

**ITQ ARTS AND SCIENCE INTEGRATION  
GRADE 5  
THEATRE AND PHYSICAL SCIENCE**

**Improvisation - Using Theatre to Create Meaning  
“Mixtures and Solutions,” Investigations 2 and 3  
LESSON # 2**

**CONTENT STANDARDS**

**Theatre**

- 1.1** Use the vocabulary of theatre, such as sense memory, script, cue, monologue, dialogue, protagonist, and antagonist, to describe theatrical experiences.
- 1.2** Identify the structural elements of plot (exposition, complication, crisis, climax and resolution in script or theatrical experience.
- 2.1** Participate in improvisational activities to explore complex ideas and universal themes in literature and life.
- 2.3** Collaborate as an actor, director, scriptwriter or technical artist in creating formal or informal theatrical performances.
- 55.4** Use theatrical skills to dramatize events and concepts from other curriculum areas, such as reenacting the signing of the Declaration of Independence in history-social science.

**Physical Science**

- PS1B** Students know all matter is made of atoms, which may combine to form molecules.
- PS1g** Students know properties of solid, liquid, and gaseous substances, such as sugar, water, helium, oxygen, nitrogen and carbon dioxide.
- I&E6c** Plan and conduct a simple investigation based on a student developed question and write instructions others can follow to carry out the procedure.

**ESSENTIAL QUESTIONS** (*Questions students might ask about the topic*)

- What tools do actors use to show “character” to an audience?
- What are the different parts of a story?
- What is improvisation?
- What different jobs are there in theatre?
- How can theatre be used to tell stories from science?
- What can be created when atoms join together?
- Do different molecules have different qualities?
- What is the fundamental building block of matter?

**OBJECTIVES & STUDENT OUTCOMES** (*Students will be able to.....*)

- create character through gesture, posture and vocal expression.
- identify elements of plot in a short improvisation.
- use improvisation to create a short script about a scientific concept.
- practice skills of an actor and playwright.
- demonstrate both monologue and dialogue.
- articulate the difference between an atom and a molecule.
- build physical representations of the molecules water, helium, oxygen, nitrogen and carbon dioxide.

**ASSESSMENT** (*Various strategies to evaluate effectiveness of instruction and student learning*)

- **Feedback for Teacher**
  - Scene observation
  - Video
- **Feedback for Student**
  - Teacher/Peer Comments
  - Video

**WORDS TO KNOW**

**Theatre Grade 5**

- **climax:** The point of highest dramatic tension or a major turning point in the action.
- **complication:** The inciting incident that introduces the problem or conflict.
- **crisis:** A decisive point in the plot of a play on which the outcome of the remaining actions depends.
- **dialogue:** The conversation between actors on stage.
- **director:** The person who oversees the entire process of staging a production.
- **exposition:** Detailed information revealing the facts of a plot.
- **improvisation (improv):** A spontaneous style of theatre in which scenes are created without advance rehearsing or scripting.
- **monologue:** A long speech by a single actor.
- **resolution:** The ending where loose ends are wrapped up.

### Science Grade 5

- **atom:** The smallest particle of an element. Atoms are the building blocks of matter.
- **matter:** Anything that has mass and takes up space.
- **molecule:** The smallest part of a substance that is made up of two or more atoms.

### MATERIALS

- “Improvisation Starters” (Attached)
- “Atomic ‘Cheat’ Sheet” (Attached)
- Video camera

### RESOURCES

- VAPA Core Learnings: <http://www.sandi.net/204510720114515653/site/default.asp>
- *FOSS Kit Grade 5*, “Mixtures and Solutions,” Investigations 1, 2 and 3
- Online improvisation lesson videos: [http://www.ehow.com/video\\_4949233\\_improv-yes-lets.html](http://www.ehow.com/video_4949233_improv-yes-lets.html)
- *Theatre Games for the Classroom*, Viola Spolin (available on Google Books at <http://tinyurl.com/spolinbook>)

### PREPARATION

- Lead Actor Warm Up from Day One as time allows.
- Review Investigation 3 in *FOSS* “Mixtures and Solutions.”
- Make copies of “Improvisation Starters” and “Atomic ‘Cheat’ Sheet.”

### WARM UP *(Engage students, access prior learning, review, hook or activity to focus the student for learning)*

(5 minutes)

- Lead “Space Walks” from Viola Spolin’s book, *Theatre Games for the Classroom*. Pages 35 – 41.
- Students walk around in the space as if seeing and experiencing it for the first time.
- Teachers move around space with students calling out side coaching tips.
- Guide students to explore the space while keeping their bodies very neutral and relaxed.
- Call out different parts of the body to encourage students to explore the space.
- *Say:* *Feel the space with your hands/eyes/toes/etc.*
- After a couple of minutes have students explore the space as a solid, then a liquid, then a gas. Side coach students to float like a gas, or move fluidly like a liquid, etc.

### MODELING *(Presentation of new material, demonstration of the process, direct instruction)*

(25 minutes)

- Tell students that they are going to create a piece of theatre using what they know about **matter**, **atoms** and **molecules**. They will create a piece of theatre that uses the **improvisation** skills they used in lesson one and teach these science concepts to an audience.
- Review with students what they know about **matter**. [solid, liquid, gas] Write responses on board. Review vocabulary.
- Ask students about the tiny parts that make up all **matter**. [**atoms**] Write response on board. Review vocabulary.
- Ask students what can be created when two different kinds of atoms, like hydrogen and oxygen, bond together. [water **molecule**]. Write response on board. Review vocabulary.
- Write the chemical formula for water on the board. (H<sub>2</sub>O) Review how to read this formula to determine there are two hydrogen atoms and one oxygen atom. They will use this skill in the guided practice to

determine the characters in their **improvisation**.

- Say: An **improvisation**, like any piece of theatre or literature, has a certain structure that makes up the beginning, middle and end. There are specific words that we use for these elements: **exposition**, **complication** (which make up the beginning), **crisis**, **climax** (which make up the middle), **resolution** (which makes up the ending).
- Write these words on the board. Review vocabulary.
- Introduce the **improv** structure “Super Heros.”
- Say:
  - In this structure you will be assigned to portray a certain type of **atom**. In the **improvisation** this information will be revealed to the audience in the **exposition**.
  - They will review the characteristics of this **atom** and how they may incorporate that into creating character with their face, body and voice.
  - They will be given a location for the **improvisation** to take place. This will also be revealed in the **exposition**.
  - They will be given a problem to overcome. This will be introduced in the **complication**.
- Introduce the vocabulary of **monologue** and **dialogue**.
- Say:
  - One of the **atom** characters will come on stage and deliver a **monologue** introducing him/herself and the problem. This character will then call on the other character to help with the problem.
  - In each **improvisation** the **atoms** will try different ideas to solve the problem. This makes up the **crisis**.
  - Finally the **atoms** will agree to bond together to create a chemical reaction and a **molecule** that can solve the problem. This is the **climax**.
  - The ending includes the characters tying up any loose ends and creating an exit from the stage.
- Ask for three volunteers to demonstrate the **improvisation**.
- Assign one student to be one **atom** of oxygen and the other two to be **atoms** of hydrogen.
- Brainstorm with the class the characteristics of each **atom**. Chart the responses.
  - Oxygen [Has cubic crystal structure. Is colorless, odorless, and tasteless. Symbol is O. Atomic number is 8. Is used to breath. Is a gas.]
  - Hydrogen [Has a hexagon crystal structure. Is colorless. Is the lightest element. Symbol is H. Atomic number is 1. Can be used for rocket fuel.]
- Remind students that together these **atoms** make a water molecule.
- Assign the setting as the Secret Super Hero **Atom** Cave.
- Assign the problem: the people of the world are very thirsty.
- The oxygen molecule starts on stage frozen in position. When the teacher says “curtain” the students begin the **improvisation**. Side coach as necessary.
- Say:
  - Introduce the problem. Use your setting. Show us your character with your body/voice/face. Bring in the next character. What is the **crisis**? Work to solve the problem. Develop the **climax**. What do you make when you come together as a **molecule**? Change your body/voice/face to show the new character. Find an ending, etc.
- After the **improvisation** have students discuss what was successful about it.

### **GUIDED PRACTICE** (Application of knowledge, problem solving, corrective feedback)

(15 minutes)

- Divide students into groups of twos, threes and fours.
- Depending on the size of each group give them an “**Improvisation** Starter” paper. (Attached)
- Give each group the “**Atomic** Cheat Sheet”. (Attached)
- Allow students two minutes to brainstorm about their characters, the problem and the **molecule** they will be forming.
- Have first student to appear in each **improvisation** freeze in a tableau of their character.
- As the leader says “curtain,” all groups begin their **improvisations** simultaneously.
- Side coach as necessary.
- Say:
  - Introduce the problem. Use your setting. Show us your character with your body/voice/face. Bring in

the next character. What is the **crisis**? Work to solve the problem. Develop the **climax**. What do you make when you come together as a **molecule**? Change your body/voice/face to show the new character. Find an ending. Etc.

**DEBRIEF & REFLECT** (Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet outcomes?)  
(5 minutes)

- Bring group back together.
- Discuss the process of creating an **improvisation** from science content.
  - What did you learn about science?
  - What did you learn about **improvisation**?
  - How did your characters change during your **improvisation**?
  - Did your **improvisation** have the elements of plot?
  - Do you think an audience would learn something from your **improvisation**? What?
  - If you were to do this again, what would you change?
- As time allows have students recreate their **improvisations** for the group. Videotape **improvisations** whenever possible. Have students give peer feedback.

**EXTENSION** (Expectations created by the teacher that encourage students to participate in further research, make connections, and apply understanding and skills previously learned to personal experiences.)

- Discuss how to apply these same theatre skills to other subject areas such as social studies.

# Improvisation Starters

**(Copy and cut into strips for the appropriate number of groups.)**

## **For Groups of Two**

Characters: Determine from the following chemical formula who your characters are. If there is more than one of a certain atom hold up a piece of paper with a number on it to let the audience know how many of that atom you are.

$\text{CO}_2$  – Carbon dioxide

Setting: Super Secret Super Hero Atom Cave

Problem: The soda supply of the world has gone flat. It has no fizz.

## **For Groups of Two**

Characters: Determine from the following chemical formula who your characters are. If there is more than one of a certain atom hold up a piece of paper with a number on it to let the audience know how many of that atom you are.

$\text{CaCl}_2$  – Calcium Chloride

Setting: Super Secret Hero Atom Cave

Problem: The roads are frozen and it's not safe to drive.

## **For Groups of Three**

Characters: Determine from the following chemical formula who your characters are. If there is more than one of a certain atom hold up a piece of paper with a number on it to let the audience know how many of that atom you are.

$\text{C}_6\text{H}_8\text{O}_7$  – Citric Acid

Setting: Super Secret Hero Atom Cave

Problem: The sour patch kids candy is too sweet.

## **For Groups of Three**

Characters: Determine from the following chemical formula who your characters are. If there is more than one of a certain atom hold up a piece of paper with a number on it to let the audience know how many of that atom you are.

$\text{C}_6\text{H}_{12}\text{O}_6$  – Sugar (Glucose/Fructose)

Setting: Super Secret Hero Atom Cave

Problem: A giant toddler is throwing a temper tantrum, destroying buildings because of a sweet tooth.

## **For Groups of Four**

Characters: Determine from the following chemical formula who your characters are. If there is more than one of a certain atom hold up a piece of paper with a number on it to let the audience know how many of that atom you are.

$\text{NaHCO}_3$  – Baking soda

Setting: Super Secret Hero Atom Cave

Problem: A monster is attacking Metropolis because he has a tummy ache.

## Atomic “Cheat” Sheet

Use these facts to help develop your characters.

Carbon – Most often a diamond shape. Graphite is black. Diamond is colorless. Symbol is C. Atomic number is 6. The basis of fuels such as coal and oil.

Oxygen - Has cubic crystal structure. Is colorless, odorless, and tasteless. Symbol is O. Atomic number is 8. Is used to breath. Is a gas.

Calcium – Has a cube like crystal structure. Silvery white in color. In bones, teeth and metal. Symbol is Ca. Atomic number is 20. Used in cement. It is metallic.

Chlorine – Greenish yellow gas. Found commonly in seawater. Symbol is Cl. Atomic number is 17. It is used to make safe drinking water and cleaning compounds.

Hydrogen - Has a hexagon crystal structure. Is colorless. Is the lightest element. Symbol is H. Atomic number is 1. Can be used for rocket fuel.

Sodium – Has a cube like crystal structure. Silvery white in color. Symbol is Na. Atomic number is 11. Is part of the compound for table salt.

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