

TITLE OF LESSON

Physical Science Unit 1 Lesson 35 – Types of Reactions

Nature of Matter: How do tribes attain understanding of chemical reactions?

TIME ESTIMATE FOR THIS LESSON

One class period

ALIGNMENT WITH STANDARDS

California – Sciences: Chem, Atomic and Molecular Structure 1; Chemical Bonds 2; Conservation of Matter and Stoichiometry 3; Investigation and Experimentation 1

MATERIALS

Sulpher – Reading from *The Periodic Table* by Primo Levi (not provided by ESubjects)

Kirinyaga, Epilogue pp. 276-287 – Reading (not provided by ESubjects)

Types of Reactions – Student Page

Types of Reactions Key – Teacher Page

Physical Science Textbook

paper

pen or pencils

LESSON OBJECTIVES

- To learn about the types of reactions
 - To create flash cards of reaction types
 - To classify types of reactions and explain your choice
 - To read independent reading materials
 - To write a journal
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FOCUS AND MOTIVATE STUDENTS

- 1) Homework Check – Collect **Chemical Reactions**. Hand back all corrected homework. Have students place it in the correct section of their binders.
 - 2) **Agenda** – Have students copy the agenda you posted.
 - 3) Read Aloud – Hand out copies of *Sulpher* or have students use their personal copies. Have the students get in their groups and **read** the story **out loud**. The students choose who will begin and then go around their group. After they finish reading the story they need to answer the following questions:
 - a) Identify the problem that Lanza ran into while working that night. *The kettle was building up pressure and it could explode.*
 - b) Identify the cause. *Lanza found that the kettle was full of foam.*
 - c) Describe how Lanza solved the problem. *He opened the valve to the suction fan, started the fan, closed the vacuum breaker and stopped the pump.*
 - d) Why do you think this solved the problem? *Answers will vary, but one answer would be that by opening the valve, he released the pressure that was building up in the kettle.*
 - e) Do they think that they may be required to solve problems in their laboratories? Why or why not? *Answers will vary, but one answer would be that if they do not follow instructions carefully, they may change the experiment or get different results. So they might have to solve this problem.*
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ACTIVITIES – INDIVIDUAL AND GROUP

1. Notes: Types of Reactions – Remind students to take good notes during today’s class. Their notes and the worksheet will be placed in the NOTES section of their binders. Tell students to title their notes, Types of Reactions

- Opening Question – Ask students “Are all chemical reactions the same? Why or why not? *No, because different substances are reacting in each case. Can we classify reactions?” yes, by the types and number of substances that react and the products they produce.*
- Graphic Organizer – Create a table on the board, filling in the first two columns. The last column will be completed later after students have come up with examples from their group work.

Type of Reaction	Equation Format	Example
Synthesis	$A + B \rightarrow AB$	$2Na + Cl_2 \rightarrow 2NaCl$
Decomposition	$AB \rightarrow A + B$	$2H_2O \rightarrow 2H_2 + O_2$
Combustion	$2A + O_2 \rightarrow 2AO$	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
Single Displacement	$AB + C \rightarrow CB + A$	$2Na + CaCl_2 \rightarrow Ca + 2NaCl$
Double Displacement	$AB + CD \rightarrow AD + CB$	$NaBr + KCl \rightarrow NaCl + KBr$

- Textbook Work/**Vocabulary** – In pairs, have students look up definitions for each type of reaction in the textbook and add the definitions to their vocabulary lists.

Synthesis Reaction – a reaction of at least two substances that forms a new, more complex compound

Decomposition Reaction – a reaction in which one compound breaks into at least two products

Combustion Reaction – a reaction in which a compound and oxygen burn

Single Displacement Reaction – a reaction in which atoms of one element take the place of atoms of another element in a compound

Double Displacement Reaction – a reaction in which a gas, a solid precipitate, or a molecular compound is formed from the apparent exchange of ions between two compounds.

Check that all students have completed the definitions.

- Group Work – Have students break into groups, assign roles (see *Group Roles* below), and create a list of examples for the table above using the equation format and finding equations previously introduced in class that represent each type of reaction.
- Class Work – After recording at least three examples for each heading, one member of each group should record the group’s examples on the board. The class should then choose an example to list in the table for each type. They may choose one that is commonly known to them or that more than one group had listed. In their notes they should list all examples so that they have a clear understanding of what constitutes each type of reaction.
- Flash Cards** – Have students make flash cards for the following types of reactions: synthesis, decomposition, combustion, single displacement, and double displacement.
- Flash Cards** – Give the students 5 minutes to study the flash cards. While they are studying their flash cards, note in your grade book those who have completed the assignment. Then have them pair up. Assign each partner a letter (partner A and B). Tell them that first all the A’s will be flashing the B’s. The correct answers will be put in one pile and the incorrect in another. Tell them they have 5 minutes. Go. At the end of five minutes call time. Record the number of correct answers in the grade book when finished. Then have the B’s flash the A’s. Give them five minutes. At the end of five minutes, call time and record the number of correct answers for each student. The goal is to increase the number correct each time they flash. Remind students that flash cards are a great studying strategy that many college students have to use in order to remember all of the information they are expected to learn.
- Group Work – Have students break into groups and work on the first ten questions of **Type of Reactions**. Tell students that they must explain why they got the answer they did, e.g. they should be able to explain that for decomposition, the compound in the reactants breaks down to form 2 or more products. Give them 10 minutes to work on the problems, then call time. Call on students to give their group’s answer and to explain why they came to the conclusion they did.

1. Homework Review – Tell students to read *Kirinyaga*, Epilogue, pp. 276-287 beginning with “After I left my son’s study I left the house and took an airbus to the park in Muthaiga, miles from my son and the neighbors who were interchangeable with him” and ending with the end of the book. Have students write [Dialectical Journal 21](#) with at least three entries. Remind students to complete weekly one-page *Kirinyaga* journal giving their opinion of the following statement from the book and supported by 3 pieces of evidence from the book:

The thing I had not realized is that a society can be a Utopia for only an instant – once it reaches a state of perfection it cannot change and still be a Utopia, and it is the nature of societies to grow and evolve. I do not know when Kirinyaga became a Utopia; the instant came and went without my noticing it.

Now I was seeking Utopia again, but this time of a more limited, more realizable nature: a Utopia for one man, a man who knew his own mind and would die before compromising. I had been misled in the past, so I was not as elated as the day we had left for Kirinyaga; being older and wiser, I felt a calm, quiet certitude rather than more vivid emotions.

HOMEWORK

- 1) Finish **Types of Reactions**.
 - 2) Read *Kirinyaga*
 - 3) Write [Dialectical Journal 21](#) with at least three entries.
 - 4) Complete weekly *Kirinyaga* Chapter 8 and write one-page journal.
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GROUP ROLES

Recorder – All students are recorders today.

Facilitator – Your job will be to keep your group focused.

Manager – Your job will be to report back to class.

DOCUMENTATION FOR PORTFOLIO

Lab Report 2
Test 1: Matter
Lab Report 3
Class Periodic Table
Lab Report 4
Test 2: Atoms and Periodicity
Lab Report 5
Test 3: Compounds