

Creative Dance Lesson Plan on States of Matter and Changes

Grade: 5th

Length: 45 minutes

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Student Learning Outcome: The students will demonstrate understanding of states of matter and physical vs. chemical changes by solving assigned movement problems.

Equipment Needed: Hand Drum; CD player; creative dance music; word strips; pictures of chemical and physical changes.

Utah Core – Science

Standard 1: Students will understand that chemical and physical changes occur in matter.

Objective 2: Evaluate evidence that indicates a physical change has occurred.

a. Identify the physical properties of matter (e.g. hard, soft, solid, liquid, gas).

Objective 3: Investigate evidence for changes in matter that occur during a chemical reaction.

d. Compare a physical change to a chemical change.

Utah Fine Arts Core -- Dance

Standard 3: The student will improvise, create, perform, and respond to movement solutions in the art form of dance.

Objective 1: Explore the process of making a dance.

a. Explore a movement sequence by selecting a visual or verbal image and abstract it into movement; e.g., pictures, objects, phrase from a story or poem, metaphor, or simile.

Behavioral Expectations: (5 minutes)

While sitting, everyone close your eyes. Raise one arm and put your hand in a fist. Shake your fist at the ceiling. Lower your arm and place it in your lap. Open your eyes. How did you know what your arm and hand were doing if you couldn't see them? You felt them through your kinesthetic awareness. Feeling what your body is doing is what separates creative dance movement from everyday movement.

How is an atom shaped? There is a very dense nucleus with electrons in the surrounding space. If your body represented one atom, what would be the nucleus and what would be the electrons? I like to think of your body being a nucleus and the border around your personal space is where the electrons are located. When I turn on the music, everyone will skip throughout the room, but make sure that your electrons do not bump into anyone else's electrons!

We have two important rules for today that we need to remember:

1. Do not let your electrons bump into anyone else's electrons! They should also not hit the walls, steps, stage, or doors.

2. When the music or drumming stops, you must freeze. Don't move a muscle.

Let's try moving throughout the room one more time. This time find ways to slide throughout the space, but remember our two rules!

Experience/Identify: (10 minutes)

Solids - Axial Movement

Hang up two word strips:

- 1) Every object in the world is made up of atoms.
- 2) Every atom is in a constant state of motion.

If those are true, how do objects in the world not move. Let's take a rock, for example. Is a rock made up of atoms? Do those atoms move? In solids, each atom moves in its place. They don't really travel throughout the object, but each atom moves in place. Try being an atom in a solid, like a rock, piece of wood, or an ice cube. Vibrate in place. Shake and bend. Body movements that keep your body in place are called axial movements.

Liquids - Average Locomotor Movement

Atoms in liquids move more than atoms in solids. This allows them to bend and become the shape of whatever container they are put in, or to spread out across a surface. They can bounce from place to place. That is one reason why it is so easy to separate a liquid into smaller pieces or amounts. Explore locomotion with words like melt, slosh, ripple, and pour.

Gasses - Quick Locomotor Movement

What do you know about gasses? One thing I always remember is that they spread out to fill whatever size container they are in. The atoms in a gas can spread apart or squish together to take up more or less space with the same amount of gas. This is because the atoms in a gas are extremely mobile and move very quickly. Move quickly through the space with jogs, skitters, skips, jumps, and hops.

How can an object change from one state to another? How would I change a frozen, solid stick of butter to a melted, liquid pool of butter? Heating it up! As atoms become hotter and hotter they change from solid to liquid to gas. So as the atoms get hotter, they move faster, and become less dense.

Explore/Investigate: (12 minutes)

Physical Changes involving states of matter

Divide into small groups to create movement sequences based on a movement problem. For example, students are a frozen stick of butter that then becomes liquid and evaporates. Or they are a cloud high in the atmosphere that becomes water droplets. Explain that matter cannot jump from one state to a state that is not adjacent. For example, a solid cannot become a gas without first passing through a liquid state. Observe each group perform.

Movement Problems may include:

- Melting a piece of gold, shaping the liquid into a ring, and allowing it to cool
- Putting a piece of ice on a hot sidewalk and in two hours it had "disappeared"
- Pouring juice into trays and putting them into the freezer to make popsicles
- A cloud raining
- Water inside a tea kettle that starts to whistle

All of the examples I gave you are physical changes. Most physical changes can be reversed. They can be done forwards and backwards. What are some other physical changes we can see every day? Boiling or freezing water, dissolving sugar in water, magnetizing a piece of metal, etc.

Chemical Changes

Everyone fall to the ground. Freeze. Now, stand up moving in the exact same way that you fell to the ground, just backwards. Can anyone do it? This is like a chemical change. We can't reverse it, because gravity pulled us down, but can't push us up. What are some real chemical changes we see every day? Gasoline burning in a car. Eggs cooking. Iron Rusting. Fireworks exploding.

Create/Perform: (15 minutes)

With the students, create two movement cinquains: one about physical change and one about chemical change. Use Physical and Chemical change pictures as inspirations. An easy cinquain pattern I like to follow is as follows:

Noun
Adjective, Adjective
Verb, Verb, Verb
Four word descriptive phrase
Noun

EX.	Physical	Chemical
	Reversible, Stable	Irreversible, Creation
	Melting, Boiling, Dissolving	Burning, Exploding, Rusting
	Stays the same Substance	Changes chemicals in substance
	Transformation	Generate

After the cinquains are collaboratively created, pull movement ideas from students to create a movement sequence. Use axial movements for nouns and adjectives and locomotor movements for verbs.

Connect/Analyze: (3 minutes)

Discuss connections between temperature and atom movements as well as the differences between physical and chemical changes. Give students more examples of physical and chemical changes to see if they can differentiate between them.