

Class: Grade 10 Science

Lesson Title: As a Matter of Act (Weather + Matter)

Class Size: 24

Time: 40 mins

Curriculum Outcomes:

Unit 2- Earth and Space Science: Weather Dynamics

Learning Objectives:

1. Seeks to simulate various weather conditions and give students an understanding of how different states of matter – i.e. solids, liquids, and gases – react to stimuli such as rain, extreme temperatures, and wind.

Materials:

- Three different colors/designs of tape
 - *Cold water bottles (preferably frozen)
 - *Scarves, mittens, and related outdoor wear
 - *Fans (folded paper will suffice)
 - YouTube clips that depict rain, strong wind, warm sunlight, and cold snow
 - Smart Board
- *Quantity depends on class size*

Preparation beforehand:

- Tape three large areas beside one another in an open part of the classroom.

Introduction:

1. Prior to the Kinulation, provide students with basic information relating to how various states of matter react to external stimuli. For example, explain that liquids typically freeze in extreme cold and gases typically disperse in the wind.
2. Explain what a kinulation is (broken up into kinesthetic and simulation). Tell them that these are used to help students learn difficult concepts that are otherwise difficult to picture. It allows students to become part of the demonstration, and therefore easier to learn. Ask students if they would like to try one.

Activity:

1. Number students from 1-4.
2. Move all desks and chairs to the side. On the floor, use tape to mark three distinct boxes – one for solids, one for liquids, and one for gases.
3. Ask Group 1 to enter the Solids box, Group 2 to enter the Liquids box, and Group 3 to enter the Gases box. Group 4 will be “weather makers.”
4. Give Group 4 props for the first simulation (e.g. fans for wind). Play an appropriate YouTube clip and ask Group 4 to use its props to simulate the given weather effect (you may want to play a YouTube clip of rain, or wind howling, etc.). Encourage Groups 1-3 to consider their state of matter and react accordingly. For example, if wind is the first weather effect, Group 1 (Solids) may move around slightly, Group 2 (Liquids) may simulate waves, and Group 3 (Gases) may disperse.
5. Following the weather effect, ask each group to justify its reaction. Take the opportunity to discuss reactions of matter to weather conditions in-depth and answer student questions.
6. Rotate Groups 1-4 and simulate another weather condition. Repeat this process for the remainder of the Kinulation.

Conclusion – Possible wrap-up questions:

1. Ask students what they learned from the Kinulation. Is there anything that they would like to better understand?
2. Ask students to name extreme conditions that are unrelated to weather, e.g. fire and kinetic motion. What effects do these stimuli have on different states of matter?
3. How might this activity have changed if we had forced the molecules of different states to mix beforehand?