

Institute for Creative Teaching Lesson Plan

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Lesson Title: Electron Dance

Standards Addressed: Content Area: Science

HS-PS1-2 Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

Concepts and skills students master:

Students will understand the differences between three common forms of chemical bonding: ionic, non-polar covalent, and polar covalent

Grade Level: High School Chemistry

Purpose: In this lesson students will take their understanding of chemical bonding and deepen it by using it as the subject of an artistic piece taking the form of either a dance, or a theatrical skit.

Learning Objective: Through the creation of a dance or skit, the students will provide themselves with a relevant visual representation of a concept that must otherwise be understood through models abstract thought.

CRISPA Themes:

Connections: Students will be encouraged to bring in popular forms of dance and relevant pop culture references to make their performance more accessible to themselves and their class mates.

Risk Taking: Creating and performing a dance or skit in front of their classmates will require them to step out of their comfort zones.

Imagination: Students will be required to use their own ideas to come up with the content of their performances.

Sensory Experience: The students participating in the performance will certainly use many of their senses. The students in the audience will also, but to a lesser degree, I believe.

Active Engagement: Students in a skit or dance can hardly sit in the wings and not participate. The groups will be small and arranged such that every student has an important role in the final product.

Materials and preparation: Students will need to be put into groups, I recommend that the teacher group the students so that students are in groups with mixed levels (both with regard to chemistry and artistic experience). Students will need to determine what props they will need for their dance or skit. Students should also be provided an optional storyboard, if that will help them in their creative process.

Timeline: Students participating in this lesson should have just learned about chemical bonding and will use this as a chance to demonstrate that knowledge, their creativity, and hopefully enrich their and classmates understanding of the content. The amount of time for this lesson would probably fall into the hour-and-a-half to two hour range. Therefore, students on block scheduling should be able to do it in one class period, other students will probably require two class periods.

Warm up: The teacher should cut up a periodic table(s) (with electronegativities clearly labeled) into cards. The teacher will spread the cards face down across a table. The teacher will ask for two volunteers. The volunteers will come to the table the teacher will instruct the two students to each select one card. The students will each read what their element is and what its electronegativity is. The teacher will then ask the class what kind of bond would be formed if these two elements were to react. Students will then be instructed to come select five cards each from the table, but not to look at them yet. They will then return to their seats. When the teacher says go, they will stand up and walk around the room, when they come to one of their classmates they will each reveal one of their cards and decide what kind of bond the two elements revealed would make if they were to bond. After they use all 5 of their cards they should return them to the table and sit down.

Procedure: Now that the students are primed for thinking about chemical bonding, they should be ready to be given the project.

1. The teacher should tell the students what the activity will be and then present the learning target by writing it on the board and reading it aloud to the class.
2. The teacher should then hand out a sheet describing in more detail the requirements for the dance/skit. Students should be given time to read through the sheet before proceeding. The teacher should check that everyone understands the assignment.
3. The teacher should then ask the students to divide into two large groups: students who want to dance, and students who want to act.
4. Once these groups are established, the teacher should divide them into groups of three and four based on the criteria I listed in the preparation section.

5. Now that groups are established, students should be given a solid chunk of time to create and practice their performance. The amount of time will vary due to scheduling differences, but make sure to leave time for performance and reflection.
6. Once the performances are ready to go, have students draw numbers out of a hat to determine performance order (if you like, at a one minute time to allow for trading). The teacher will then write the order on the board. Hand out a slip of paper with three boxes labeled, "See", "Wonder", and "Think" respectively. Explain that while we will be observing each performance, each group will meet with another group after all are done to discuss them. Then assign each group a performance to observe more carefully.
7. Students will give their performances.
8. Have the students break out into groups and discuss their observations. In this section, students should be given a lot of freedom. They should feel free to discuss the performance purely in artist or scientific terms. They should also feel free to discuss it in terms of both.

Differentiation: By selecting the final groups, the teacher should be able to get students together to assist with language or content needs. Also, students are given the choice between dancing and acting. While both will make them take risks, they will be able to go to the one that they will most enjoy and be capable in.

Assessment: In addition to watching the performances, the teacher can require the students to hand in a short quick write about what they observed and learned during the activity before leaving class.

Chemical Bonding Dance/Skit

In this activity you and your group must use your knowledge of the different kinds of chemical bonding to come up with a short dance or skit that represents one of them.

In a moment, you will be given the choice between the two. Before you choose, here are the requirements for each.

Dance:

- Each student must play an active role in the dance.
- The dance must be at least one minute long.
- You may choose the kind of bonding you want to represent.
- Be prepared to discuss your dance with your classmates afterwards.

Skit:

- Each student must have *at least* one line in the skit.
- The skit should be between 2-3 minutes long.
- You may choose the kind of bonding you want to represent.
- Be prepared to discuss your skit with your classmates afterwards.

Each group will also be assigned a performance to pay special attention to and take notes on (a special notepaper will be provided later). After all the performances, these groups will get together and discuss each other's. Remember our classroom rules and that none of us are professional actors or dancers and keep your comments constructive.

See...	Wonder...	Think...
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See...	Wonder...	Think...
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