ROSEDALE ACADEMY

SNC2D 3-2: Lesson Plan

Unit 3: Making Use of Reactions	**Lesson 3-2:** Types of Reactions	**Time:** 4 hours

Key Idea: In this lesson, you will learn about the four different types of chemical reactions: synthesis, decomposition, single displacement and double displacement. We will also look at examples of these reactions including combustion and corrosion more closely.

Ministry Expectations

Chemistry: Chemical Reactions

- analyse a variety of safety and environmental issues associated with chemical reactions, including the ways in which chemical reactions can be applied to address environmental challenges;
- demonstrate an understanding of the general principles of chemical reactions, and various ways to represent them

Learning Goals and Success Criteria

Chemistry: Chemical Reactions

Science Investigation Skills

- Analyse various safety and environment issues associated with chemical reactions and their reactants and/or product(s) (C1.1)
  - I can explain the dangers of the reactants and products of some chemical reactions. (B,D)

Understanding Basic Concepts

- Describe the reactants and products of a variety of chemical reactions (C3.5)
  - I can describe a synthesis reaction. (A)
  - I can describe a decomposition reaction. (A)
  - I can classify reactions as synthesis or decomposition reactions. (A)
  - I can describe a single displacement reaction. (B)
  - I can describe a double displacement reaction. (B)
  - I can predict the products of a chemical reaction. (B)
  - I can describe corrosion. (C,D)
  - I can describe combustion. (C,D)
  - I can describe the harms of incomplete combustion. (C,D)
  - I can describe applications of combustion and corrosion. (C,D)

Materials Required

- Moodle access & Internet
- Students need electronic device

Higher Order Thinking Skills (HOTS):

- Apply an understanding of reaction types to predict products (A,B,C)
- Evaluate the safety and impact of products and reactants of chemical reactions in the real world (B,D)

Purpose: What's the point?	**Learning Activity:** What is the teacher doing?	**Teaching Scenarios & Instructional Strategies** What scenarios & methods are being used? **refer to end of doc for complete list*	**Higher Order Thinking Skill Development** What skills are students developing? **refer to end of doc for complete list*
Review and clarify previous lesson's lingering questions **(5 mins)**	Use of questioning to check for understanding [Exit Card]: ▪ Discuss Exit Card responses and provide support as needed.	Use of questioning to check for understanding ▪ Exit Card	Processing skills ▪ Reflecting on the lesson Reasoning skills ▪ Offering opinions with reasons
Hook students into the lesson **(5 mins)**	**Introducing Lesson Topics and Academic Goals** Use of Questioning to Prompt Deeper Thinking [Making Judgements]: ▪ Show the introductory picture & quote ▪ Ask students to share their opinions about the introduction. Below are some examples to prompt discussion: ○ *What are some chemical reactions you already know of?* ○ *How can you classify the reactions you know of?* ○ *What do you want to learn in this lesson about reactions?* Providing Direct Instruction [Lecture]: ▪ Give an overview of the main activities in the lesson (use Moodle introduction as needed) ▪ Write the learning goals on the board ▪ Discuss the learning goals and answer any questions ▪ Transition to first activity ▪	Use of Questioning to Prompt Deeper Thinking ▪ Making Judgements Providing Direct Instruction ▪ Lecture	Reasoning Skills ▪ offering opinions with reasons

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Students learn about synthesis and decomposition reactions **(20 mins)**	**3-2A: Synthesis and Decomposition Reactions** Providing Direct Instruction [Questioning]: ▪ Introduce the section. Use the Moodle introduction. ▪ Ask students what type of reactions they think synthesis and decomposition are if they are opposites of one another and on the basis of their names Providing Direct Instruction [Group Reading]: ▪ Lead students through a reading of content on page ▪ Ask student volunteers to take turns reading aloud ▪ While reading through page, pause to discuss HOT Prompts Supporting Student improvement [Review & Practice]: ▪ Direct students to the online self-check quiz. ▪ Circle the classroom and provide guidance or feedback to students when necessary.	Providing Direct Instruction ▪ Questioning Providing Direct Instruction ▪ Group Reading Supporting Student improvement ▪ Review & Practice	Reasoning skills ▪ Offering opinions with reasons Problem-solving skills ▪ Formulating and interpreting the problem, drawing connections
Students learn about single and double displacement reactions **(30 mins)**	**3-2B: Single and Double Displacement Reactions** Use of Questioning to prompt deeper thinking [Making Judgements]: ▪ Introduce the section. Use the Moodle introduction. ▪ Ask students what type of reactions they think displacement reactions are based on the name Providing Overt Instruction Through Text [Text Reading Skills]: ▪ Instruct students to form groups of 2 ▪ Instruct students to read through the page together taking turns, and pausing to clarify doubts with one another	Use of Questioning to prompt deeper thinking ▪ Making Judgements Providing Overt Instruction Through Text ▪ Text Reading Skills	Reasoning skills: ▪ Offering opinions with reasons Processing skills: ▪ Recording Results ▪ Gathering evidence and data ▪ Forming conclusions

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	▪ Instruct students to learn about mining and carbon monoxide together and write their own paragraphs ▪ Ask student volunteers to share their paragraphs with the class Supporting Student improvement [Review & Practice]: ▪ Direct students to the online self-check quiz. ▪ Circle the classroom and provide guidance or feedback to students when necessary.	Supporting Student improvement ▪ Review & Practice	Problem-solving skills ▪ Formulating and interpreting the problem, drawing connections
Students learn about combustion and corrosion **(30 mins)**	**3-2C: Combustion and Corrosion** Providing Direct Instruction [Questioning]: ▪ Introduce the section. Use the Moodle introduction. ▪ Ask students where they have seen combustion and corrosion in their own lives Providing Direct Instruction [Group Reading]: ▪ Lead students through a reading of content on page ▪ Ask student volunteers to take turns reading aloud ▪ While reading through page, pause to discuss HOT Prompts Supporting Student improvement [Review & Practice]: ▪ Direct students to the online self-check quiz ▪ Circle the classroom and provide guidance or feedback to students when necessary	Providing Direct Instruction ▪ Questioning Providing Direct Instruction ▪ Group Reading Supporting Student improvement ▪ Review & Practice	Reasoning skills ▪ Offering opinions with reasons Problem-solving skills ▪ Formulating and interpreting the problem, drawing connections
Students work in pairs to learn	**3-2C: Reactions Around Us – CA**		Research skills: ▪ Gathering information

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about real world reactions **(20 mins)**	Group Structure [Teamwork Skills]: ▪ Instruct students to split into pairs ▪ Instruct students to find two examples each of the four different categories of reactions: synthesis, decomposition, single displacement and double displacement	Group Structure ▪ Teamwork skills	▪ Investigating
Students analyze the issues and impact of different chemical reactions in the real world **(120 mins)**	**3-2D: Issues with Reactions** Modelling [Demonstration and Use of Examples]: ▪ Introduce the assignment ▪ Discuss rubric expectations ▪ Present the sample post & response ▪ Clarify doubts and allow student questions Supporting Student Improvement [Track Student Achievement]: ▪ Instruct students to complete their forum post and response ▪ Circle the classroom and provide guidance or feedback to students when necessary	Modelling ▪ Demonstration ▪ Use of Examples Supporting Student Improvement ▪ Track Student Achievement	Planning skills ▪ Making a plan for solving a problem Research skills ▪ Gathering Information Presentation skills ▪ Expressing Ideas
Students recap the learning session **(5 mins)**	**3-2E: Wrap up & Reflection** Supporting Student Improvement [Review]: ▪ Go through the academic goals from the beginning of the lesson and jointly affirm the learning. ▪ Ask the students if there are any questions.	Supporting Student Improvement ▪ Review	Reasoning skills ▪ Offering opinions with reasons
Students reflect on the learning goals and lesson content **(5 mins)**	**3-2F: Exit Card** Use of questioning to check for understanding [Exit Card]: ▪ Instruct students to fill out the Exit Card.	Use of questioning to check for understanding ▪ Exit Card	Reflecting skills ▪ Reflecting on and assessing progress

*Teaching Scenarios & Instructional Strategies

Providing Direct Instruction

- Lecture:
  - Think/Pair/Share
  - Visuals
  - Anchor Charts
  - Notetaking

Providing Overt Instruction Through Text

- Text Reading Skills
  - Skimming and Scanning
  - Summarization
  - Reading Between the Lines
  - Sorting Ideas with Concept Mapping
  - Organizational patterns (sequencing, compare/contrast, cause/effect, order of importance, classification, pros/cons)
  - Identifying signal words
  - Using context to find meaning
  - Tips for reading graphical text

Modelling

- Demonstration
  - Teacher completed examples
  - Teacher think and read aloud
  - My Favourite No
- Use of Examples
  - Visuals/Anchor Charts
  - Provide weak and strong exemplars

Promoting Student Talk

- Respectful talk
  - Discussion prompts
  - Sentence Starters
- Talk Strategies
  - Brainstorming
  - Think/Pair/Share
  - Active Listening
  - Inside/Outside Circle
  - Slide the Line
  - Stand Up Game
  - Four Corners
  - Take Five
  - Timed Retell

Facilitating Collaborative Learning

- Group Structure
  - Roles
  - Teamwork skills
- Group Strategies
  - Round Robin
  - Numbered Heads
  - Placemat
  - Shared Reading/Jigsaw

Use of Questioning

- To activate prior knowledge
  - Diagnostic quiz
  - Anticipation Guide
- To check for understanding
  - Thumbs Up
  - Individual Whiteboards
  - Red, Yellow, Green Light
  - Exit Cards
- To prompt deeper thinking
  - Critical Thinking Routines
  - Drawing Conclusions
  - Making Judgements

Providing Formative Feedback

- Feedback structure
  - What has been done well
  - What needs improvement
  - How to improve
- Evaluative vs Descriptive Feedback

Supporting Student Improvement

- Track Student Achievement
- Break down learning
  - Chunking
  - Scaffolding
- Review and Practice
- Differentiate Instruction and Resources

*Higher Order Thinking Skills:

- **Research skills:** formulating questions, gathering information, brainstorming, investigating, etc.
- **Problem-solving skills**: formulating and interpreting the problem, drawing connections, estimating, classifying, recognizing relationships, hypothesizing, etc.
- **Planning skills:** generating ideas, gathering information, organizing information, making a plan for solving the problem
- **Processing skills:** carrying out a plan; reflecting on the solution; recording results; gathering evidence and data; observing; manipulating materials and equipment, etc.
- **Reasoning skills:** offering opinions with reasons; evaluating results; making judgements and conclusions, etc.
- **Presentation skills:** expressing ideas; using appropriate linguistic, numeric, symbolic, and graphic modes of representation; conveying meaning through various text form, etc.
- **Critical/Creative thinking skills:** analyzing, interpreting, evaluating, making connections, etc.
- **Reflecting skills:** setting goals; reflecting on and assessing progress, etc.