

**ChemTeacher**: *An Online Resource for Chemistry Teachers from ChemEd DL.*

Part 1: Quick Guide

Part 2: Extended Guide

with Itemized Instructions

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Quick Guide to **ChemTeacher**: *An Online Resource for Chemistry Teachers from ChemEd DL.*

**About:** ChemTeacher is a resource library for high school chemistry teachers that presents resources in a logical format that makes it easy for individual teachers to incorporate into lesson plans and curriculum and easy to access in the classroom. ChemTeacher organizes resources by topic. This is not a prescribed curriculum. This is not a pre-planned lesson. Teachers still need to use their own skill in determining when, how, and what to use.

**What types of resources:** ChemTeacher contains the following main resource types:

- · Videos (of reactions)
- · Demonstration
- · Computer simulations
- · Historical Background
- · Real World Applications
- · Vocabulary

**VIDEOS:** Good videos show reactions, especially that cannot easily/safely be done in the classroom

- · Under a minute and a half
- · Professional (not some kid in his parents' garage, not shakey filming)
- · Focus on a single reaction
- · High resolution
- · Include the balanced chemical equation!

Videos can come from many places, even YouTube. Always check first in Chemistry Comes Alive!, another ChemEd DL project.

[LINK URL:

[http://www.chemeddl.org/alfresco/service/org/chemeddl/ttoc/ttoc\\_individual?ID=wiki.chemprime.chemeddl.org&guest=true](http://www.chemeddl.org/alfresco/service/org/chemeddl/ttoc/ttoc_individual?ID=wiki.chemprime.chemeddl.org&guest=true)]

>> Click into a topic, look up videos, and when you get to the actual video page, go to the bottom, where it says “ChemPRIME/MediaWiki” and copy the number in the box. (eg. **vid:5753**)

**DEMONSTRATIONS:** Demonstrations can be used either by the teacher in the front of the classroom or by the students as a type of lab.

- · Test them out yourself (ask Betty Moore about this) to take **pictures** and get **tips** for other teachers.
- · Should be short and easy to set up.
- · Should be absolutely specific about how to prepare and how to conduct. Teachers don't have to do guess work.
- · Safety instructions
- · How to reset between classes, how to dispose
- · Include the balanced chemical equation!

**COMPUTER RESOURCES:** Either interactive simulators or pre-animated simulations that illustrate a concept, either for a teacher to show in front of the class or for students to work on as an in-class exploration.

Computer resources can come from a variety of sources. Always check ChemEd DL first, especially for things like Models360 and PTL! Also, always check comPADRE and CSERD, two partner groups with sites similar to ChemEd DL. (Physics and computer science, respectively.)

[LINK URL: <http://www.shodor.org/refdesk/>]

[LINK URL: <http://www.compadre.org/>]

**HISTORICAL BACKGROUND:** Historical background is for teachers and students to understand how certain scientific discoveries came to be. Often time, understanding the human aspect of science and how someone discovered a concept makes it significantly easier for students to accept, learn, and remember.

**REQUIRED.**

are great history-of-chemistry books in the UW Chemistry Library.

**CITATIONS**

There

**REAL WORLD APPLICATIONS:** Real-world situations that rely on the main concept being discussed. Write out full sentences with explanations, and link to pictures if possible. (Example: Helium balloons float because helium gas is less dense than the surrounding air, and more dense gases always go downward.)

**VOCABULARY:** Vocabulary related to this concept. Teachers might use it to ask good questions during class, homework, or tests. Students might use these in papers or to know what topic a question is asking.

- · Term
- · Definition (stored in the glossary)
- · Use in a contextual sentence related to the topic

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Extended Guide to **ChemTeacher**: *An Online Resource for Chemistry Teachers from ChemEd DL.*

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## 1. General – Creating Pages

### a. Abstracts

In a world where time is precious and professionals have a heavy pack of responsibilities, there is a need for educational resources to be provided with simple accessibility; resources must be made available in a compact and unified Internet package. Research was collected in subject matter and varying levels of education and curricula. Demonstrations were sought, tested, and adjusted to be more effective. The content was combined in a custom web site, using the Joomla! content management system as a framework. The resources contained within ChemTeacher are available for teachers in secondary chemistry and are best suited for less-experienced teachers, including substitute teachers. The content can be adjusted for several levels of study, ranging from general science to Advanced Placement. Demonstrations cross several different budget and experience limits, ranging from household materials to stockroom chemicals. This project should facilitate the access of teachers to quality resources to positively enhance a students learning experience and the general instruction of chemistry.

ChemTeacher is a compact, unified internet package that links to online teaching and learning materials for specific topics in the high school chemistry curriculum. Resources have been vetted to be scientifically accurate, pedagogically defensible, and easily accessible, usually at the click of a single button. Whether a new teacher, substitute teacher, or long-seasoned teacher in new circumstances, any educator will be able to use ChemTeacher to strip time away from search engines and resource codices and reinvest that time for efficient lesson planning, effective instruction, and meaningful assessment. A teacher can select the level appropriate for a class, and the resources provided can be implemented in whatever way the instructor chooses.

### b. Creating Pages

All topics are saved in “articles,” which are part of the “Content” program in ChemTeacher.

To add a new topic/article:

1. Log in to the Administrator section of ChemTeacher.
2. Go to Content -> Article Manager.
3. Click New.
4. Select the *Section* and *Category* for your article. (You may have to create or enable the section or category as well, which you can also do from the Content menu.)
5. Choose a *Title*.
6. Most pages will follow the standard format of ChemTeacher (history, definition, videos, demonstrations, etc.). To open an article with the standard format, type “{ model}” (curly braces around “model”) into your new article.
7. Apply. Now you should see the article with the appropriate boxes for all of the content.

Whenever you finish adding content, add each paragraph to the GoogleDocs page for editing, along with your name and date.

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## 2. VIDEOS

### a. Finding Videos

Videos can come from anywhere. The best video is under 90 seconds and is professional. (No camera shake, done in a lab, not in a garage, etc.) Ideally, the video has no swearing and no drug/alcohol/tobacco references.

Videos should generally focus on a single reaction or change. Too much, and it will be hard for students (or the teacher) to tell what the purpose is. All videos need a purpose! It should be obvious from the video or from the description you write that the video belongs to that topic.

Other types of videos are songs to learn a topic or additional teaching help for the topic. These might be longer. Think of them as something a teacher can ask students to do on their own, for example.

You can find videos from YouTube or anywhere in a QuickTime or Windows Media format.

#### **When you find a YouTube video, you need:**

- · Title
- · Long Link (from the YouTube SHARE button below the video)
- · Uploaded by (this will be the *Contributor* when you enter it into CT)
- · Date Uploaded (*Date Created*)

#### **When you find any other type of video:**

- · Format (QuickTime or Windows Media)

- · Movie URL (for the actual movie-will end in .mpg, .mov, avi, wmv, et cetera)
- · Still-Image URL (an image, usually from the same page as the movie file, with a single frame from the video that users can see before they click "PLAY")
- · Publisher (University, Company, etc.)
- · Contributor (person who made the video)
- · Date Created
- · URL of the page where you found the video
- · Copyright/Creative Commons license (whatever use license)

### b. Adding to ChemTeacher

1. To add a video, go to Videos on the left menu. You must be logged in.
2. Click New Video.
3. Select the articles that will show the video in the top blue box. Make sure to click Add Article  
You can add as many as you would like.
4. Choose the *Tag* for the movie (which format).
5. Enter the *Title*, *Movie URL*, and *Poster Image URL* that you found above in **1-a**.
6. For description, add a short description. You must include a balanced chemical equation for any reaction in the video.
7. Enter the *Metadata*.
  1. *Publisher* will be the company or "YouTube"
  2. *Contributor* will be the person who created the video or the YouTube user who uploaded it.
  3. *Source* is the URL of wherever you found that video or "YouTube"
  4. *Rights and Licensing* is how the material is owned. Look at the bottom of a page for this or at the site's About page or Terms and Licensing page or Terms of Use page to find out exactly.
  5. *Access Rights* is how you got the video. YouTube videos, for example, are free access. You did not have to log into YouTube to use the video.
  6. *Intended Audience* is the appropriate age for the video.
  7. *Chemical Domain* is what field of chemistry. There are fields for "Demonstration" and "Public Understanding"
  8. *Educational Format* is what type of video you found. Usually, this will be "Multimedia-Based Learning"
  9. *Related Elements* if there are any specific elements mentioned / used in the video.
  10. *Resource Type* will usually be "Movie/Animation"
11. Save.

## c.□□□□□□□□ Chemistry Comes Alive!

ChemEd DL has its own video collection, called Chemistry Comes Alive! The videos are all linked to books in TIGER, which can be found from ChemEd DL homepage. If you go to a book (use ChemPRIME) in TIGER, you can click through topics, and it will come up with **## Videos**. Open any video, and scroll all the way to the bottom of the page. You will see a tab for **ChemPRIME/MediaWiki**

. You want the number inside the white text box there. Forget the and the

. You only want

**vid:####**

1. Go to Videos on the left-hand menu of ChemTeacher. You must be logged in.
2. Click New CCA! Video.
3. Select the articles that will show the video in the top blue box. Make sure to click Add Article

You can add as many as you would like.

4. Enter the *Title*.
5. Enter the *Video ID* from TIGER. (**vid:####**) [*Folder Structure* is for an outdated system, but you can still use it to find videos. If you cannot find videos in TIGER, you can try using the old CCA! Write for link.]
6. Enter a *Description*. Usually, CCA! videos have captions, but not balanced chemical equations. Add a balanced chemical equation for any reaction in the video.
7. Save.

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## 3. DEMONSTRATIONS

### a.□□□□□□□□ Writing Demonstrations

Demonstrations should have as few steps as possible. Demonstrations should highlight one concept very well, or students will get distracted. Even with one concept, it is sometimes helpful to call attention to the main point of the demo.

Demonstrations are hard for several reasons. First, all schools have different budgets and supplies in terms of lab equipment and stock chemicals. Second, demonstrations can be used for the sake of a cool performance, rather than one students can relate to and understand. It is always better to find demonstrations that use every-day objects or chemicals or demonstrations with a story or idea related to every-day life. (i.e. Kitchen spices for acid-base indicators, etc.)

Some demonstrations can also be effective labs for the whole class. This depends on safety, length, and a number of other factors between the author and the teacher.

All instructions have to be **very specific!!** There should be separate instructions for

- · Initial set-up. Give exact directions to prepare any solutions needed. Teachers do not want to spend the time crunching numbers to make a simple solution. What equipment should be taken out? How should equipment be set up to make it easiest to use during the performance? How much solution is needed? Should students be warned about safety before the day of the demonstration?
- · Performance. How to do the demonstration. This is the part in front of the class.
- · Reset. What to do between classes for the same demonstration. How do you close up the previous demonstration and get it ready for the next?
- · Clean-up. After all the classes have seen the demonstration, what does the teacher need to do to clean up? Are there any special disposal guidelines for any of the chemicals?

Demos and labs also need **very specific** safety rules and lists of equipment and materials.

Always try having a non-science college/adult friend (i.e. your average substitute teacher) read the directions to make sure you are not missing steps you do in your head.

It is better to try the demo yourself as many times as you need to get it right. Take notes on what works and what does not so the demo is ready for any other teacher.

The demo also needs an explanation of what is going on scientifically, both so a teacher can explain in, but also so the teacher knows how best to use it in class. Include balanced chemical equations for every part.

### **b.□□□□□□□□ Photographing Demonstrations**

Photographing demos and labs is a great way to help teachers. First, you learn by trial and error what works and what does not. Second, you have pictures for teachers to know how to set up and perform the demonstration. Third, teachers can use the pictures to build a bigger lesson.

There is a lab for ChemEd DL. Betty Moore tell you what you need to set up the lab and take pictures.

Generally, you want 1-2 good, clear pictures of the set-up and 2-3 good, clear pictures of the reactions.

Remember to make the photos professional. Use a solid background and good lighting and avoid any extraneous objects. Always wear safety goggles and gloves in the pictures, as well as any other demo-specific safety requirements. (Set a good example!)

### **c.□□□□□□□□ Adding to ChemTeacher**

1. Go to Demonstrations on the left-hand menu. You must be logged in.

2. Click Add New Demo.

3. Select the articles that will show the video in the top blue box. Make sure to click Add Article

You can add as many as you would like.

4. Enter a *Title*.

5. Upload a main photo to represent the whole demonstration.

6. Enter a *Description*. This is a background and summary of the demonstration.

7. Enter *Usage*, which can be notes like “Best done when...” or “Can be used as...”, for instance. Here is where you can indicate if the procedure can be safely done as a student lab.

8. Upload up to four additional pictures.

9. Add *Safety* information, including any non-standard material handling guidelines. It is always good to put “Safety goggles and gloves should be worn at all times.” Never think it is “obvious.” Also, if something requires any special permits to have in school, that needs to be specified. If there are any chemicals that are safe to handle, but require immediate attention on skin, eyes, or ingested, you should list that here so a teacher knows. (In that case, you might include a link to MSDS.)

10. Add *Equipment*. This is generally labware and any supplies that are reusable from year to year, as well as any disposable containers and the like.

11. Add *Materials*. These are generally your stock chemicals and any disposable substances used in the reaction.

12. Type the *Procedure*. Be as painstakingly specific as you can. Teachers cannot fill in the blanks. Make a non-science adult read these to see if they have any questions about clarification.

13. Enter *Notes*. This should include a review of the concepts playing into the reaction and any balanced chemical equations for the reaction. This could also have links to additional reading, for instance.

14. Enter *Disposal* instructions. How do you dispose of each of the materials, etc.

15. Enter demonstration information, such as *Difficulty*, *Preparation Time* (how long does it take to set up before you demo),

*Demonstration Time*

(how long does it actually take to do the demo),

*Availability of Materials*

,  
*Cost of Materials*

(estimate or look up typical stockroom prices online).

16. Enter the *Metadata*.

1. *Publisher* will be the company or web site where you found the demo.

2. *Contributor* will be the person who wrote the demo.

3. *Source* is the URL of wherever you found that demo.

4. *Rights and Licensing* is how the material is owned. Look at the bottom of a page for this or at the site’s About page or Terms and Licensing page or Terms of Use page to find out exactly.

5. *Access Rights* is how you got the demo. If you did not have to log in, it is “Free Access.”

6. *Intended Audience* is the appropriate age for the demonstration.
7. *Chemical Domain* is what field of chemistry. There are fields for “Demonstration” and “Public Understanding”
8. *Educational Format* is what type of demo you found.
9. *Related Elements* if there are any specific elements mentioned / used in the demonstration.
10. *Resource Type* will usually be “Demonstration”
  
11. Submit.

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## 4. COMPUTER RESOURCES

### a. Finding Computer Resources

Good computer resources could come from anywhere. Always check first in comPADRE (physics and astronomy) and CSERD (computer science).

[LINK URL: <http://www.shodor.org/refdesk/>]

[LINK URL: <http://www.compadre.org/>]

Check ChemEd DL resources also. You can find molecules in Models360, for instance, that enable you to highlight any one of numerous concepts in molecular structures.

Resources could be animations, where you just put it up on the screen, and it shows (usually, a particle model of) some chemical idea.

Resources can be interactive simulators, where students and teachers can press buttons and change whatever is going on within the simulation.

Resources can also be walk-through interactive lessons, where students see animated models and answer questions about the concept being simulated.

There are three important factors for any computer resource. Always test it out.

1. **It works!** Resources need to work every time. Do they work on every computer and in every browser? Some schools have web stations, so it would have to work in the browser, not a download. Do you need any extra software or plugins?

2. **It is easy to use!** Either the resource comes with its own clear instructions or it would be easy enough for a student (and certainly a teacher!) to figure out how to use. If it is too complicated with too many poorly labeled buttons, the focus is not on learning a concept, but on how good students are at guessing which buttons to push.

3. **It is scientifically accurate!** No resource is good if it is not correct on some real level. (No model can be 100% correct, by definition.) But if the simulation says one thing but looks like another, this just confuses everyone.

### b.□□□□□□□□ Adding to ChemTeacher

1. Go to Computer Resources on the left-hand menu. You must be logged in.
2. Click Add Resource.
3. Select the articles that will show the video in the top blue box. Make sure to click Add Article

You can add as many as you would like.

4. Enter *Title*.
5. Leave the box *Add to ChemEd DL Database?* Unchecked.
6. For *Pathway*, you can add the name of the Pathway (comPADRE or CSERD) where you found the resource. Also add the URL to the landing page (the page you get from the comPADRE or CSERD search before you get to the final resource.)
7. Enter the *URL*.
8. Enter a *Description*.
9. Enter the *Metadata*. From other Pathways, most of this information can be found on the Pathway landing page.
  1. *Publisher* will be the company or web site where you found the resource.
  2. *Contributor* will be the person who wrote/programmed the resource.
  3. *Source* is the URL of wherever you found that resource.
  4. *Rights and Licensing* is how the material is owned. Look at the bottom of a page for this or at the site's About page or Terms and Licensing page or Terms of Use page to find out exactly.
  5. *Access Rights* is how you got the resource. If you did not have to log in, it is "Free Access."
  6. *Intended Audience* is the appropriate age for the resource.
  7. *Chemical Domain* is what field of chemistry. There are fields for "Demonstration" and "Public Understanding"
  8. *Educational Format* is what type of resource you found.
  9. *Related Elements* if there are any specific elements mentioned / used in the resource.
  10. *Resource Type* will usually be "Movie/Animation"
11. Save.
12. You will not see your resource appear automatically! It needs to be approved by Gerad or a Super-Admin.

### c.□□□□□□□□ Adding Worksheets for Computer Resources

Once you have added a resource, and it is approved, you can go back to add files, like instruction sheets, worksheets, answer sheets, and the like.

1. Go to any computer resource page. (Not Edit, but just the static page.)
2. Click Add File.
3. You need a *Title*.
4. You can upload any PDF, Word Document (DOC or DOCX).
5. Save.

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## 5. HISTORICAL BACKGROUND

Historical background is about the discoverer/developer. Specifically:

- · How was the concept discovered? (What experiments led to the discovery?)
- · What are the main points of the discoverer's life? (What could have influenced this discovery?)
- · Other important general facts about the discoverer.
- · Social context of the time of the discovery.

For example, Robert Boyle (Boyle's Law) was a colleague of Robert Hooke (Hooke's Law of Ideal Springs). He worked with Hooke to envision gas particles like springs, which influenced his own development of Boyle's Law.

Historical background also includes how this discovery was used to influence other scientists' work and other socio-political events since the discovery. (Not Real World Application, which is ideas, but specific events and scientists.)

Historical background is very useful for teachers and students. Often, it is difficult to learn science because it is taught from a sterile perspective, rather than the (true) human perspective of discovery and investigation. Ideally, if students see what led scientists to their conclusions, they will be easier to accept and internalize.

Historical background should be researched and appropriately cited. It is best to create superscript numbers for end-notes and cite the sources in the Works Cited section at the bottom.

It is immaterial what *official* citation format you use, as long as it is consistent.

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## 6. CONCEPT DEFINITIONS

Concept definitions are the exact definitions of the concept being covered.

There are generally four levels to any definition.

1. General Science – middle school or introductory high school science class. This is a simple-English definition that conveys the basic concepts without going too much in depth.
2. Basic – introductory high school chemistry class. This is a simple-English definition that conveys a more complete understanding of the concept.
3. Advanced – advanced, AP, IB class, or even an introductory college course. This is a technical definition, perhaps as it would appear in the textbooks or the scientist's own writing.
4. Mathematical – all levels. This is any formulas and mathematical (symbolic) representations of the concept.

You can also add any background knowledge, such as numerical constants, qualifying criteria, e.g. for ideal systems.

The definitions are for students to learn and review, as well as to help teachers determine their own phrasing.

Check in textbooks for each level to see how they describe the concept.

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## 7. REAL-WORLD APPLICATIONS

Real-world applications are any common interactions that rely primarily on the concept of the page. Students and teachers both depend on these applications to answer the question, “Why do we need to learn this?” as well as to further a native understanding of the topic.

Real-world applications usually have two parts. First, identify the common process or interaction using a full sentence. Then, briefly explain what part of that interaction uses the concept of the page, also in full sentences.

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## 8. VOCABULARY

### a. Adding a Vocabulary Table

Vocabulary is important for scientists to be able to discuss and share effectively. Vocabulary for a topic should represent common questions or statements about that topic, indicators that a question asks about a particular topic, or related vocabulary that might be used near the vocabulary from this concept.

1. Go to the article for the concept you want to edit.
2. Click the Edit icon.
3. Go to the vocabulary box.
4. Click the button Start Vocabulary Table | ABC.
5. Each row is one term. Left is the term. Right is a sentence or question using that term in the context of the concept of the page.

### b. Adding Glossary Terms

1. Go to Glossary on the left-hand menu. You must be logged in.
2. Click Add a new entry.
3. Enter the *Term* and *Definition*. Definitions can be gotten in a formal dictionary, such as dictionary.com (cite the dictionary source dictionary.com cites). You do not need any other information there. You may need to select one best definition or re-word it to match the chemistry usage.
4. Submit.

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## 9. SAMPLE QUESTIONS

Sample questions are managed through a program called Moodle, which is run by ChemEd DL. There are two sources of sample questions. First is QBank, the ChemEd DL set of questions already in place. These are available through TIGER. The second type is questions a ChemTeacher user adds separately. These questions can be used for teachers to lead discussion in class, write homework and test questions, and help students review. Students use these questions to prepare for tests and to review material.

To add new questions to ChemTeacher:

1. Go to Moodle ([moodle.chemeddl.org](http://moodle.chemeddl.org)) and log in.
2. Go to the ChemTeacher course. (You must get prior approval to add content here.)
3. Go to Questions on the Administration menu on the left.
4. Create new question.
5. Construct the question and Save changes. You should see your new question appear in the question list in Moodle.
6. Click the Magnifying Glass icon to preview the question.
7. Copy the URL of the question preview.

To add questions from ChemEd DL QBank:

ChemEd DL has its own question collection, called QBank. The questions are all linked to books in TIGER, which can be found from ChemEd DL homepage. If you go to a book (use ChemPRIME) in TIGER, you can click through topics, and it will come up with **## Assessment**

### Question

. Open any question, and click through until you are on the Moodle page that shows the whole question and the buttons to

Submit

. Copy the URL of this question preview.

All Questions:

1. Go to Sample Questions in ChemTeacher on the left-hand menu. You must be logged in here, too.

2. Click New Question.

3. Enter a *Title*.

4. Paste the URL from above (the question-preview URL).

5. Select the articles that will show the video in the top blue box. Make sure to click Add Article

You can add as many as you would like.

6. Save.

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## 10. MATHEMATICAL/CHEMICAL EQUATIONS

ChemTeacher has a method to add chemical and mathematical equations, using a system called TeX (“tek”). Formulas are entered using words and codes, and then they are parsed into image files on-the-fly.

[LINK URL: <http://en.wikipedia.org/wiki/Help>] :Displaying\_a\_formula has all of the codes you need to write equations and formulas.

Within ChemTeacher, any editing box will allow you to enter a formula. Just type `.` (That is curly braces around `tex` and `/tex`.)

For chemical symbols, make sure to include them in `text{ }` so they come out with block print, as opposed to italics.

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## 11. IMAGES/PHOTOS

Images and photos are great for added context to lesson pages. However, there are issues with ownership and usage rights. Therefore, there are two different rules for pictures.

1) Photos licensed under Creative Commons may be used directly on ChemTeacher. You may download the file and upload it to ChemTeacher, or you may just use the URL.

1. Log in to the Administrator section of ChemTeacher.

2. Go to Content -> Article Manager.
3. Click New.
4. Set the *Section* to "Images" and the *Category* to the section title where you want to use the photo. (If I want to use the photo in Gases -> Gas Laws -> Boyle's Law, my *Category* will be "Gases".)
5. *Title* the image.
6. Click the Photo button:
7. For URL: Copy-paste the URL of the image from its original site to *URL*.  
For downloaded images: Click the Upload button to select and upload the picture. Once the picture is uploaded, choose it from the list.
8. Add *Alternate Text*, which is a title or caption.
9. Insert.
10. Type the source of the photo and that it was available under Creative Commons. (This is a REQUIREMENT!)
11. Save.
12. Go to the article where you want to include the picture.
13. In any text area, type the title of the photo where you want the link.
14. Highlight the title.
15. Click the Link button.
16. Open the "Content" menu of the link box.
17. Go to the "Images" section and find your photo article.
18. Insert.
19. Save.

2) Photos that are Copyrighted or any other reserved rights can only be used by linking to the original site.

1. Go to the article where you want to include the picture.
2. In any text area, type the title of the photo where you want the link.
3. Highlight the title.
4. Click the Link button.
5. Enter the *URL* of the original web page (not just the original photo image file!).
6. Insert.
7. Save.

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## 12. LINKED STANDARDS

There is a system in place to link articles to state and national science content standards. The standards are the body of understandings and skills adopted as the minimum requirement for students to learn, and they are intended mostly as a jumping-off point for districts and states to make curricula.

Adding Standards:

1. Log in to the Administrator section of ChemTeacher.
2. Go to Components -> Custom Properties -> Manage Custom Properties.
3. For new standard groups (a new document of national standards, a new state standard set, etc.), click .
4. To add individual standards to a group/document, click on the title of the group you want.
5. You can use Add Value to add an additional standard. (The *Name/Value* should be the code number the standard document uses. The *Label* should be the actual text the standard document uses.
6. Save.

Assigning Standards:

1. Log in to the Administrator section of ChemTeacher.
2. Go to Components -> Custom Properties -> Assign Custom Properties.
3. Hold down the Control key (PC) or the Command key (Mac) and select the standards from the right side you want assigned to that article.
4. Check the article you want to assign standards.
5. Add (Adds the selected standards to those articles) or Replace (changes all of the standards for that article to the ones selected).

