

# The State of Science Education in the US

And What the CO<sub>2</sub> Coalition is Doing About It

# School Choice in America

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- Parents are becoming more concerned about their children's education
- There are 31 states plus DC and Puerto Rico that have school choice legislation
- 45 states plus DC permit public charter schools
- 50 states plus DC permit magnet schools
- 50 states plus DC permit homeschooling

*Source: <https://www.federationforchildren.org/school-choice-in-america/>*

# Surge in Homeschooling

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- 3.7 million students are currently homeschooled in US (parentingmode.com)
- North Carolina, Florida and Georgia have highest number of homeschooled students
- The age group of most homeschooled children is middle school

Picture Source: <https://www.kiplinger.com/personal-finance/spending/601143/the-finances-of-homeschooling-what-to-expect>

# Why Homeschool for Science Education?

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- Public schools no longer teach the scientific method
- Public schools no longer teach critical thinking schools
- Public schools are more interested in indoctrination than education

Picture source: MiguelS1981, CC BY-SA 4.0  
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Wikimedia Commons,  
[https://commons.wikimedia.org/wiki/File:LABORATORIO\\_FLEPP.jpg](https://commons.wikimedia.org/wiki/File:LABORATORIO_FLEPP.jpg)



# Next Generation Science Standards

- Used by 45 states as basis for their education standards on science
- Does not include the scientific method, but instead emphasizes modeling
- Does not include critical thinking skills





SEARCH

## Read the Standards

The Standards / Read the Standards

### KEYWORD SEARCH

scientific method

### DISPLAY ONLY SELECT THE APPROPRIATE CHECKBOX(ES) TO RESTRICT RESULTS.

DCI ARRANGEMENTS  PERFORMANCE EXPECTATION  TOPIC ARRANGEMENTS

Filter by

### GRADE

Middle School (6-8)

### PRACTICE

Select

### DISCIPLINARY CORE IDEA

Select

### DISCIPLINE

2 selected

### CROSSCUTTING CONCEPT

Select

SUBMIT

RESET

STANDARDS BY DCI

DOWNLOAD DCI ARRANGEMENTS  
(4 MB)

STANDARDS BY TOPIC

DOWNLOAD TOPIC  
ARRANGEMENTS (5 MB)

SEARCH EVIDENCE STATEMENTS



SEARCH

# What Happened to the Scientific Method?

- The scientific method is no longer taught in most public schools
- Only component steps are taught one at a time

# Current Pedagogy on Science Teaching

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**According to Jonathan Osborne, Prof. Emeritus of Education at Stanford:**

**The goal of science is the achievement of consensus.**

Note that learning the scientific method, designing an experiment that tests a hypothesis, and accurate analysis of data are not included.

Source: <https://www.cyprus-ceo.com/22664/how-to-beat-bad-science/>



# National Science Teachers Association Position Statement on Climate Change

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- No scientific controversy exists regarding basic facts of climate change; any controversies are based on social, economic, or political science
- Debates and false-equivalence arguments are not demonstrably effective science teaching methods
- Apparent controversies come from social, economic, or political domains, not from the scientific community
- Students must distinguish between opinions and evidence, debate and scientific denial

Source: [https://static.nsta.org/pdfs/PositionStatement\\_ClimateScience.pdf](https://static.nsta.org/pdfs/PositionStatement_ClimateScience.pdf)



# CO<sub>2</sub> Coalition Expelled from NSTA Convention



- Members from the CO<sub>2</sub> Coalition attended the convention in March 2023
- We distributed educational materials and our document that challenges the NSTA's position on climate change (<https://co2coalition.org/publications/challenging-the-nsta-position-on-climate-change/>)
- We were kicked out on the second day, but distributed many materials before then

# What is the CO<sub>2</sub> Coalition and Why Do We Care About Science Education?

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- It was established in 2015 as a non-partisan educational foundation
- Its purpose is education about the important contribution made by carbon dioxide
- Seeks to strengthen the understanding of the role of science and the scientific process in addressing complex public policy issues



[CO2Coalition.org](http://CO2Coalition.org)

# CO<sub>2</sub> Coalition Members

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- There are currently 146 members
- These include scientists, policymakers, economists, engineers, computer scientists, and energy experts
- Members include William Happer, Patrick Moore, Nobel Laureate John Clauser
- To learn more about our members, visit the [Members page](#) on our website



# CO<sub>2</sub> Learning Center

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*[CO2LearningCenter.com](http://CO2LearningCenter.com)*

- Formed in 2019 due to concerns of incorrect information about CO<sub>2</sub> being taught in public schools
- Goals are to provide:
  - Information on importance of CO<sub>2</sub> and critical thinking skills
  - Useful science educational materials for students and educators

# CO<sub>2</sub> Learning Center Team



- Their backgrounds include physics, chemistry, geology and more
- Most hold PhDs or advanced degrees in applied sciences
- Their goal is to promote scientific thought
- To learn more about our team, visit the About page at [CO2LearningCenter.com](http://CO2LearningCenter.com)

# Materials Available

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- Three books are currently available, two more will be available soon
- Five free videos available on the website with one coming soon
- Comprehensive lesson plans for all books and videos
- All are illustrated in manga and anim  style by Brazilian artist Thiago Hellinger



# Once Upon a Time

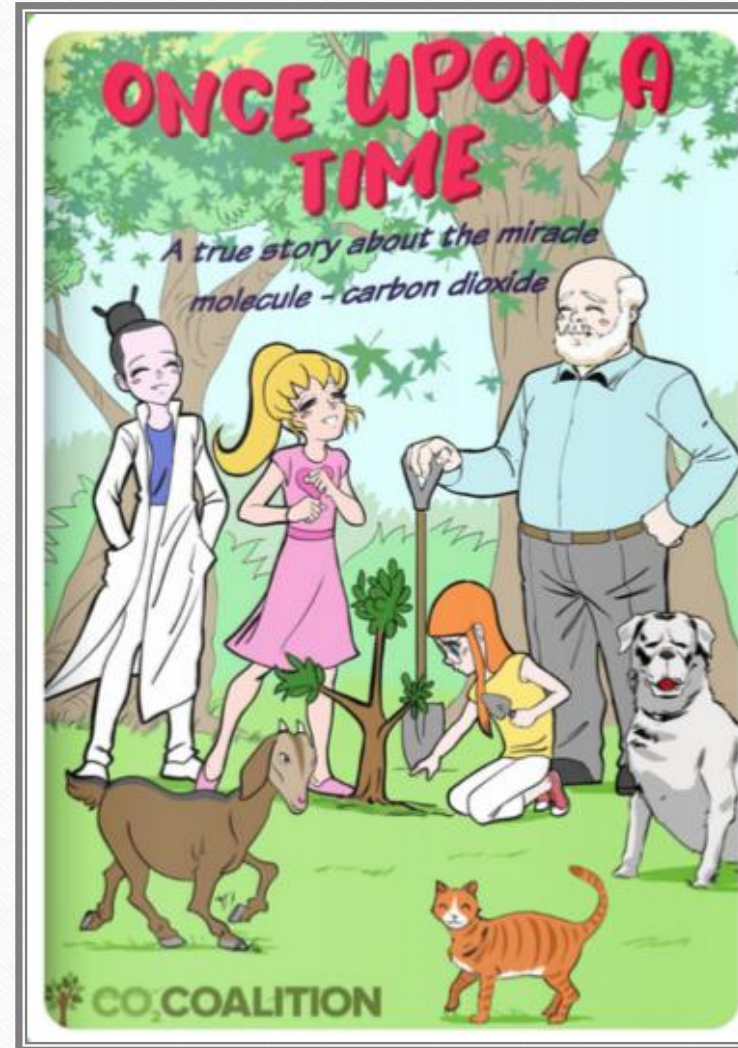
The True Story About the  
Miracle Molecule—Carbon Dioxide

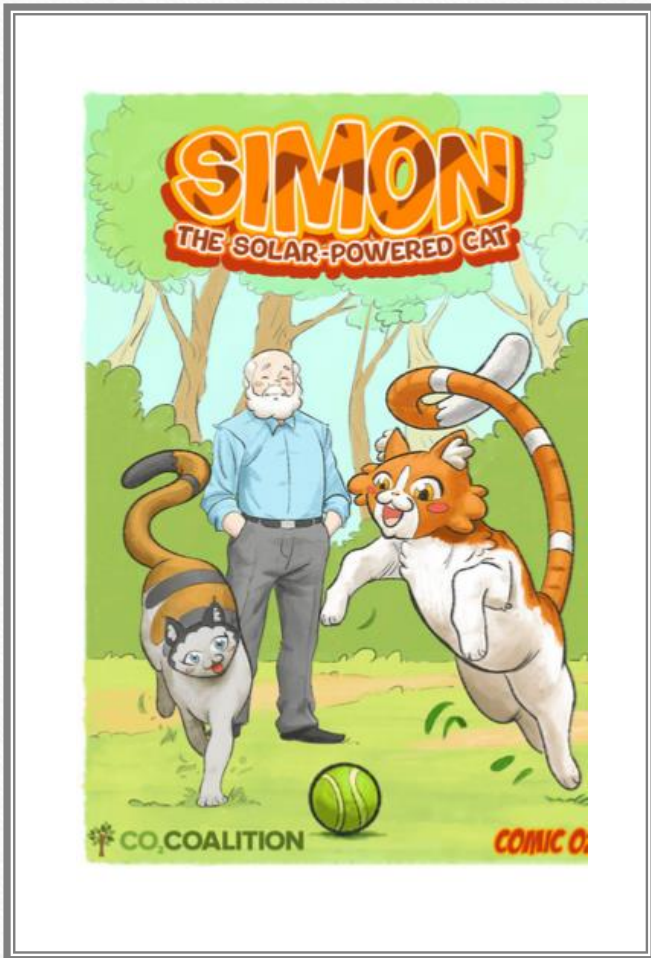
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The first book in a series, *Once Upon a Time* teaches students:

- What is CO<sub>2</sub>?
- Why CO<sub>2</sub> is necessary for life on Earth?
- Increasing CO<sub>2</sub> makes plants grow faster.

Note: All books are written by Dr. Gordon Fulks, Chair of the CO<sub>2</sub> Education Committee and a retired astrophysicist





# Simon: The Solar-Powered Cat

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The second book in a series that teaches students:

- Plants store energy from the sun.
- Photosynthesis uses carbon dioxide and water to make food.
- Food contains energy from the sun, so animals are solar-powered.



# The Magic Mirror:

## Reflections on Recycling

The third book in a series that teaches students:

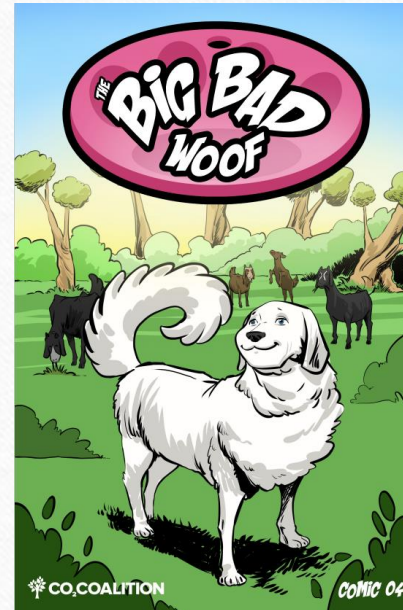
- Nature is the most important recycler
- Natural and man-made processes break all materials back down into carbon dioxide and water



# Books Coming Soon!

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- The Big Bad Woof -- discusses the basics of climate
- Mystery of the Night Raiders -- discusses the scientific method





# Gases in the Air

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Video that teaches students:

- Major components of air
- Photosynthesis is instrumental in the existence of  $O_2$  and  $CO_2$

# Gases Come Alive

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Video that teaches students:

- The major gaseous components of air
- How these components are used by life





# Where the Gases Come From

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Video that teaches students:

- How  $\text{CO}_2$  is formed
- What percentage of the air is  $\text{CO}_2$
- How  $\text{CO}_2$  is used by plants

# The Magic Molecule

## Part I

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Video that teaches students:

- What a water molecule is
- Properties of water



# The Magic Molecule

## Part II

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Video that teaches students:

- how water plays an important role in moving heat around the Earth
- how water helps make our weather and climate livable



# Lesson Plans and Activities

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Each book and video has a unique lesson plan which includes:

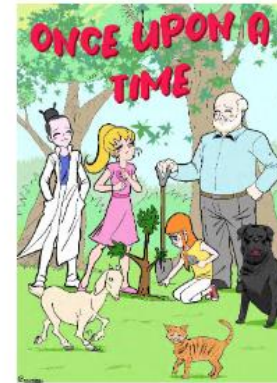
- Learning standards and goals
- Background information for instructor
- Suggested activities
- Formative and summative questions



## Book One Lesson Plan

### *Once Upon a Time:*

*A True Story about the Miracle Molecule Carbon Dioxide*



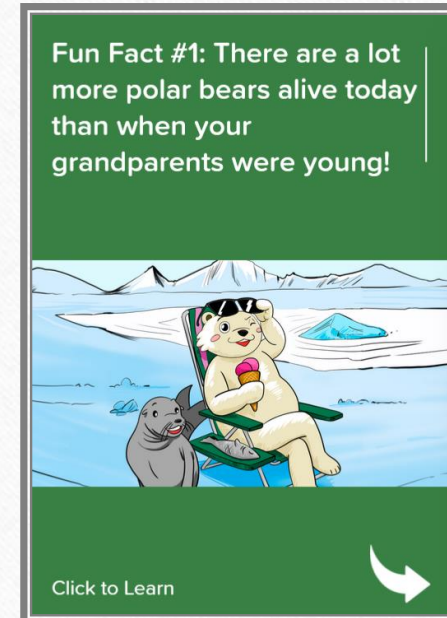
*This lesson plan was produced by the CO<sub>2</sub> Learning Center, a project of the CO<sub>2</sub> Coalition*



# Fun Facts

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- There are 10 fun facts “cards” – and more to come!
- Each card includes more information and source for the fact



# Climate Quiz

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- Eighteen commonly held misconceptions are given
- Clicking “Reveal answer” shows the correct statement followed by a scientifically-credible source

**Polar bear populations are in decline.**

Agree

Disagree

Unsure

Reveal answer