**Chemistry WebQuest**

**Six Major Types of Chemical Reactions**

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| **Introduction**: It’s all about the electrons!  You have learned that valence electrons are responsible for most of the chemical characteristics of different elements and molecules. You also know that bonds are created by the sharing or transfer of valence electrons between atoms. But what really happens when electrons move around? What happens when bonds are made, broken, or reformed? In what different ways can molecules interact with each other and react?    In the following WebQuest, you will use teamwork to learn all about the six major types of chemical reactions. Each person in the class will become an expert on one reaction type, and then you will come together at the end to share and get a better understanding of the topic as a whole. |  |

**Procedures**

 Each student in class will be assigned a reaction type so that the class will be divided into 6 groups. Students will then use the links provided as well as other resources (library, etc) to become experts on their reaction type. Each student should be ready and able to contribute their expertise to the greater understanding of the entire class by way of a presentation.

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| After your group has completed the WebQuest, you are now ready to teach the rest of the class what you know. Each group will use their newfound knowledge to create an instructional presentation on their designated type of chemical reaction. The presentation must include some type of technology-based audio/visual aid, such as a PowerPoint presentation, a Macromedia Flash show, or a video. | j0195384 |

 Each presentation must include the following:

* name of your reaction type
* a generic equation
* some real-life examples of the reaction type
* an appropriate social analogy to describe what is happening in the reaction type

Presentations should be 5-8 minutes long max. and all sources should be appropriately annotated. You should carefully read the **grading rubric** for the presentation before you start working, and refer to it as often as needed while you progress toward the finished product.

After completing this WebQuest, you should have achieved the following goals:

* develop an interest in the study of Chemical Reactions;
* use the power of the internet to make an in-depth exploration of a topic in chemistry;
* learn information about key aspects of the six types of chemical reactions;
* explain how each type of chemical reaction impacts human life;
* create a multimedia presentation to present your newly acquired knowledge to your classmates.

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|  | **What do I do on a WebQuest?**  You will be working in your groups exploring different websites related to chemical reactions. Some of the sites give background information on different types of chemical reactions, others describe real-life examples, and still others show demonstrations involving the different reactions. |

**Part 1 – Background Research**

These sites provide basic information about chemical reactions. Everyone should explore these sites before starting your group work.

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| [\* Chemical Reactions: The Basics](http://www.chem4kids.com/files/react_intro.html)    [\* Chemical Reactions: High School Notes](http://www.woodrow.org/teachers/chemistry/links/chem1/Chapter8.html)    [\* Chemical Reactions: More In-depth](http://www.visionlearning.com/library/module_viewer.php?mid=54)    [\* For Fun: The Elements Song](http://www.privatehand.com/flash/elements.html) |  |

**Part 2 – Individual Topics**

Each student should aspire to become an expert on their designated reaction type using the links and instructions below. Here are the general instructions for all of you. Please see your specific instructions and questions below.

**INSTRUCTIONS**:

1. Read through the webpages, attached files, and watch any of the relevant videos and demonstrations. You are not limited to the given websites.

1. Include the URL of the page you take information from so you can return to it and use it as a citation.

Topic A: Synthesis (Combination) Reactions

[\* Video -The Synthesis of Water](http://www.science-tube.com/index.php?c=chemie&section=015) (explosively! from hydrogen and oxygen gases)

[\* Video– Reaction of Aluminum and Bromine](http://www.science-tube.com/index.php?c=chemie&section=037)

[\* ChemTeam: Synthesis](http://dbhs.wvusd.k12.ca.us/webdocs/Equations/Synthesis.html)

[\*Chemical Reactions – Combination](http://www.iun.edu/~cpanhd/C101webnotes/chemical%20reactions/combination.html)

[\*Examples of Synthesis Equations](http://www.chem.vt.edu/RVGS/ACT/notes/Types_of_Equations.html#Synthesis)

[\* Video - Synthesis of MgO](http://www.youtube.com/watch?v=u89wG8qGC1Y)

Your job is to become an expert on synthesis/combination reactions. During your research, think about the following questions:

1. What is a synthesis reaction?

2. What are some real-life examples of synthesis reactions?

3. How are synthesis reactions used in our daily lives?

4. How could you describe a synthesis reaction to someone who didn't have a very good background in chemistry?

Topic B: Decomposition Reactions

[\* Video:Decomposition of Silver Oxide](http://www.science-tube.com/index.php?c=chemie&section=028)

[\*ChemTeam – Decomposition](http://dbhs.wvusd.k12.ca.us/webdocs/Equations/Decomposition.html)

[\*Chemical Reactions – Decomposition](http://www.iun.edu/~cpanhd/C101webnotes/chemical%20reactions/decomposition.html)

[\*Examples of Decomposition Equations](http://www.chem.vt.edu/RVGS/ACT/notes/Types_of_Equations.html#Decomposition)

[\* Video:Decomposition of Hydrogen Peroxide](http://www.science-tube.com/index.php?c=chemie&section=009) (with a little help from iodine!)

Your job is to become an expert on decomposition reactions. During your research, think about the following questions -

1. What is a decomposition r eaction?

2. What are some real-life examples of decomposition reactions?

3. How are decomposition reactions used in our daily lives?

4. How could you describe a decomposition reaction to someone who didn't have a very good background in chemistry?

Topic C: Single Replacement Reactions

[\*Video: Reaction of Sodium Metal with Water](http://www.theodoregray.com/PeriodicTable/Stories/011.2/Videos/SodiumParty02.html)

[\* Video:The Thermite Reaction](http://www.science-tube.com/index.php?c=chemie&section=031)

[\*ChemTeam - Single Replacement](http://dbhs.wvusd.k12.ca.us/webdocs/Equations/SingleReplacement.html)

[\*Chemical Concepts - Single Replacement (Substitution)](http://hyperphysics.phy-astr.gsu.edu/hbase/chemical/reactcon.html#c1)

[\* Video:Reaction of Magnesium Metal and Hydrochloric Acid](http://www.science-tube.com/index.php?c=chemie&section=096)

Your job is to become an expert on synthesis reactions. During your research, think about the following questions -

1. What is a single replacement Reaction?

2. What are some real-life examples of single replacement reactions?

3. How are single replacement reactions used in our daily lives?

4. How could you describe a single replacement reaction to someone who didn't have a very good back ground in chemistry?

Topic D: Double Replacement Reactions

[\* Volcano Experiment](http://www.mrstyles.co.uk/html/volcano_experiment.html)

[\* Brainiac - Fizzy TabletExperiment = NaHCO3 + Citric acid (H3C6H5O7)](http://www.youtube.com/watch?v=chFY364qWLc)

[\* ChemicalConcepts - Double Replacement (Substitution)](http://hyperphysics.phy-astr.gsu.edu/hbase/chemical/reactcon.html#c1)

[\*ChemTeam - Double Replacement](http://dbhs.wvusd.k12.ca.us/webdocs/Equations/DoubleReplacement.html)

[\* Video -Double Replacement reactions](http://www.jce.divched.org/JCESoft/CCA/samples/cca1S1047.html)

Your job is to become an expert on synthesis reactions. During your research, think about the following questions -

1. What is a double replacement Reaction?

2. What are some real-life examples of double replacement reactions?

3. How are double replacement reactions used in our daily lives?

4. How could you describe a double replacement reaction to someone who didn't have a very good background in chemistry?

Topic E: Combustion Reactions

[\* Brainiac - Burning a Candle](http://www.youtube.com/watch?v=iABASTQFkCM)

[\* ChemTeam– Combustion](http://dbhs.wvusd.k12.ca.us/webdocs/Equations/Combustion.html)

[\*Examples of Combustion Equations](http://www.chem.vt.edu/RVGS/ACT/notes/Types_of_Equations.html#Hydrocarbon)

[\*Chemical Reactions – Combustions](http://www.iun.edu/~cpanhd/C101webnotes/chemical%20reactions/combustion.html)

[\* Video: CorkRockets – The Combustion of Methanol](http://chemed.chem.purdue.edu/demos/main_pages/5.17.html)

[\* Video: Methane BubbleMonster](http://www.youtube.com/watch?v=Oh-1wOSTiP0)

[\* Ask AScientist – Why is fire hot?](http://www.ccmr.cornell.edu/education/ask/index.html?quid=57)

Your job is to become an expert on combustion reactions. During your research, think about the following questions -

1. What is a combustion reaction?

2. What are some real-life examples of combustion reactions?

3. How are combustion reactions used in our daily lives?

4. How could you describe a combustion reaction to someone who didn't have a very good background in chemistry?

Topic F: Acid-Base (Neutralization) Reactions

[\*Neutralization Reactions](http://www.marymount.k12.ny.us/marynet/stwbwk03/03hchem/emreaction/emreaction.html)

[\* Video: TheBriggs-Rauscher Oscillating Reaction](http://video.google.com/videoplay?docid=680106771263243162)

[\*ChemTeam – Properties of Acids and Bases](http://dbhs.wvusd.k12.ca.us/webdocs/AcidBase/Acid-Base-Properties.html)

[\*Chemical Reactions – Acid-Base](http://www.iun.edu/~cpanhd/C101webnotes/chemical%20reactions/acidbase.html)

[\*Video: Acid + Base = Salt + Water](http://video.google.com/videoplay?docid=8823614704374505728&q=acid+reaction&total=177&start=10&num=10&so=0&type=search&plindex=7)

[\* Video:Effects of Strong Acid and Base (Alkali)](http://www.science-tube.com/index.php?c=chemie&section=091)

Your job is to become an expert on Acid-Base reactions. During your research, think about the following questions:

1. What are acids and bases?

2. What is a neutralization reaction?

3. What are some real-life examples of acid-base reactions?

4. How are acid-base reactions used in our daily lives?

5. How could you describe an acid-base reaction to someone who didn't have a very good background in chemistry?

Presentation Evaluation (40 points)

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|  | **1-2 points** | **3-4 points** | **5-6 points** | **7-8 points** |
| **Research** | No sources or invalid sources cited | 1-2 credible cited sources | 3 credible cited sources | 4 or more credible cited sources |
| **Description of Reaction Type** | Incorrect description of reaction type; demonstrates no understanding of chemical reactions | Underdeveloped description of reaction type; demonstrates minimal understanding of chemical reactions | Developed description of reaction type; demonstrates understanding of chemical reactions | Well developed description of reaction type; demonstrates understanding of chemical reactions; outstanding use of researched sources for descriptions |
| **Validity of Corresponding Analogy** | Analogy is poorly developed and/or does not support reaction type scenario | Analogy is valid and referenced but is poorly developed | Analogy is developed, applies to all reactions of that type and supports reaction type scenario | Analogy is well developed, references and explains particular example, applies to all reactions of that type, and supports reaction type scenario |
| **Presentation and Bibliography** | Meets no criteria outlined in process | Meets few of criteria outlined in process; insufficient bibliography | Meets most to all criteria outlined in the process; bibliography format flawed | Meets all criteria outlined in the process; includes full bibliography in proper format |
| **Presentation and Responses to Questions** | Poorly prepared, unable to answer any questions clearly, some members do not participate. | Some preparation evident, answers at least one question correctly, all member of group participate | Demonstrates good preparation, answers most questions correctly, all members of group participate | Polished and professional presentation, demonstrates expertise in answering questions, all members of group participate |