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Chemistry-Related Activity Breaks in the Post-Secondary Classroom

An activity break, or movement break, is a break from sedentary activity. Activity breaks in the post-secondary classroom have been shown to increase concentration, alertness, and enjoyment[1]. One criticism of activity breaks in the classroom is that they may not be relevant to the class material and that some students find activity breaks disruptive to learning[2]. Our goal was to develop and implement chemistry-related activity breaks. We presented four different activity breaks at the 51st College Chemistry Canada in 2025. We will present lessons plans for three of these activity breaks below and hope that educators will implement them in their classrooms and share their experiences.

Activity overviews are found on following pages.

Please contact Erin (erind@nait.ca) or Melanie (melaniek@nait.ca) if you would like a copy of the slides for presentation in your classroom.

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(3) *VSEPR Yoga by NJC Chemists*; 2020. https://www.youtube.com/watch?v=LYd9a-D83V0 (accessed 2026-01-07).

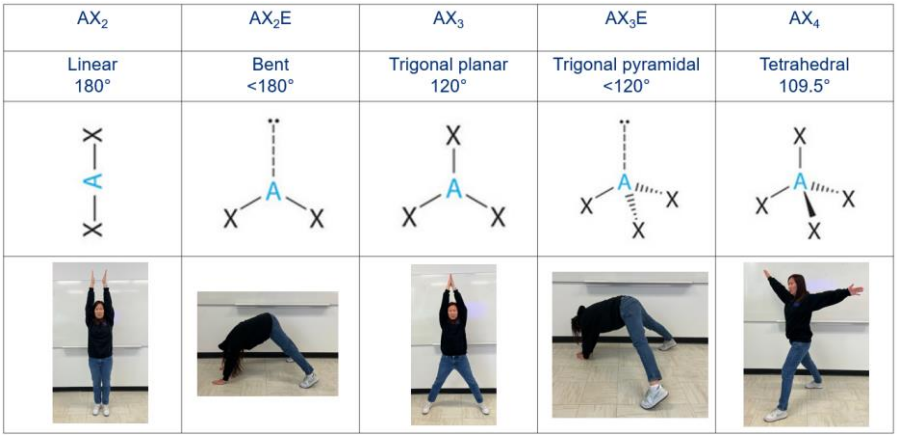
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(5) *6.2: A Quick Review of Thermodynamics and Kinetics*. Chemistry LibreTexts. https://chem.libretexts.org/Courses/Oregon_Institute_of_Technology/OIT%3A_CHE_333_-_Organic_Chemistry_III_(Lund)/New_Page/6%3A_Overview_of_Organic_Reactivity/6.2%3A_A_Quick_Review_of_Thermodynamics_and_Kinetics (accessed 2026-01-07).

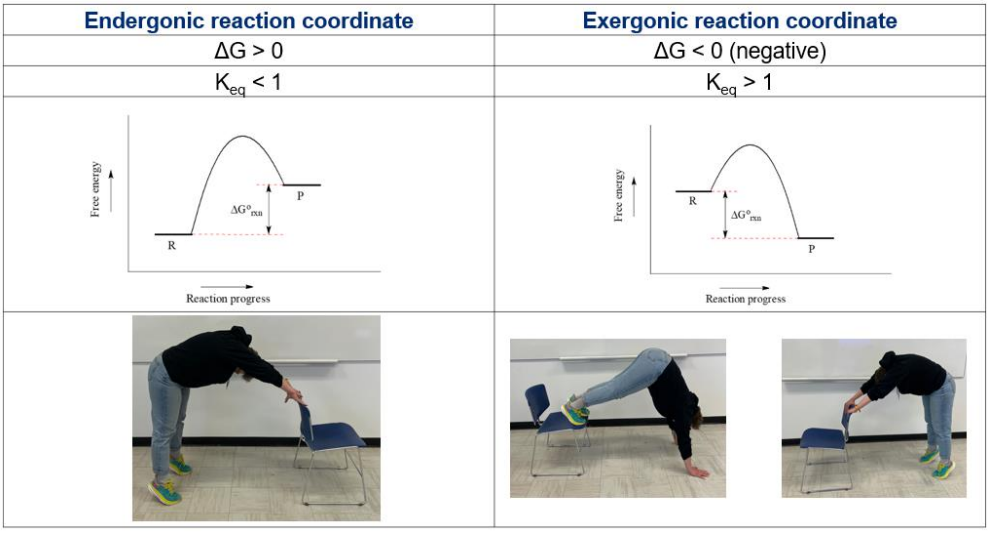
(6) *8.2: Two mechanistic models for a nucleophilic substitution reaction*. Chemistry LibreTexts. https://chem.libretexts.org/Under_Construction/Purgatory/Book%3A_Organic_Chemistry_with_a_Biological_Emphasis_(Soderberg)/Chapter_08%3A_Nucleophilic_substitution_reactions_I/8.2%3A_Two_mechanistic_models_for_a_nucleophilic_substitution_reaction (accessed 2026-01-07).

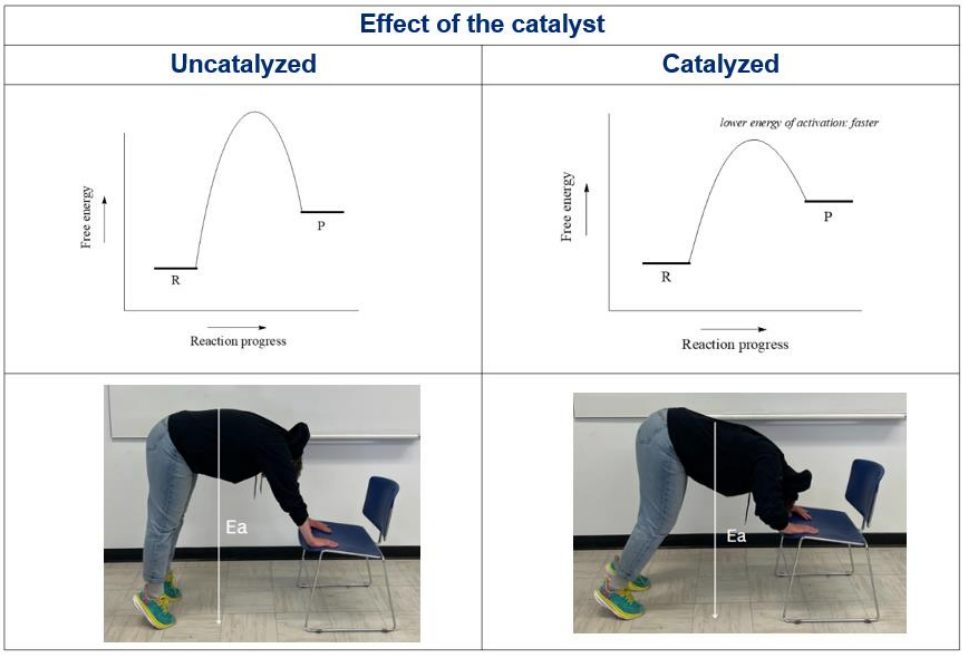
1. Valence-Shell Electron-Pair Repulsion (VSEPR) Theory

This poses presented in this lesson are based on the video *VSEPR Yoga*[3], available on YouTube.

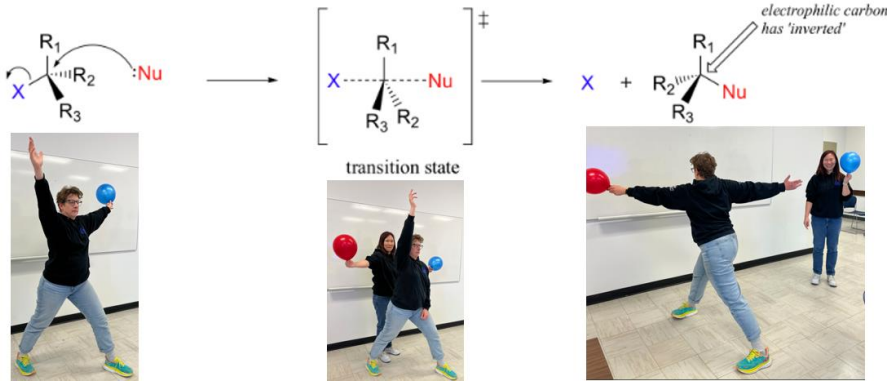
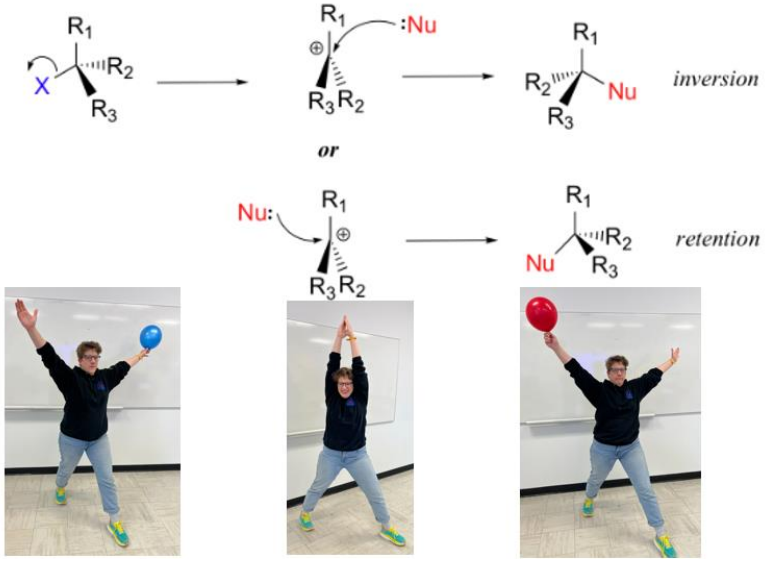
Lesson	**VSEPR**
Learning outcome	*Use VSEPR model to predict molecular geometries.*
Background	Students should be previously introduced to VSEPR theory, including: 1. Draw the Lewis structure of the molecule or polyatomic ion. 2. Determine the electron group arrangement around the central atom. 3. Assign AX_mE_n designation. 4. Assign molecular geometry.
Procedure	Students stand up from their seats and find space to perform the poses. Poses below are presented sequentially, emphasizing the geometry of each pose.  VSEPR figures from Libre Texts Chemistry[4].
Formative assessment	The instructor asks the following questions and the students answer by performing the corresponding pose. 1. Which VSEPR geometry corresponds with the arrangement AX_2E? *bent* 2. What is the AX_mE_n designation for CO_2 and the molecular geometry? *AX_2, linear* 3. What is the molecular geometry for the molecules: a. SO_2 *bent* b. NH_3 *trigonal pyramidal* c. CH_4 *tetrahedral*

2. Reaction Coordinate Diagrams

Lesson	Reaction coordinate diagrams.
Learning outcome	Analyze a reaction coordinate diagram and classify a reaction as: • Endergonic ($\Delta G > 0$, $K_{eq} < 1$) • Exergonic ($\Delta G < 0$, $K_{eq} > 1$) Identify activation energy on a reaction coordinate diagram and explain the role of a catalyst as it relates to activation energy.
Background	Students should be previously introduced to reaction coordinate diagrams and understand the terms endergonic, exergonic and the relationship of these terms with ΔG and K_{eq} values.
Procedure	Students stand up from their seats and find space to perform the poses. Students should have a chair to pose with. Poses below are presented sequentially, emphasizing which body part is representing the reactants (feet or hands) and which is representing the products (feet or hands).  Reaction coordinated diagrams are from Libre Texts[5].
Formative assessment	The instructor asks the following questions and the students answer by performing the corresponding pose. 1. What is the reaction coordinate diagram for an exergonic reaction? *See above* 2. What is the reaction coordinate diagram for a reaction with a -ΔG? *See above, exergonic* *3.* What is the reaction coordinate for a reaction where the equilibrium lies to the reactants? *See above, endergonic*

Procedure	Instructor can then describe the effects of catalysis using the diagram below.  Reaction coordinated diagrams are from Libre Texts[5]
Assessment	The instructor can then ask the questions: 4. What is the reaction coordinate diagram for an endergonic reaction? *See above left* 5. Show the same reaction with the addition of a catalyst. *See above right*

3. S_N1 and S_N2 Reactions

Lesson	S_N1 and S_N2 Reactions
Learning outcome	*Describe the mechanistic differences between S_N1 and S_N2 reactions.*
Background	Students should be previously introduced to the mechanisms of S_N1 and S_N2 reactions. For the extension activity, students should be familiar with the reaction conditions (solvent type, nucleophile type, electrophile type) that are associated with each mechanism.
Materials	Each student group will need one red balloon and one blue balloon.
Procedure	Summarize the key mechanistic differences between S_N1 and S_N2 reactions: S_N2 : bimolecular reaction (backside attack), results in an inversion of stereochemistry S_N1: dissociation occurs first, carbocation intermediate, stereochemistry is retained 50% of the time Students will work in pairs or small groups to act out the mechanisms represented below. S_N2 reaction:  S_N1 reaction:  Reaction mechanisms from Libre Texts Chemistry[6].

Extension and formative assessment	The instructor asks the following questions and the students answer by performing the corresponding set of poses. 1. Which reaction most likely will occur if the electrophilic carbon is a 3° carbon? *S_N1* 2. Which reaction occurs in a polar protic solvent? *S_N2*

52nd College Chemistry Canada Conference

Chemistry for All

Nunavut Arctic College
Nunatta Campus

Iqaluit, NU
29 May – 01 June 2026



Details for the 2026 College Chemistry Canada Conference can be found at the conference website.
Registration and abstract submission is now open!

2YC3 Affiliate Conference Dates

Conference 2026

May 29-30, 2026
Montgomery College, Takoma Park-Silver Spring Campus
Maryland

Conference Website: 2YC3 226th Conference

Conference 2027

May 28-29, 2027
Perimeter College Campus, Georgia State University
Georgia

Conference 2028

May 26-27, 2028
Temple College
Texas

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