

ADVANCED LEARNING LABS

Collaboration between NC Department of Public Instruction and AIG Teachers across the state

TO ENGAGE, ACTIVATE, AND GROW OUR STUDENTS

GRADES
10-12

Movement



ENGLISH LANGUAGE ARTS

The annual migration of North America's monarch butterfly is a unique and amazing phenomenon. The monarch is the only butterfly known to make a two-way migration as birds do.

The "Monarch Highway" that runs north-south through America earned its name because of the habitat it provides. What/who are the key players on the highway?

Why do these butterflies migrate to South America? View this link to answer these questions and learn more about the Monarch's journey:

https://www.fs.fed.us/wildflowers/pollinators/Monarch_Butterfly/migration/index.shtml

Write a poem about the roles of the pollinators on the Monarch Highway. Include imagery and other examples of figurative language.



SOCIAL STUDIES

The United States had many reasons for going to war in 1812: Britain's interference with its trade and impressment of its seamen; Americans' desire to move into Indian, British, and Spanish territories; aspirations to conquer Canada and end British influence in North America; and upholding the nation's sovereignty and vindicating its honor. Visit the "1812: A Nation Emerges" online exhibit here: <http://npg.si.edu/exhibit/1812/>

Analyze information about the War of 1812 in order to identify which people, events, terms, and concepts are most important to understanding the era.

Create a multimedia presentation on the War of 1812. Include visual images, list of key terms and people, and links to where your peers can find more information. Be sure your presentation reflects your complete understanding of the era.



SCIENCE

The carbon cycle is vital to life here on Earth. Nature keeps our carbon levels balanced so our planet remains able to sustain life. By burning fossil fuels, humans have added more carbon to the atmosphere leading to climate change and global warming.

This video uses an animated machine to show how carbon moves around the Earth's surface – from the atmosphere to rocks: <https://www.youtube.com/watch?v=IWEvBLIUa2E&app=desktop>

Write a skit or journal entry from the point of view of a carbon atom. Tell about your journey over thousands of years on planet Earth. Include a monologue about why it is important for humans to respect and look after you.



MINDFULNESS

Participating in physical activity is an important health maintenance strategy for people of all ages. According to the Mayo Clinic, "Exercise delivers oxygen and nutrients to your tissues and helps your cardiovascular system work more efficiently." Physical activity can be so much more than walking or running. This link provides many ways to move and become healthier: <https://www.healthlinkbc.ca/health-topics/aa165656>

Create a Personal Exercise Plan (PEP). Make sure your plan includes a variety of different types of exercise to keep you active a minimum of 30 minutes 5 days a week. After one month, analyze the benefits of your PEP. How do you feel - mentally and physically? Create a list of differences that you can see and feel.



LOGIC PUZZLE

Plumbing can be traced back to 3,000 B.C. when the Indus River Valley civilization used earthen plumbing pipes to provide moving water. How much water is moved in our pipes today?

Use the following clues to solve the puzzle:

- The cold faucet in my bath lets the water in at the rate of 15 liters per minute.
- The hot faucet fills the bath at the rate of 10 liters per minute.
- The plug hole lets the water out of the bath at the rate of 12 liters per minute.
- The bath holds a maximum of 520 liters.
- I turn both faucets on, but forget to put the plug in.

How many minutes does it take for the bath to overflow?



FIELD STUDIES

The ocean never stands still. Even in a quiet marina, you can see the water is slowly moving. What causes the coral to wave or the anemone to sway? Ocean currents.

Travel under the sea to learn more about currents, gravitational pull, and tides: <https://oceanservice.noaa.gov/podcast/apr14/mw123-currents.html>

What are some questions you still have about the movement of the ocean? Analyze what would happen to sea life if the ocean was stagnant.

Create an ocean scene that depicts the movements of the ocean.



RESEARCH EXPLORATIONS

"Nothing happens until something moves"
- Albert Einstein

From Volcanologists to Solar Physicists, there are careers in air and space that people don't know exist. Whether it is the movement of human invention or the explosion of a supernova light years away, many careers revolve around this concept.

Research careers in aviation and space using this link: <https://airandspace.si.edu/highlighted-topics/careers>

Create a visual representation of 10 careers that interest you and relate to air and space. What steps do you need to take now to ensure your future success within this field? What courses should you take at your high school, what research opportunities can you do now to explore the career you are interested in.



MATH

Vehicles have kinetic energy (KE); as you increase your vehicle's speed, the KE increases. The greater the KE ($KE = 0.5 \times mv^2$), the greater the effort required to stop. KE increases exponentially; if you double your vehicle's speed, your vehicle's KE increases by four times, therefore, stopping distance will be multiplied by four.

If you are traveling 60 mph your stopping distance is 180 feet. What is your stopping distance at 65 mph? 75 mph? How does the mass of a vehicle relate to the stopping distance?

Pick 5 vehicles and determine the KE of each when traveling at the same speed. Rank these from most safe to least - be sure to justify your order. What would you consider if you choose to buy the least safe car? What car would you recommend for an inexperienced driver and why?



North Carolina Department of
PUBLIC INSTRUCTION



Movement Reference Guide

K-1 Logic Puzzle:

Solution: Pick up the 2nd glass and pour its contents into the 5th class and set it back down in its place empty.

6-7 Logic Puzzle:

Solution example:

1. Start trip with 1000 bananas
2. Travel 200 miles and have 800 left. Leave 600 at 200 mile point, keep 200 for 200 mile trip back to start.
3. Pick up another 1000 bananas
4. Travel 200 miles and have 800 left. Pick up 200 from stashed and carry 1000 and have 400 more stashed.
5. Travel an additional $333\frac{1}{3}$ miles, you're left with $666\frac{2}{3}$, stash $333\frac{1}{3}$ there ($533\frac{1}{3}$ mile point), you have $333\frac{1}{3}$ left
6. Travel back $333\frac{1}{3}$ miles to 200 mile point and pick up 200 stashed (leaving 200 still at 200 mile point), go back the other 200 miles.
7. Pick up another 1000
8. Travel to 200 mile point, leaving 800 bananas, pick up remaining 200 stashed
9. Pick up 1000 bananas travel $333\frac{1}{3}$ miles to $533\frac{1}{3}$ mile point, you're left with $666\frac{2}{3}$ bananas.
10. Pick up all $333\frac{1}{3}$ that were stashed
11. You are back at 10
12. Make remaining $466\frac{2}{3}$ mile trip,

$1000 - 466\frac{2}{3} = 533\frac{1}{3}$ bananas left at the end.

10-12 Logic Puzzle:

Solution: 40 minutes <https://www.mathsisfun.com/puzzles/baffling-bath-water-solution.html>

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K-12

Movement NC Standards Alignment

Grade Span	English/ Language Arts	Social Studies	Science	Math
K-1	L.1.5	K.G.1.3 K.G.1.2 1.G.1.3 K.G.2.2 K.G.2.2 1.G.1.2	1.P.1.2 1.P.1.3	NC.1.G.1
2-3	RL.3.3	3.G.1.4 3.G.1.3	3.P.1.1	NC.3.NBT.2
4-5	SL.5.4	5.C.1.3 5.B.1.2	4.L.2.2	NC.5.NBT.1
6-7	6-8 Grammar Skill	6.G.1.2 6.E.1.1	6.P.1	NC.6.NS.5 NC.6.NS.6
8-9	RL.9-10.10	8.H.3.1 8.G.1.4	8.L.1.2	NC.M1.F-IF.7 NC.M2.-CED.2 NC.M2.-CED.3 NC.M2.A-REI.1
10-12	W.9-10.2	AH1.H.6.2	EEn.2.5.5	NC.M1.A-REI.1