

# LESSON PLAN

## Chemical and Physical Change Documentary

Lesson: Chemical and Physical  
Change Documentary

Teacher: Katie Blunt

Course: 5th Grade Science

Time allotted: 4 weeks

Sequence: Lesson 1 of 4

Learning Objectives:

5th Grade Science Standard 1:  
Students will understand that  
chemical and physical  
changes occur in matter.

- Objective 1: Describe that matter is neither created nor destroyed even though it may undergo change.
- Objective 2: Evaluate evidence that indicates a physical change has occurred.
- Objective 3: Investigate evidence for changes in matter that occur during a chemical reaction.

Instructional Priorities:

Explicit instruction (ES: 0.57) (I, We, Y'all, You)  
Instructional hierarchy (ES: 0.57): Acquisition, Automaticity, Application (AAA)

DOK Level: 4

Designs, takes risks, researches synthesizing multiple resources, collaborates, plan, organizes and modifies, creates concrete tangible products.

Preparations Necessary:

Prerequisite:

- Students have been taught and understand Standard 1 concepts

Materials needed:

- Laboratory equipment and materials as described in the lesson plans provided on [uen.org](http://uen.org)
- [Pages storyboard template](#)

Technology needed:

- Computer, iPad, or other device that can record video and take photos
- Mac computer or iPad with Safari, Notes, Pages, Numbers, Keynote, PhotoBooth, and iMovie installed

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Note: This lesson plan can be adapted for any curriculum objectives in any subject area in any grade level.

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Schedule:

- Week 1 - Create groups, assign one objective per group, review background knowledge, choose experiments that demonstrate the concepts for each objective
  - Objective 1 Experiments
  - Objective 2 Experiments
  - Objective 3 Experiments
- Week 2 - Write scripts and create story boards for a documentary that explains, demonstrates, and applies each objective.
- Week 3 - Conduct experiments, record data, record video of each experiment, gather all needed photos, and create related graphs, charts, graphics, etc.
- Week 4 - Edit projects in iMovie, including graphics, graphs and/or charts, narration, video and photos, background music, titles, and credits.
- Week 5 - Share and celebrate documentaries and submit them to the District Film Festival.

## Lesson Content

Students will work in groups to create documentaries that explain the concepts they have learned in science. Each group will Use Safari to research their assigned science objective and choose an experiment that demonstrates the concepts they have learned. They will use Notes to record important information as they research.

Next they will use Notes or Pages to write a documentary script that explains the concepts in their own words so that their audience can learn the concepts as well. They will then create a storyboard in Notes or Pages that shows how their script will be supported and enhanced using video of their experiment, photos, graphics, graphs, charts, narration, music, and titles.

Each group will conduct their chosen experiment while collecting experiment data using Numbers. They will film their experiment using PhotoBooth or the Camera app on an iPad. They will generate charts and graphs to represent and explain the data collected using Numbers. They will either find royalty-free photos and graphics that represent the concepts they have learned using Safari, or they will create their own using Pages or Keynote.

Finally, they will import all the resources they have filmed, created, or found into iMovie to edit together what they planned in their storyboard. They will use their scripts to record narration for

their documentary and will add titles for clarification and to focus on important points. They will export their finished documentaries to be turned in to the District Film Festival and will use AirPlay to showcase their work for their classmates and teacher.

## Example Project

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Following is an example of what a complete documentary may be like:



Click [HERE](#) to view the video on YouTube.

## Learning Activities

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### *I Do*

Review the concepts that go along with each of the three objectives under 5th grade science standard 1. This could be done using a Keynote presentation, a Kahoot!, a classroom discussion, etc.

Explain the objectives of their project and go through a summary of the project. Show the students a sample documentary so they have an idea of what their finished product may be like.

Divide your class into 3 groups. Assign one of the three objectives to each group, or let the groups choose their objectives.

### *We Do*

Meet with each group individually. With each group, explore various resources that provide further insight into their objective. Use Safari to explore the links provided on [uen.org](http://uen.org):

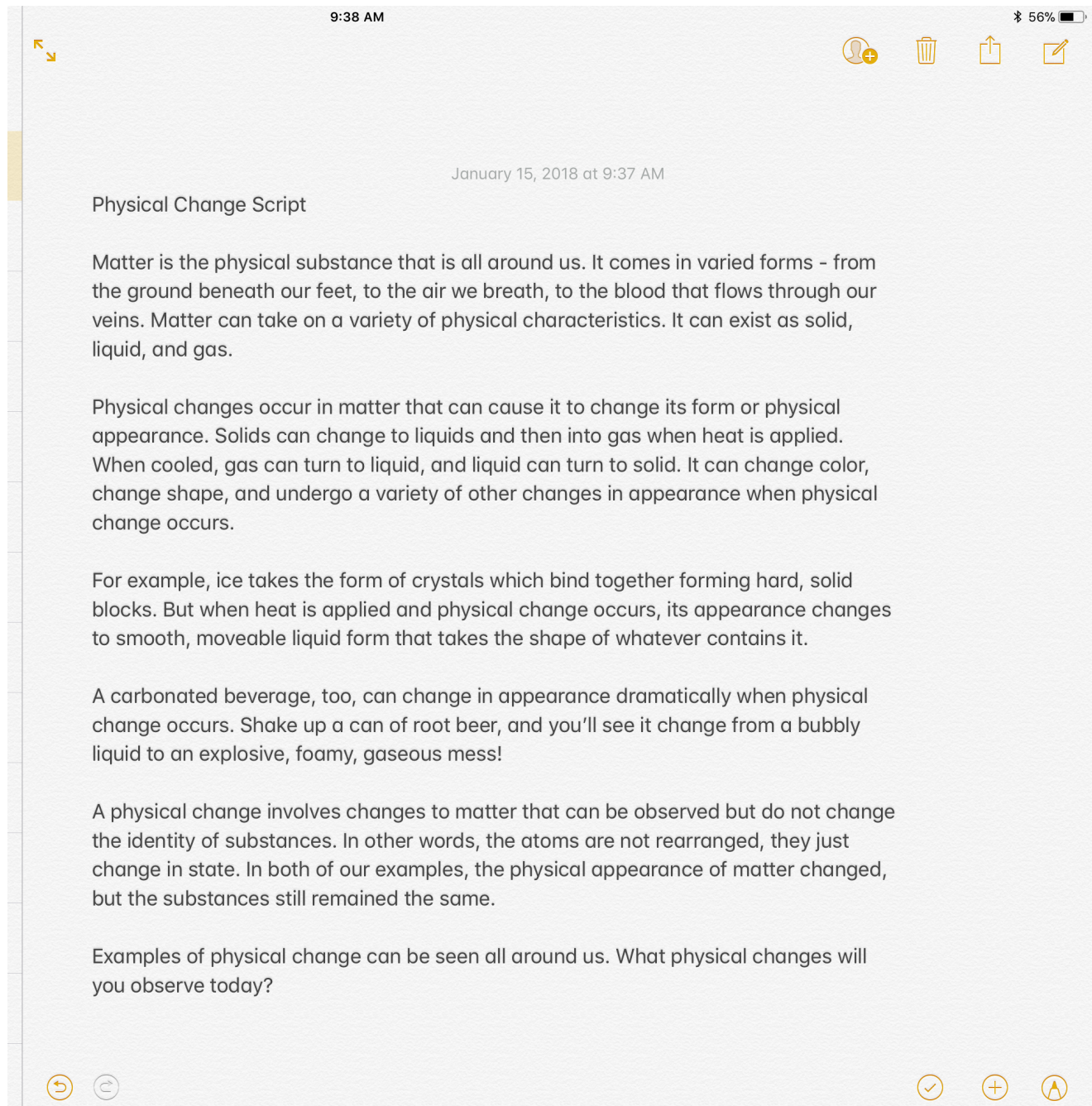
- [Objective 1 Experiments](#)
- [Objective 2 Experiments](#)
- [Objective 3 Experiments](#)

Other resources, such as [Utah's Online Library](#), may be used for research as well. In addition to researching concepts and information, work with the students to select an experiment they will conduct that demonstrate the concepts in their objective. As you research, guide the students in recording important information using Notes. Have them copy and paste the link to their chosen experiment. They may want to create a checklist of materials they will need to conduct their experiment.

### *Y'all Do*

Have each group use Notes or Pages to write a script that explains the concepts in their objective. Their purpose is to explain the concepts in a way that is interesting, informative, and concise. They should write it so that someone who has not heard the information before could understand it. Encourage them to include their own unique voices in their writing while still being clear and focused on the topic. Once their script is written, look over their work and offer suggestions for improvement and edits.

Following is a sample script:



Next, have each group create a storyboard that will help them plan how they will transform their script into a documentary — one that uses audio and visual to more clearly explain and keep the audience's interest. Have the students create their storyboard in Pages, Notes, or Keynote. Following is a sample storyboard:

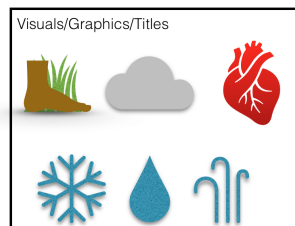
Name: SAMPLE

Storyboard

January 3, 2018

## Matter: Physical Change

Scene # 1 - Introduction



Voiceover Text

Matter is the physical substance that is all around us. It comes in varied forms - from the ground beneath our feet, to the air we breathe, to the blood that flows through our veins. Matter can take on a variety of physical characteristics. It can exist as solid, liquid, and gas.

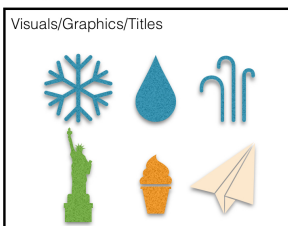
Sound/Music

"Jacaranda", iMovie Jingles

Notes

Change images as they are mentioned in the narration.

Scene # 2



Voiceover Text

Physical changes occur in matter that can cause it to change its form or physical appearance. Solids can change to liquids and then into gas when heat is applied. When cooled, gas can turn to liquid, and liquid can turn to solid. It can change color, change shape, and undergo a variety of other changes in appearance when physical change occurs.

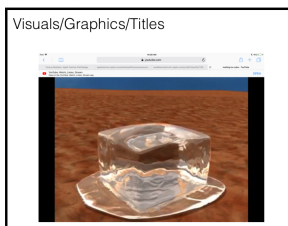
Sound/Music

"Jacaranda", iMovie Jingles

Notes

Change images as they are mentioned in the narration.

Scene # 3



Voiceover Text

For example, ice takes the form of crystals which bind together forming hard, solid blocks. But when heat is applied and physical change occurs, its appearance changes to smooth, moveable liquid form that takes the shape of whatever contains it.

Sound/Music

"Jacaranda", iMovie Jingles

Notes

Use video from experiment showing melting ice.

Adapted from Bernadette Porter's storyboard template

Name: SAMPLE

Storyboard

January 3, 2018

## Matter: Physical Change

Scene # 4



Voiceover Text

A carbonated beverage, too, can change in appearance dramatically when physical change occurs. Shake up a can of root beer, and you'll see it change from a bubbly liquid to an explosive, foamy, gaseous mess!

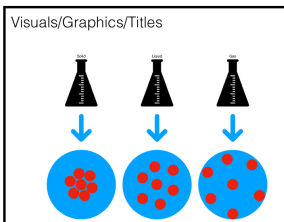
Sound/Music

"Jacaranda", iMovie Jingles

Notes

Use video from root beer experiment

Scene # 5



Voiceover Text

A physical change involves changes to matter that can be observed but do not change the identity of substances. In other words, the atoms are not rearranged, they just change in state. In both of our examples, the physical appearance of matter changed, but the substances still remained the same.

Sound/Music

"Jacaranda", iMovie Jingles

Notes

Create a diagram in Pages of the molecules showing that they are the same, just spread apart.

Scene # 6 — Conclusion



Voiceover Text

Examples of physical change can be seen all around us. What physical changes will you observe today?

Sound/Music

"Jacaranda", iMovie Jingles

Notes

Take photos of various state of matter and physical changes in our environment

Adapted from Bernadette Porter's storyboard template

### *You Do*

Now that the groups have planned and received feedback from you, it is time for them to conduct and film their experiment, create the multimedia they will use in their documentary, and combine and edit it all in iMovie.

Have them review filming, multimedia, sound, and editing tips on the [District Film Festival website](#).

Have each group conduct their experiment while filming. You may want to have one group conduct their experiment at a time so that the class can watch and so you can more easily supervise and offer assistance. They should collect data throughout the experiment using Numbers.

Following the experiment, each group should generate Graphs or charts that display the data collected from the experiment. At this point, they may need to go back and edit their script to include a description of what happened during the experiment and to summarize what the data shows and what was learned.

Each group should create or find graphics to represent the concepts they have learned about. These could be royalty-free graphics and photos found online during their research, or they could be photos taken by the students pointing out real-life examples of the concepts learned, or they could be graphics create by the students in Pages or Keynote.

Each group will use iMovie to create the documentary they outlined in their storyboard. They should import, organize, and edit their photos, graphics, graphs, charts, and experiment video footage. Then, they should add titles to their project for clarification and focus on important points. They will then record themselves reading their script using the voiceover microphone tool in iMovie. They may need to record in pieces to make it easier to align the voiceover with the correct visuals in their project. Finally, they should add music that enhances, but does not detract from, their project. For help using iMovie, visit [Apple's online iMovie guide](#).

When each documentary is completed, it is a good idea to preview the projects and offer feedback and suggestions before their final project is due, particularly if this is the first film the students have made. When the final draft is ready, have the students export the file to the desktop. Have them [submit their projects to the District Film Festival](#), and then hold a viewing party with your whole class. Have the students AirPlay their documentaries for the class to view. Popcorn is recommended.



## Assessment

Students documentaries will be assessed using the following rubric:

Criteria	Ratings	Points
Length of Film	Film is 5 minutes or less	2
Planning	Film shows evidence of effective planning (scripting & storyboarding)	2
Topic	Film reflects accurate, specific, purposeful information that is extended to fully explain the topic	4
Organization	Film is well organized with a clear beginning, middle, and end and contains effective transitions	2
Quality (sound, lighting, camera work)	Sound, lighting, and camera work are clean and consistent	2
Photos, Video, Narration, & Music	Images and sounds create a distinct atmosphere or tone and communicate information clearly	4
Titles & Graphics	Titles and graphics are clear, readable, well composed, and creatively employed	4
Editing	Editing is sharp and concise with good beginnings and endings	2
Credits	Credits include complete citation/permission information for all multimedia borrowed for the film	2
Total		<b>24</b>

## Reflections & Closing Thoughts

Filmmaking can seem like a daunting project the first couple times it is done in the classroom. Consider starting with a smaller, more simple project first so that the students can get used to the basics of iMovie as well as the planning process and filming techniques. In the end, filmmaking is worth the time and effort because filmmaking in the classroom increases students engagement and learning. The following graphic explains this in greater detail:



## Resources

- <https://www.uen.org/core/core.do?courseNum=3050>
- <http://cnyns.org.csdfilmfestival>

## For more information:

For more information about filmmaking and the Canyons District Film Festival, visit <http://cnyns.org.csdfilmfestival>.

