

Term 2	5% of Year Assessment	Semester/Year	Semester 2 2017
Teacher	Mrs Morritt	Assessment Task 11	Chemical Reactions.

Assessment Task 11 Design Brief

Research the chemicals involved in interesting and/or useful chemical reactions suitable to demonstrate for high school students.

Theme: STEM and Research Investigation and Extended Response

Recently we saw some interesting chemical reactions demonstrated by the staff of the Chemistry Department at Murdoch University.

You may work alone, or in pairs to research and design one chemical reaction that you could demonstrate to a class of Year 7 or 8 students.

You must choose chemicals, reactions and quantities that are safe to use in a high school.

- Research the reaction, chemicals and their safety.
- Describe the reactant chemicals and explain their properties.
- Describe the chemical reaction.
- Describe the product chemicals and explain their properties.
- Discuss the energy involved.
- Justify why you chose this reaction to demonstrate.

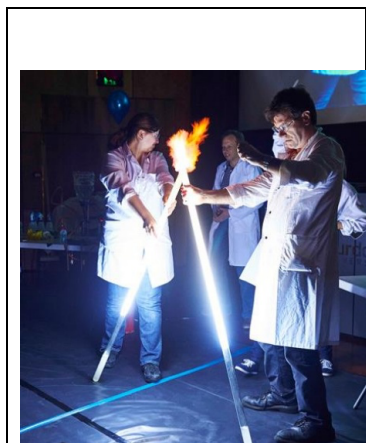


Figure 1: Chemistry Demonstration Murdoch University.

RESEARCH / DOCUMENTATION

Collaborate to complete the Task. Design and record responses on either a digital document, or in your Science Workbook.

Add your Design Team Names to the file name and upload it to Connect.

MATERIALS:

- Laptop with connection to Internet, Connect and Safety Documents.
- Link to our website with some ideas;
- This Research Task Sheet
- Big Ideas of Science Text Book
- Science Workbook

PROCESSES: Discussion, research and trialling of reactions. Keep a record on your research. Check with the teacher at each stage of the research and trialling. Submit a final Extended Response, written in formal paragraphs.

CRITERIA: The Research Task should;

1. Include headings, paragraphs, chemical word equations, balanced chemical equations, scientific drawings using a ruler and pencil, other relevant images.
2. Demonstrate a respect for the chemicals, the reaction, audience and colleagues.

TIMELINE: 5 lessons for research, trialling, writing and handing in the Task.

PRESENTATION: Written submission

Chemical reactions that could be chosen;

- Reactions of acids with metals
- Reactions of acids with bases
- Reactions of acids with carbonates
- Combustion reactions
- Metal displacement reactions
 - Iron in copper sulfate solution
 - Copper in silver nitrate solution
- Oxidation and Reduction reactions (RedOx)
 - Elephant's Toothpaste
- Making and testing gases;
 - Oxygen, hydrogen or carbon dioxide
- Flame Tests – colours for fireworks
- The Clock reaction
<http://www.rsc.org/learn-chemistry/resource/res00000744/iodine-clock-reaction?cmpid=CMP00005152>

Check with your teacher during your research and before ordering equipment.

Some of the reactions in this video are not permitted to be performed in high school.

<https://www.youtube.com/watch?v=0Bt6RPP2ANI>

1. Chemical Safety

Material Safety Data Sheets (MSDS)?

http://www.commerce.wa.gov.au/sites/default/files/atoms/files/msds_dec_07.pdf

BIS reference page 295

What information must be provided in an MSDS?

To comply with the law in Western Australia, an MSDS for a hazardous substance will describe its properties and uses, including:

- the identity of the hazardous substance eg product information to identify the hazardous substance(s) and basic information on uses;
- chemical and physical properties eg physical description including description of the mixture or formulation if applicable;
- health hazard information eg health effects from exposure and first aid information;
- precautions for use eg correct application and common uses, ventilation requirements, equipment for personal protection and information on flammability; and
- safe handling information eg safe storage in the workplace, safe transporting, dealing with spills and disposal and information for firefighting and emergency services.

- a. Go to Connect and download the MSDS and the Hazard Pictograms
- b. Research the type of chemical reaction you want to demonstrate and chose one that is safe and you think will work. Think about why it is an interesting reaction, or how you could make it interesting for your audience.
- c. Name the chemicals that are needed.
- d. Describe the properties and uses of the reactant chemicals, including the five dot points above.
- e. Describe the properties and uses of the product chemicals, including the five dot points above.

2. The Chemical Reaction and Safety

- a. Name the reaction
- b. Research and list the safety procedures for performing the reaction.
- c. Write a paragraph which clearly outlines the safety considerations of this reaction for both the presenter and the audience.

3. Description and Explanation of the Reaction.

- a. Describe the reactants, products and the progress of reaction in terms of materials and energy. This is like the Black Box model we discussed earlier. The inputs are the reactants and the energy which added to the system. The outputs are the products and the energy which are given out by the system. The Black Box is the chemical reaction.
- b. Write a chemical word equation to summarise the reaction.
- c. Use the molecular model kits to make molecules of the reactants and products. Photograph or draw them.
- d. Discuss how energy is used in this reaction.
- e. Use diagrams to help explain how the Collision Theory works in this reaction. **BIS p284 to 285**

4. Justification of the Reaction.

- a. Write three paragraphs to justify the choice of reaction that you will demonstrate to younger students. Consider your audience, safety, interest and usefulness of the reaction.

5. Note:

- a. Equipment and chemicals must be ordered at least 24 hours in advance.
- b. Appropriate safety gear and measures will be taken before conducting the reaction.
- c. Work spaces, hands and apparatus must be cleaned before the end of each session.
- d. Any waste chemicals must be disposed of in the appropriate way for that chemical.