group of students who volunteered to test the progress and encouraged new ideas for the team to address.

Currently the website is set up to provide students only with material for the Physical Science Honors course. Chemistry Honors information has been included on the site, as in following years Mr. Dusto will be teaching with emphasis on either subject. The activities already accomplish this task. Thus, the main page, summaries, quizzes and notes are left to be updated.

On the main page of the web site, Mr. Dusto requested that a message board be placed where the students may see assignments they are required to complete. This message board is easy to update and Mr. Dusto will revise it daily.

Mr. Dusto also requested a system in which the students could complete assigned quizzes as homework. The system would need to track who completed the quiz, what grade they received, and the time they completed it. If time permitted, more activities to encourage student participation and learning were requested. A matching game was proposed. This would facilitate students' learning vocabulary and the periodic table.

1.3 Functional

The project comprises three subsystems that together satisfy the client's requests. These are the Interface, the Activities, and the Quizzes, including the Logins/Database. Since the site has already been created, the team added content and functionality, making it more visually appealing, and fixing bugs within each of these subsystems.

1.3.1   Interface

Some of the feedback given to Mr. Dusto on the interface is that it is difficult to use, visually repelling, and "Dumb." Students do, however, like the concept and still try to use some of the functionality. To start with, the site needed to be more visually appealing. Changing the backgrounds, fonts, and layout makes the site more appealing to the average high school student. This was confirmed by having students test the new design and giving the team constant feedback.

There were simple fixes to some of the links that were not functioning at all and removed unnecessary links. A new message board was added for Mr. Dusto to put up announcements for his students. Each message displays date and time of the post, a subject header, and has room for a lengthy body. Within the body there can be text, links, and pictures. The site now includes a spot for Mr. Dusto's honors chemistry class that has similar functionality as the physical science information. The setup of the main page is shown in figure 1.
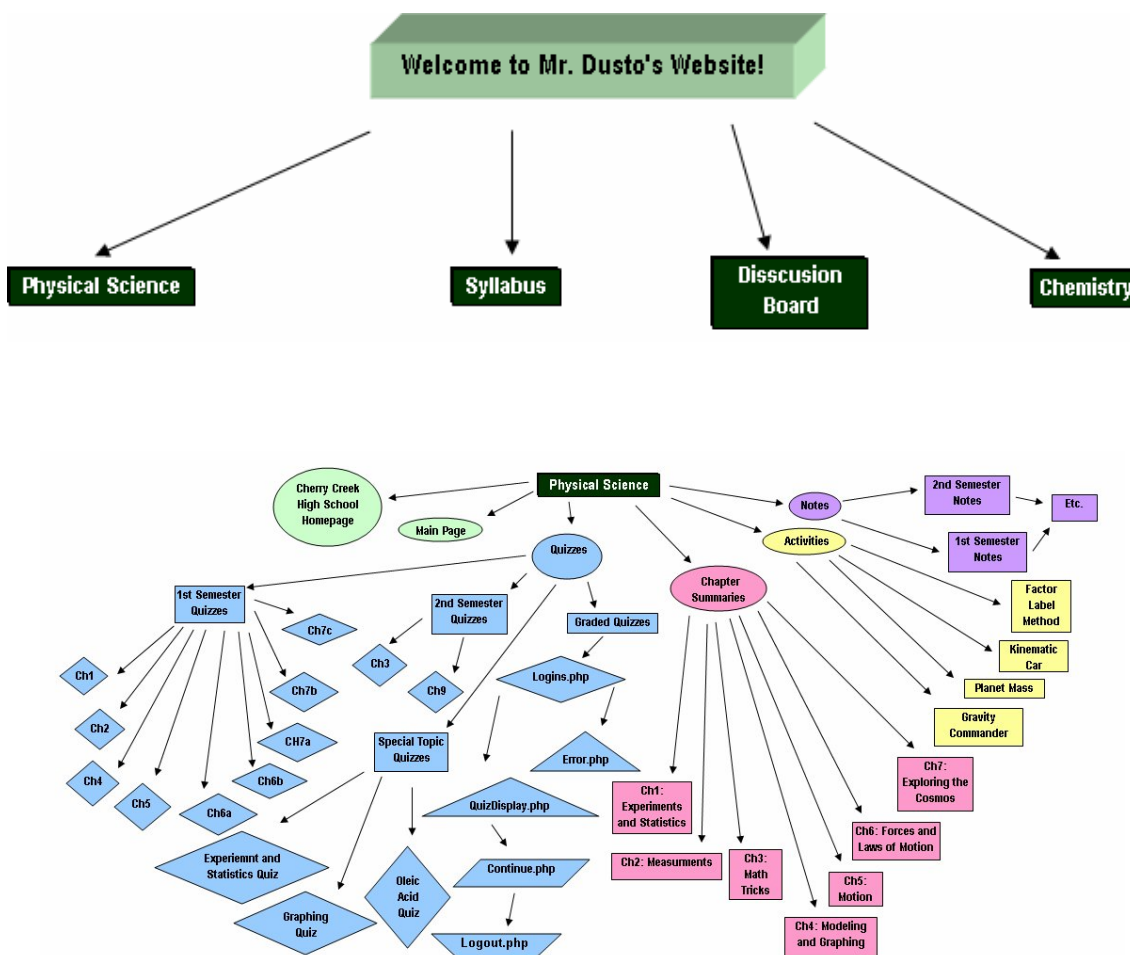

Figure 1: Flow of the website links

1.3.2   Activities

For the most part, the activities only needed minor fixes. The current activities are: Factor Label Method, Kinematic Car, Gravity Commander, and Planet Mass. To help explain an activity, a pop-up menu will be displayed every time the activity starts. This information needs to include a more in-depth idea of how to use the activity and what the students should be getting from it.

Factor Label Method:
- Include more questions to choose from
- More inclusive list of the conversions of units and make sure the conversion is valid
- Add a calculate button to output the conversion generated in the table
- Fix original fish graphics from previous coding
- Change title to better fit the activity

Kinematic Car:
- Include more challenges and add overall clarity of what is happening
- Update graphs to be easier to read and understand
- Add units to graphs.
- Include a help pop-up display
- Fix the home link.

Gravity Commander:
- Show a pop-up box with a full in-depth explanation upon starting
- Explain the correspondence between the action buttons and the outcome boxes
- Fix the home link

Planet Mass:
- Add a help menu to explain the main idea of the game instead of starting the steps without realizing the ultimate goal
- Fix the home link

If time allowed a new activity would have been added for matching vocabulary/element symbols of each chapter with its corresponding definition or element name.

1.3.3   Logins/Database

Mr. Dusto would like the capability for students to log into the site to take a graded quiz. He requests the name of who took the quiz, the grade they got and the time they took the quiz to be organized in a database where Mr. Dusto can access it. This will require a database of usernames and passwords for the students. Mr. Dusto can set these via the easy to use interface to add students to the database. In this interface, he can view user names and passwords, edit a student's settings, and erase students from the database.

1.3.4   Quizzes

After the students login to the database, they will have the choice of picking a quiz number or taking a random quiz depending on what Mr. Dusto assigns them. Mr. Dusto has the ability to allow students to choose which quizzes to randomize or choose to set it himself. This will help students when studying for an exam. Mr. Dusto can also set the number of multiple choice questions he would like the quizzes to contain. The non-randomized quizzes have a set of consistent questions for each student, and all quizzes have randomized answer order. The quizzes are constructed using the quiz creator. The quiz creator is a user interface for Mr. Dusto to add/erase quizzes and quiz questions.

1.4   Non-Functional

The web site is accessible from any commonly used browser. The tools used are available on West Host, where Mr. Dusto chose to host his website. Mr. Dusto will be able to easily modify notes, readings, quizzes, and the message board.

2.   DESIGN AND SOLUTION APPROACH
2.1   Interface

When discussing how to improve the website with Mr. Dusto, he found that his students thought the website was "dumb". It was also difficult for them to locate what they were looking for. He also wanted to include a place for his Chemistry Honors class where he would be able to post the notes and chapter summaries, similar to the Physical Science section of the site. In order to meet the client's requests, additions to the menu were included. The menu is vertical on the left side of the site, with pull out menus reaching to the right. When hovered over the contents under the heading are displayed. A new space background for each page on the site was added giving the site less of an elementary appearance as well as incorporating the science theme. The main page also includes a message board where Mr. Dusto can inform the students what to focus on. Figure 2 shows what the website home page looks like with the changes made.
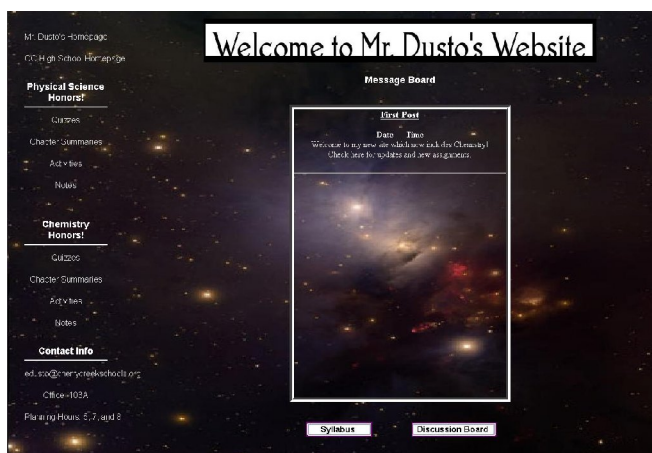

Figure 2: Home Page on Mr. Dusto's Website

2.2　Quizzes

Talking with the students, it was clear that they used the quizzes in preparation for their in-class quizzes and tests. Understanding this, they will be divided into two distinct sections, practice and graded. The practice quizzes will strictly be for practice to help the students. Upon completion of the quiz, the students will be given their score and time of completion. Mr. Dusto can access a database that will contain information regarding which quiz the student took, at what time, and their score.

The quizzes are now separated into three sections on the pullout menu. These sections are chapter quizzes, special topic quizzes and graded quizzes. The practice quizzes are organized by chapter. Each quiz will give the students hints until the correct answer is selected. The special topic quizzes do not let the student continue until the current question is answered correctly. The graded quizzes will direct the students to a login screen where they must enter their username and password that Mr. Dusto provided for them. The students will then have a choice between taking a specifically numbered quiz or a randomized quiz. Mr. Dusto must tell the students which type of quiz he would like them to take. If he chooses the specifically numbered quiz, Mr. Dusto must also tell the students the number of the quiz he wants them to take. Then they will be directed to a quiz with questions that are consistent for each student but the order of the answers is randomized. If Mr. Dusto chooses the randomized quizzes he then has two options. He can decide which quizzes he wants added/omitted to the randomization and set the quiz creator to his specifications. He can also add the ability to let the students pick which quizzes they would like the quiz creator to randomize. This is included to help the students study for an exam. This way they can choose the quizzes they struggled with to get extra practice. The randomized quizzes pick a specified number of questions from a database and then randomize the questions for each student. For example, if there are thirty questions in the quiz 1 database and twenty questions in the quiz 2 database, and Mr. Dusto decides he wants this randomized quiz to have ten questions on it. The quiz creator will randomly pick ten questions from the entire fifty question database. Therefore, each student will have a different set of ten questions as well as a different order of the answer choices. After the quiz is completed, the students will be directed to a logout page where they can exit out of the system. The graded quizzes will not give hints and will continue whether the answer is right or wrong. This setup creates many questions the students have available to them, and can select the ones he/she needs more practice with.

2.3　Logins/Database

The login design is a pretty simple layout. There is a login page that prompts the students for their section, user login name, and password. This accesses the database which matches the specified section, user name, and password to an entry in the database. If the database cannot find a match, the student will be redirected to a page that displays that either their user name and/or password are incorrect. If the user name and password are correct, the site will guide them to a page with the different quizzes and the corresponding quiz number. This design is shown in Figure 3.
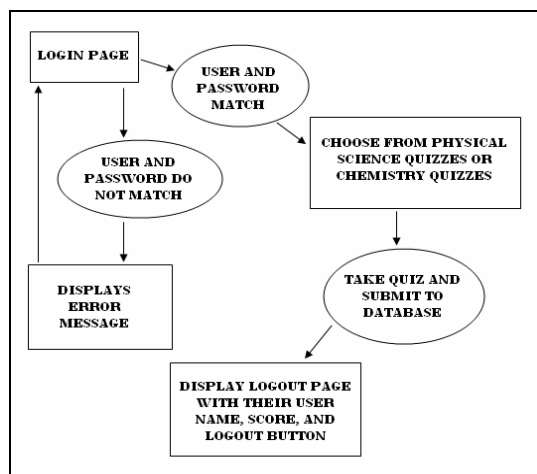
Figure 3: Layout of the Login Page

When thinking about the design of the logins, it was important that the users' information was stored as well as their score and the quiz number they took. To pass information from the login to the quiz page and into the database, two possibilities were considered, cookies and PHP sessions.

2.3.1 Cookies

Cookies store the information on the user's computer and the information is easy to obtain, meaning they are not very secure. With cookies, it is possible to adjust the amount of time they exist on the users' computer and the data can be obtained until the cookie "dies", which would be a benefit. A disadvantage is that the user has to have cookie support enabled. It is not a good assumption to assume the students would know how to turn on the cookie support. Also, the student's sensitive information, such as password, would be available to anyone with access to the same computer.

2.3.2 PHP Sessions

When a PHP session is started, a session ID is assigned and the computer automatically tries to save information in a cookie. If cookies are disabled it will put the session ID through the URL. This eliminates the problem that using cookies potentially creates. PHP sessions are somewhat more secure than cookies because the users only have access to the ID and cannot change the information in it. However, they are still not very secure. A disadvantage to PHP sessions is that the information stored is only saved until the user exits out of the browser.

Observing the pros and cons of cookies and PHP sessions, it was decided to use PHP sessions. Mainly because of the extra difficulty cookies create and they are less secure than PHP sessions.

2.4   Login Process

Once the students click under the "Quizzes" heading and select "Graded Quizzes" on the web page, they will be directed to the login page. The code for the login process utilizes PHP with html and MySQL. A basic understanding of each language is needed to create this aspect of the project. The layout of the page is straightforward. It welcomes the user and prompts them for their section, login user name and password as seen in Figure 4.
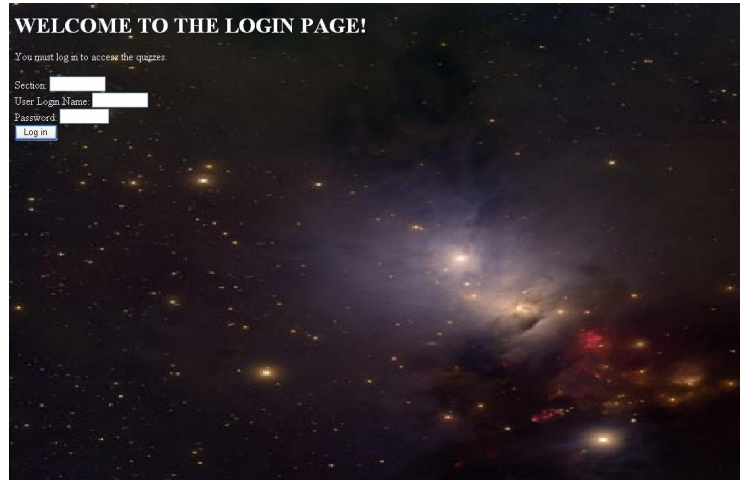

Figure 4: Layout of the Login Page

In the code for this page, since we are using sessions, we have to start it with:
"session_start();"
This starts the session for the user and stores the information needed in the $_SESSION[] variables. The start function must be included in every file where $_SESSION[] variable is needed and used. In the code, the database will be searched to match the section, login name, and the password.

If a student attempts to login and the user name or their password is incorrect it will direct them to a page saying 'Access Denied' as shown in Figure 5. At this point, the student is able to go back using the back button, and re-enter their information correctly so they can take their quiz.
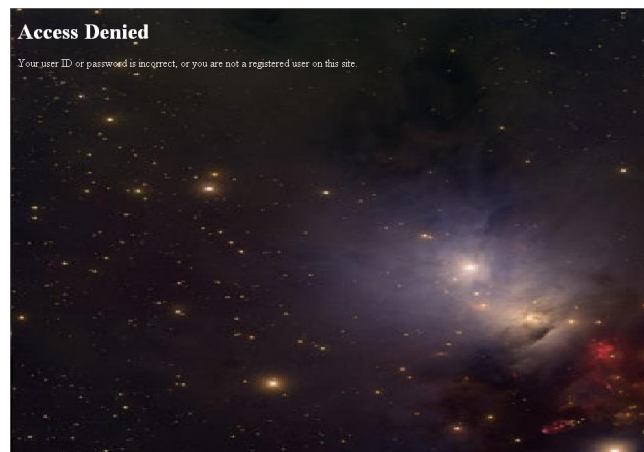

Figure 5: Access Denied Page

Once their information is correct it will lead them to a page that lists the quizzes where the student will need to know which quiz number to choose which will be posted on the message board from Mr. Dusto. The student will be able to choose which quiz to take by typing in the quiz number into the box or choosing the random quiz button and submitting. This will allow the variable "quiznum" to be stored as a $_SESSION[ ] variable which will be submitted into the database. Figure 6 shows what the students will see once they log in.
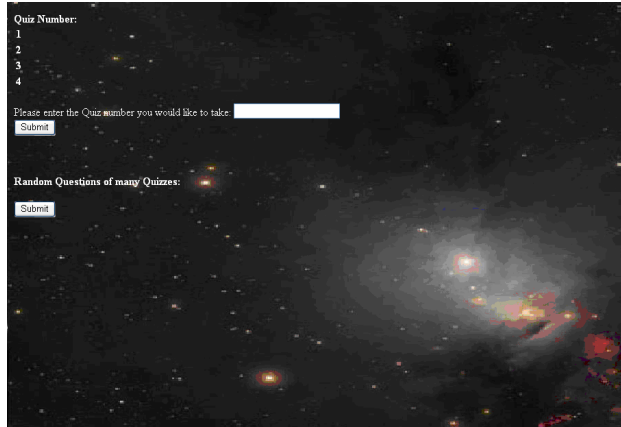

Figure 6: After the student has logged in, a list of quizzes will be presented.

After selecting which quiz to take, the student will be linked to a page that displays the quiz that was chosen.

Once the quiz has been completed, the student will submit the quiz with the 'Submit' button which will enter the information into the database so it can be reviewed by Mr. Dusto. The program will then continue to a page that displays the login user name, score, time, and thanks the student for taking the quiz. There will also be a logout button on this page. Clicking the logout button will guide the student to a page with a message displaying the logout was successful and a link to go back to Mr. Dusto's homepage. When the student is logging out, the code unsets and clears the sessions of the information that was stored.

During the login process, there is some "behind the scene work" that has been going on, which is the database where all of the information is stored so Mr. Dusto can review it. The next section describes the database that is used throughout the login and quiz pages.

2.5   Database

This section describes the tables that can be added to, deleted from, or changed by Mr. Dusto.

2.5.1   Interface for the Quiz Database

The interface allows you to add or delete sections, students, logins, etc. The page that Mr. Dusto can use to add each student with login and password is shown in Figure 7. Also, examples of the corresponding tables are shown in Figure 8.
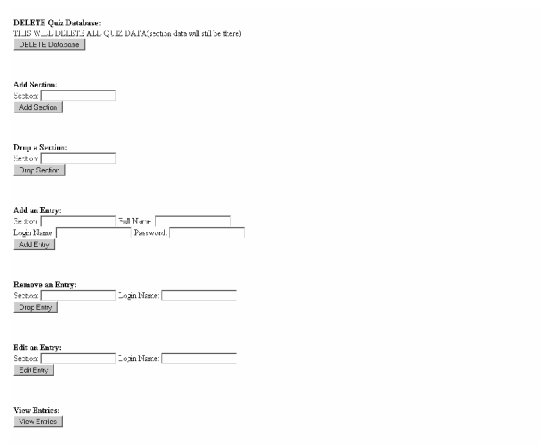
Figure 7: Interface for making the tables and editing the table's data

Science		
Name	Login	Pswd
Billy Bob	Bbob	iluvpizza
Sara Sue	Ssue	princess02
Johnny Jack	Jjack	roflmaobbq

Chemistry		
name	login	pswd
Silly Sob	Ssob	12345
Jara Jue	Jjue	54321
Bohnny Back	Bback	13524

Figure 8: Display of the Sections Tables. Logins and passwords of the students divided up in sections.

2.5.2   Quiz Table

The quiz table consists of the logins for each student, the quiz number, grade received, and the time that it was submitted. Once a student is finished taking a quiz and submits it, all of the session variables (login, password, quiz number, and score) are submitted into the Quiz Table. Mr. Dusto may view this as shown in Figure 9.

		(%)	(YY:MM:DD:HH:MM:SS)
Quiz			
Login	QuizNum	Grade	Time_
Bbob	1	80	05:29:16:22:12
Ssue	1	95	05:31:08:02:56
Jjack	1	67	05:30:12:36:02
Bbob	2	44	05:22:20:44:34
Ssue	2	89	05:22:10:59:09
Jjack	2	76	05:24:18:12:42
Ssob	1	44	05:22:20:44:34
Jjue	1	89	05:22:10:59:09
Bback	1	76	05:24:18:12:42
Ssob	2	80	05:29:16:22:12
Jjue	2	95	05:31:08:02:56
Bback	2	67	05:30:12:36:02

Figure 9: The Quiz Table

2.5.3   Quiz Creator

The idea of the quiz creator is to allow Mr. Dusto to have the freedom to create his own quizzes, and have his students take them, possibly for a grade in his class. As shown in Figure 10, Mr. Dusto can add, modify, and delete quizzes and questions. He can type in the questions and the various choices of answers. The questions with answers will also be in a table format as illustrated in Figure 11.

Figure 10: Quiz Creator

QuizQuestion						
QuizNum	QuestionNum	Question	Answer1	Answer2	Answer3	Answer4
1	1	1+1=	2	4	3	1
1	2	Bob's last name is	Smith	Bill	Joe	Sue
2	1	The sky is Green	False	True		

Figure 11: Quiz Question Table

3.   Implementation
3.1   User Interface
3.1.1   File Organization

Mr. Dusto's site is hosted on a server called westhost. All of the files the site was using were laid out one by one on this server. There were no folders or any organization at all. Therefore all of the file structure was modified into nested folders in order to make finding, deleting, or adding files simpler.

All of the notes and readings have been scanned into the computer from Mr. Dusto, therefore each page is in a different file. This was frustrating for the students to have to close and open a file every time they came to a new page. So each reading or set of notes was compiled into a single pdf file so that the students could have an entire reading in

one file. This also made it possible for students to not have to download all of the notes and readings, although they can still view them via adobe.

3.1.2   CSS, Index, and Activities

The overall appearance of the site is created using a cascading style sheet. This creates the space background, the pullout menus, font style and color on every sheet that the css is included on. The pullout menus were created using unordered lists and using the css to organize the lists into pullout menus.

The index is an HTML document that starts off containing the code that is used to support Internet Explorer using pullout menus. The menus will not work in Internet Explorer unless this piece of code is introduced. A table was then created in order to separate the navigation bar down the left side of the screen and the message board on the main portion of the screen.

Tables were used instead of frames because of the support that frames need in order to run properly. The browser must support frames, and if it does not, then a piece of code would have to be added that would direct them to a page that does not use frames. This felt redundant and pointless, so frames were not used in the creation of this site.

Each item on the unordered list is a link. The link will send the student to the page they requested or to a page with more navigation options. This was added as an assurance that even if the pullout menus do not work for a student, they can still get to the notes, quizzes, and summaries without using the pullout menus. Areas are saved for chemistry notes, summaries, and quizzes to be added to the front page. Comments are in the code to make it easy for Mr. Dusto to find where to add notes, quizzes and summaries for chemistry. Now that the files are all organized into folders, it will be easy for him to add the files.

The message board was created by just using a scroll box, and mixing it with the style sheet. The scroll box will let you type as much as you need and then a scroll bar will pop up on the side. It will keep adding information which can be seen by moving the scroll bar, or Mr. Dusto can erase and start the information all over again each time he uses the message board.

Mozilla Firefox, Internet Explorer, and Macintosh computers all need to be able to use this site, therefore, all different browsers were tested. Internet explorer needed support to run the pullout menus, Firefox has a tendency to be picky about the order of the html as well as if all opened brackets are then closed again, where IE is much more forgiving for these mistakes. The Macintosh browsers had difficulty with the images added to the site, so extra support was added in order to fix this problem.

The changes to the activities were not possible because the team did not have access to the source code. After some research into where the files could be located, it was decided that the design of the activities would have to be left for future work. The files still have the ability to execute the code, although it can not be changed. Therefore, the background and the links correspond to the new appearance of the site for each activity as the css could be added to the HTML portion of the activities.

3.2   Login Implementation

The login pages are all programmed using PHP with HTML and MySQL.
PHP: Hypertext Preprocessor is a scripting language embedded with tags that allows the creator to use both HTML and PHP in the same document. The idea is to create dynamic web pages. Also since it is executed on the server, the user is not able to access the PHP code, only the HTML.

The login code starts with a PHP function, start_session(). Start_session() is used at the very top of every PHP page where any of the $_SESSION[] variables are used. Since the variables hold the information until the browser is closed, the start_session() function will either start a new session or continue the current one based upon the session id. Once the user inputs their user name and password, it is stored in the $_SESSION[] variables and, a MySQL query searches the database. "SELECT * FROM science WHERE user='$login' AND password='$password' AND section='$section'"; looks in the database for the user name, password, and section. If they all do not match, an error function will be called displaying that access is denied. If they all match, it will go straight to the quiz selection page.

The quiz selection page allows the students to choose which quiz they would like to take. It is important that the correct quiz is selected because of the PHP sessions. If the student tried to go back and selects a different quiz or quizzes, they will be unable to until they exit the browser. Exiting the browser clears the $_SESSION[] variables and the student will have to log in to the system and start over. This page also has the start_session() function at the top of the page because the quiz number will be stored in a $_SESSION[] variable and later, submitted into the database.

Once the user takes the quiz, they will be guided to a page that basically displays all of the $_SESSION variables. The code is pretty simple. It is mainly PHP that will "echo" the HTML and the $_SESSION[] variables. Echo is a function that prints to the screen. While thanking the user for taking the quiz, it will display their score and the current time. The user will also be able to click on 'Logout' to logout of the session.

Once the user has clicked on "Logout", they are taken to a page that tells the user they have successfully logged out and displays a link going back to the home page. In the code, all of the $_SESSION variables will be "deleted" which means that all of the session ids and the data stored in the variables will be deleted.

3.3   Database Manager Interface

The two manager interfaces were made using PHP coding to access a database with MySQL and return information in HTML to be displayed. The interfaces are the Quiz Creator and the Student's data interfaces. Forms are set up in HTML for the manager to input data. This data is read in and given to the PHP code, which interprets the data. The PHP code puts the necessary data into long character strings and command words (i.e. 'SELECT' or 'INSERT INTO'). These long strings are sent to MySQL. MySQL then accesses and/or manipulate the database. Retrieved information, if any, is given back to

the PHP code and put in a string array. This array is displayed using PHP, echoing out strings to the HTML to be displayed.

At the main page of the student's data interface there are several options. The manager can: Create Database, Delete Database, Add Section, Delete Section, Add Entry, Delete Entry, Edit Entry, and View Entries. Each of these is in their own PHP file.

Create Database will only need to be pressed once unless the database is erased. This will set up the tables needed for storing the student's quiz data without any input. In the code there is a CREATE TABLE command in string form that is sent to MySQL through a mysql_query() command. The table will be created with 4 information columns of: Login, Quiz Number, Grade, and Time. The Delete Database will completely wipe the student's quiz data, allowing the manager to start from scratch. In order to make any addition the manager will need to click the Create Database button again.

A Section allows the manager to organize the students anyway needed. Each section will be its own table. Add Section takes an input of what the section is to be named. A table will be created with 3 information columns Login, Name, and Password. The Delete Section will take one input, the name of the section to be deleted. This allows the manager to delete a section without affecting the other sections.

Within each section there can be many entries. The manager can add, delete and edit the entries in a given section. Add Entry takes the four inputs of, Section, User Name, Login Name, and Password. This information is organized into a string with an INSERT INTO command and that string is sent to MySQL to insert the data into the specified section. Delete Entry will take out an entry and data without affecting anything else in the section using a DELETE FROM command. Edit Entry has two inputs, Section and Login. The button will open a new page with a display of all the quizzes and information of the login inputted. From there, the manager can change any data of a specific student's information through more form inputs. All changed information will send an INSERT INTO command that has a specified WHERE clause.

View Entries allows the viewing of one or many entries. The corresponding data of each entry can be seen based on search inputs. The sql statement is created with logic and combining the strings to produce a SELECT command. The result from the mysql_query() is put into an HTML table to be displayed.

The Quiz Creator interface also has many options. The manager can: Create Quizzes Table, Delete Quizzes Table, Add a Question, Delete a Question, Delete a Quiz and all of its Questions, and both View and Edit a Quiz and its questions. Each of these is also in their own PHP file.

The MySQL commands are very similar to the commands for the Student's Data.

Create Quizzes and Delete Quizzes create and delete the table that will hold all quizzes and their questions and answers. The table has seven columns: Quiz Number, Question Number, Question, Answer1, Answer2, Answer3, and Answer4.

Add a Question takes the same seven column inputs and puts them into the quizzes table. Remove a question takes two inputs of Quiz Number and Question Number and deletes just that question, leaving the rest of the information untouched. Delete a Quiz and all of its questions takes one input of Quiz Number and deletes all of the questions that belong to that quiz.

The View and Edit button will open a new screen. This page will show different quizzes based on quiz and question numbers. Logic signs can also be used to further sort the data (ie. >, <, !=). Once the manager views the data they can change any of the same seven data values after giving the original quiz and question number that is to be changed.

These two main pages and all the pages connected to them will help the manager quickly and easily update, change, and view all the information needed.

4.   Future Work

To target the activities more towards the high school students, including a help pop-up at the beginning of each game would increase the clarity of each game. This will allow the students to read the help if needed with the intention of having a better understanding of the games. Overall, the ideas behind the four activities are useful but to make them more user friendly for the students, some slight changes are necessary.

4.1   Factor Label Method

A calculate button could be added to calculate the answer since Mr. Dusto's main concern is that his students understand how to do unit conversions. There could also be more conversions added to the bottom of the page and the activity could check to see if the correct conversion is entered. Another possibility is adding more questions for practice or perhaps using a random variable to generate a new question each time the activity is played. These changes can be seen and are labeled in Figure 12.
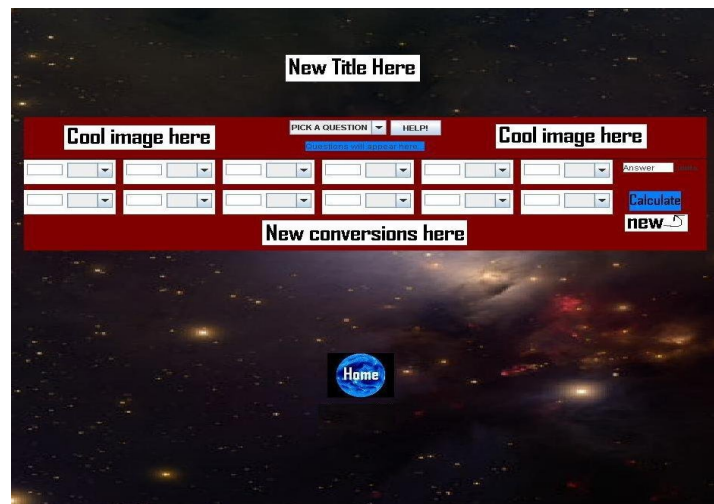

Figure 12: Factor Label Method

4.2   Kinematic Car

This activity shows the relationship between position, velocity, and acceleration. An idea to make this activity more challenging could be to add more challenges to test the student's knowledge. The extra challenges would execute similar to the other challenges already included in the game. The graphs also need to be restructured to show the x and y-axis more clearly with units for a clearer picture of the correspondence between position, velocity, and acceleration. This is shown in Figure 13.

Figure 13: Kinematic Car

4.3   Gravity Commander

Overall, this is a good activity for students. It allows them to become more familiar with the force equation. As already mentioned for all of the games, a help pop-up menu displayed when the activity is selected to better explain the purpose could be useful. It is difficult to understand that the calculation thrust button corresponds to the force display area. The activate radar button corresponds to the radius display area and so on. A help pop-up menu could easily explain this as shown in Figure 14.

Figure 14: Gravity Commander

4.4   Planet Mass

This activity shows the high school students how to find the mass of Jupiter by using the mass equation. It goes through the equation step by step but it would be helpful to include a summary that will pop up at the beginning as shown in Figure 15. Having the summary come first will allow the students to have a better understanding of what the idea is behind this activity.
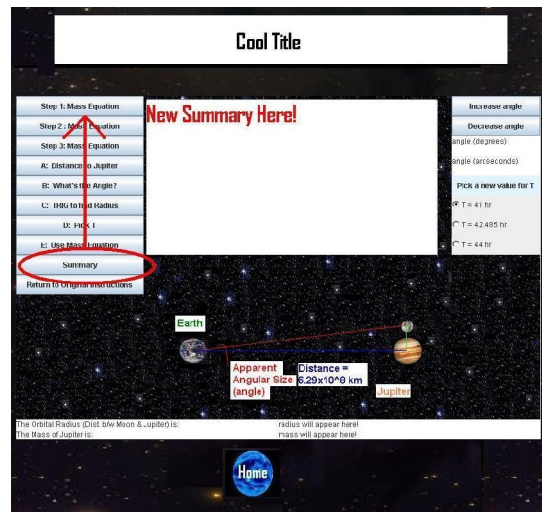

Figure 15: Planet Mass

4.5   Definition Matching

An idea for an activity that could be useful in testing the student's knowledge of the words and definitions they learn in Mr. Dusto's class is a matching activity. The words could be located on the left side of the page and the definitions jumbled on the right revealed in Figure 16. The students would have to match the words with their correct definitions. This could also give the students practice learning the periodic table of

elements and what symbol they correspond to. This would be useful for preparation for the quizzes and tests that Mr. Dusto gives in class or on graded quizzes on the website.
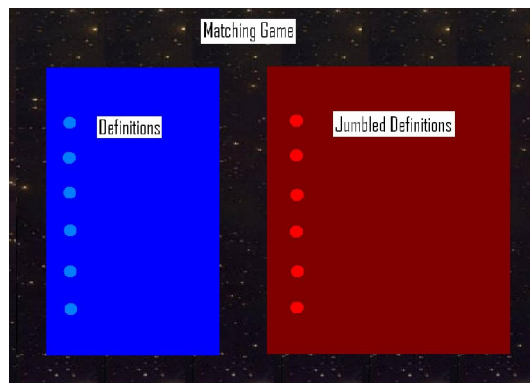

Figure 16: Matching Game

5. Concluding Remarks
5.1 Lessons Learned

- The different browsers each have their own set of guidelines that have to be addressed. These change the outcome of the site depending on which one is being used. Internet Explorer needs extra support in order to use pop-up or pull-out menus and Mozilla is especially specific with syntax.

- Team work and time management is extremely important when trying to create a finished product.

- PHP, MySQL, HTML, CSS, and JavaScript all had to be learned in order to successfully finish this project.

- Frames are very difficult to use in different browsers because different settings can be placed for each different browser, thus making it extremely difficult to view a site with frames. The positive side of frames is that it is possible to have a link in one frame open up in a different frame. Tables do not have this support. Although, this is true, tables were used so that all students will be able to access everything on the site.

- If the cookie support is turned off then cookies do not work. Therefore it is a better idea to use PHP sessions.

5.2 Conclusion

The final website contains all of the final products. The items that have been changed are the appearance, adding chemistry, adding graded quizzes, login system, database system, and organization of the files. All of which will serve to help the students understand the main concepts of physical science and chemistry. The quizzes were updated to contain the new visual appearance. Graded quizzes were added for Mr. Dusto to assign quizzes as

an assignment, and in order to keep track of these quizzes, a login and database system were added to the site. The organization of the entire site was reconstructed and has made the site much easier to use and understand. Although, the activities were unable to be updated, the site still executes smoothly and runs to the specifications required. The final website is attractive to students and easy to navigate. The client is able to use and maintain the site. It is now more helpful for his students.

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