

# OXYGEN CYCLE

Dice Simulation  
with Writing Connection

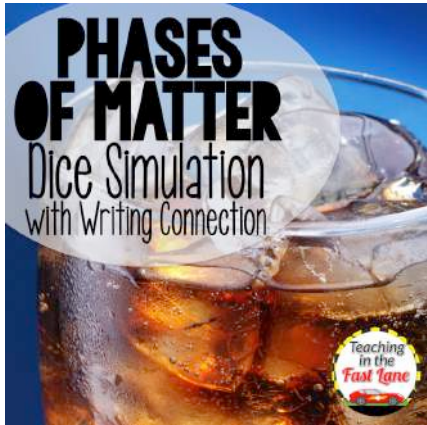




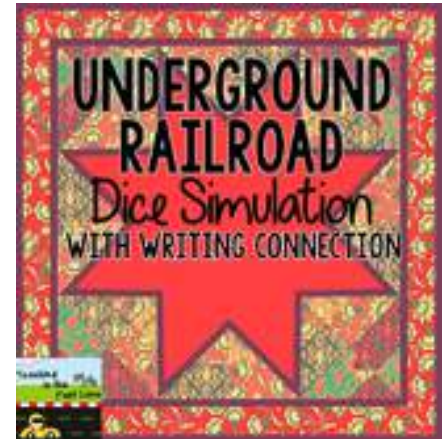
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# Teaching in the Fast Lane

## FOR MORE SIMULATIONS!



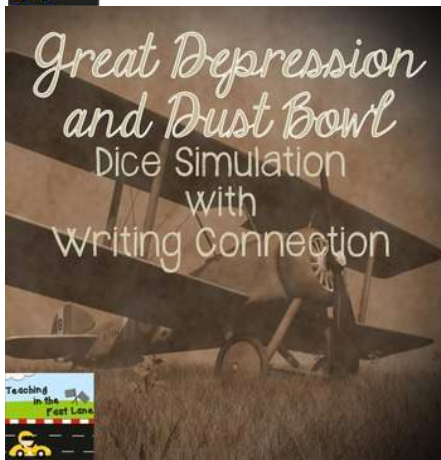
**TURKEY IN HIDING**  
Dice Simulation  
AND WRITING CONNECTION



**CIRCULATION OF A DOLLAR**  
Dice Simulation  
AND WRITING CONNECTION



**REINDEER GAMES**  
Dice Simulation  
AND WRITING CONNECTION



# MANY MORE TO COME!

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# INCLUDED IN THIS PRODUCT:

- Teacher and student directions for simulation
- Recording sheet
- Sample recording sheet
- Teacher directions for narrative
- Sample narrative based on sample recording sheet
- Rubric for narrative
- Signs for each location with directions
  - For larger classes, I would make multiple copies of each poster and directions, so that lines at each don't get too long.

**\*\*You will need six dice to complete this simulation. I recommend the large foam dice that can be found at the dollar store.\*\***

# NOTE TO TEACHER

This is a simulation meant to reinforce student's knowledge of the oxygen cycle. This simulation is a great way to connect science and writing within your curriculum.

# TEACHER DIRECTIONS FOR SIMULATION

- Print and laminate each of the location signs and student directions.
- Hang the location signs and student directions around your classroom and place one die by each poster.
- Hand out recording sheets to students and review the directions with them:
  - Directions are found on the next page.
- Monitor students as they travel around the classroom during the simulation and complete their recording sheet.
- Assign students to their starting location.
  - I do this by numbering students off #1-6 and assign them to the following locations:
    1. Breathing
    - 2. Photosynthesis
    - 3. Decomposing
    4. Phytoplankton
    - 5. Combustion
    - 6. Sunlight

# DIRECTIONS FOR SIMULATION

- After each student has their starting location, they should begin to circulate.
- At each location, roll the die and read the event associated with the number rolled. Use the underlined words to record your progress and travel to the next location.
- Once you have established your location, travel there quietly and wait in line to roll the die.
  - If your directive is to stay in the same location, then go to the end of the line and take another turn rolling the die.

Students should continue to travel from location to location until they complete their recording sheet or time is up.

- I would recommend allowing students to complete the simulation for about 10-15 minutes.



# OXYGEN CYCLE FACT SHEET

- Ways oxygen is used:
  - Breathing - animals, including humans, take in oxygen when they breathe and release carbon dioxide
  - Rusting - oxidation of metals occurs when water and oxygen are available causing a red flaky substance
  - Decomposition - when animals and plants die they decompose, using oxygen and releasing carbon dioxide
  - Combustion - can sometimes be ignited when oxygen is available giving off carbon dioxide
- Ways oxygen is released:
  - Photosynthesis - plants, including microscopic phytoplankton, take in carbon dioxide, water, and sunlight and release oxygen
  - Sunlight - oxygen can be released by the breakdown of water molecules in the atmosphere
- Most of the world's oxygen is being stored in oxide minerals and is unavailable for use in the oxygen cycle.



**BREATHING**

Mentally



# BREATHING

1. Breathe out carbon dioxide that is taken in by phytoplankton.
2. Your carbon dioxide is taken in by a plant to undergo photosynthesis.
3. Breathe out carbon dioxide that is taken in by phytoplankton.
4. Your carbon dioxide is taken in by a plant to undergo photosynthesis.
5. Breathe out carbon dioxide that is taken in by phytoplankton.
6. Your carbon dioxide is taken in by a plant to undergo photosynthesis.

# PHOTOSYNTHESIS



# PHOTOSYNTHESIS

1. You are released as oxygen and breathed in.
2. You are released as oxygen and breathed in.
3. You are released as oxygen and used to start a combustion process.
4. You are released as oxygen and breathed in.
5. You are released as oxygen and used to start a combustion process.
6. You are released as oxygen and used to start a combustion process.

# DECOMPOSTING





# DECOMPOSING

1. Give off carbon dioxide that is taken in by phytoplankton.
2. Your carbon dioxide is taken in by a plant to undergo photosynthesis.
3. Give off carbon dioxide that is taken in by phytoplankton.
4. Your carbon dioxide is taken in by a plant to undergo photosynthesis.
5. Give off carbon dioxide that is taken in by phytoplankton.
6. Your carbon dioxide is taken in by a plant to undergo photosynthesis.

# COMBUSTION

prevention



# COMBUSTION

1. Give off carbon dioxide that is taken in by phytoplankton.
2. Your carbon dioxide is taken in by a plant to undergo photosynthesis.
3. Give off carbon dioxide that is taken in by phytoplankton.
4. Your carbon dioxide is taken in by a plant to undergo photosynthesis.
5. Give off carbon dioxide that is taken in by phytoplankton.
6. Your carbon dioxide is taken in by a plant to undergo photosynthesis.

# SUNLIGHT



one



# SUNLIGHT

1. You react with water vapor and release oxygen to be breathed in.
2. You react with water vapor and release oxygen to aid in combustion.
3. You react with water vapor and release oxygen to aid in decomposition.
4. You react with water vapor and release oxygen to be breathed in.
5. You react with water vapor and release oxygen to aid in combustion.
6. You react with water vapor and release oxygen to aid in decomposition.



# PHYTOPLANKTON

the view

# PHYTOPLANKTON

1. You are released as oxygen and breathed in.
2. You are released as oxygen and breathed in.
3. You are released as oxygen and used to start a combustion process.
4. You are released as oxygen and breathed in.
5. You are released as oxygen and used to start a combustion process.
6. You are released as oxygen and used to start a combustion process.

Name\_\_\_\_\_ #\_\_\_\_\_ Date\_\_\_\_\_

# OXYGEN CYCLE DICE SIMULATION

1	Begin	1 1	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	



# SAMPLE RECORDING SHEET

## OXYGEN CYCLE DICE SIMULATION

1	Begin as sunlight	11	Breathed in
2	Phytoplankton	12	Photosynthesis
3	Combustion	13	Combustion
4	Phytoplankton	14	Photosynthesis
5	Breathed in	15	Breathed in
6	Photosynthesis	16	Photosynthesis
7	Breathed in	17	Breathed in
8	Photosynthesis	18	Phytoplankton
9	Combustion	19	Breathed in
10	Phytoplankton	20	Phytoplankton

# TEACHER DIRECTIONS FOR NARRATIVE

- After completing the dice simulation, students are ready to write a narrative from the point of view of oxygen traveling through the oxygen cycle.
  - Students should use their recording sheet (the locations they visited) to write a narrative piece about their adventure.
  - By following their recording sheet and adding details, students will have a narrative describing their adventure. It is also important for students to use their science vocabulary in the narrative.
- It is alright for students to not use all of the locations on their recording sheet, but they should include at least five events.
- A rubric for the narrative is included

# SAMPLE NARRATIVE

Floating high above the earth as part of a cloud I enjoyed my time with my hydrogen buddies forming water vapor. Hydrogen is a very simple kind of fellow, but at least I can be assured that they won't talk behind my back. They just aren't capable.

After many days of sight seeing from the sky, I felt it. The warm sensation of the sun's rays hitting my back felt great at first, but then I noticed the change it was causing. Before I knew it my hydrogen friends and I were drifting farther and further apart. Suddenly I realized I was on my own and drifting closer and closer to Earth.

As I reached the surface I felt myself being sucked into a large mammal's nostrils. The sensation of running through the mammal's blood was a thrill. I traveled through their lungs and through the bloodstream to the extremities of their body. Once I reached the lungs again I was exhaled, but feeling totally changed.

I emerged as carbon dioxide. I didn't like this new feeling, so I started to seek out a plan to turn me back to my original form. My search was soon over and I happened upon an ocean full of phytoplankton. Those little guys sure do keep busy. Did you know that they are responsible for the majority of photosynthesis on this planet?

The phytoplankton made quick work of releasing me as oxygen back into the atmosphere. I longed to be coursing through the veins of another animal, and set off in my search to make that happen.

# RUBRIC FOR OXYGEN CYCLE DICE SIMULATION NARRATIVE

	1 point	3 points	5 points
<b>Grammar, Mechanics, &amp; Spelling</b>	Many mistakes that make it difficult for the reader to understand.	A few mistakes, but the reader can still understand.	Only 1-2 mistakes and the reader can understand.
<b>Organization and Coherence</b>	The story is not in a sense of logical order of events.	The story follows order of events, but lacks coherence.	The story follows a logical order and is coherent.
<b>Events from recording sheet</b>	Includes 3 or less events from the simulation.	Includes 4-5 events from the simulation.	Includes 6 or more events from the simulation.
<b>Details and Scientific Vocabulary</b>	No details are added. Academic vocabulary is not present.	A few obvious details are added along with some academic vocabulary.	Many imaginative details are added. Clear use and knowledge of academic vocabulary is present.



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