

# ADVANCED LEARNING LABS

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

TO ENGAGE, ACTIVATE, AND GROW OUR STUDENTS

GRADES

8–9

## Systems



### ENGLISH LANGUAGE ARTS

In 1824 Speaker Henry Clay of Kentucky spent two days in Congress making a speech entitled, "In Defense of the American System." This American System, which Clay proposed, was the first government-sponsored attempt to invigorate the economy.

Read and annotate Clay's speech: <https://www.senate.gov/artandhistory/history/resources/pdf/AmericanSystem.pdf>

For support annotating texts, visit this site: <https://bit.ly/2WCa9ae>

Delineate and evaluate the argument and specific claims in the speech using the graphic organizer: <https://bit.ly/2Cv93X3>



### SOCIAL STUDIES

A person with a job makes money, but in most cases, s/he also spends some of that money for goods or services that are needed or desired. A budget is a system or plan for how the money will be spent. Budgeting allows you to determine how much money is required for needs and how much is left for wants.

Think about five goods or services that you would like to be able to afford. Research to discover how much each will cost, including taxes, and shipping, if applicable. Make a plan for how much you would have to make and save each week and for how long to purchase each of the items.

After drafting the budget, are there any of these items that you have decided are not worth the costs?



### SCIENCE

In physical and chemical changes:

- particles don't disappear or get created; their arrangements change.
- all the matter must be accounted for. Matter does not turn into or appear from energy.
- there is no change in mass when a substance moves in and out of the gas state.

Read each of the closed system scenarios in the link: <https://docs.google.com/document/d/18761kinKEgWrZfxDRNFrV-UINhGSjrQ6lXEtIkLXWkw/edit?usp=sharing>

There may appear to be an apparent change in mass, but reflect on the scenario to determine an alternative hypothesis to explain what is happening.



### MINDFULNESS

Stress is very damaging to the systems of the body. Read the article to better understand the effect of stress on your body: <https://bit.ly/3eh5ikM>

Could you go a whole day without your phone? Devices such as smartphones contribute to our stress. They distract us from being present, aggravate our worries, and contribute to FOMO (fear of missing out). Pay attention to how time on devices makes you feel. Stay away from technology for one hour. What will you do with that time? Could you spend it with others? Could you take a walk or read? Try something different like cooking, working in the yard, or organizing a family game night.

Journal about your time away from devices. What did you do? Where did you go? Did you accomplish something you otherwise would not have? Did you feel less stressed and healthier?



## LOGIC PUZZLE

Would you like to become better at solving grid-type logic puzzles? Use the information in the video to better understand how a logic puzzle uses deductive thinking to solve: <https://www.youtube.com/watch?v=loyetRWK3VU>

Use the link to print and solve a logic puzzle about dinosaurs: [https://docs.google.com/document/d/1nXfhvVmypltJPv1c0EdT1mpBwH98Qxi\\_mu1C9dNext0/edit?usp=sharing](https://docs.google.com/document/d/1nXfhvVmypltJPv1c0EdT1mpBwH98Qxi_mu1C9dNext0/edit?usp=sharing)

For more fun, try solving some using the online site Brainzilla: <https://www.brainzilla.com/logic/logic-grid/>



## FIELD STUDIES

Frontal systems, also called weather fronts or just fronts, are boundaries between air masses of different temperatures. There are four kinds of fronts: cold fronts, warm fronts, stationary fronts (i.e., warm or cold fronts that are not moving), and occluded fronts (i.e., when a cold front takes over a warm front). Learn more about weather fronts: <https://bit.ly/2W5fVRs>

For two weeks, use radio, television, newspaper, or internet sources to learn about the daily forecast and weather. In a chart format of your choice, keep track of the temperature and precipitation each day and whether there is a front approaching, present, or departing. How do the fronts seem to impact temperature and precipitation?



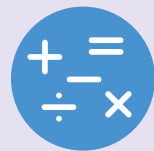
## RESEARCH EXPLORATIONS

The Earth we live on is a small part of a larger system called the Solar System. Explore this complex system using the following links:

- <https://solarsystem.nasa.gov/>
- <https://spaceplace.nasa.gov/>
- <https://www.jpl.nasa.gov/missions/>

Use your research to write a poem about the Solar System. Your poem should include at least one fact you already knew and one fact you learned. Visit the following link to help you determine the style of poem you would like to write: <https://examples.yourdictionary.com/what-are-different-types-of-poems.html>

For more inspiration, visit the NASA Space Poetry site and read some poems by NASA scientists: <https://www.jpl.nasa.gov/edu/learn/slideshow/nasa-space-poetry/>



## MATH

Nora was selling tickets at the high school dance. At the end of the evening, she picked up the cash box and noticed a dollar lying on the floor next to it. She said, "I wonder whether the dollar belongs inside the cash box or not."

|                   |                       |                    |
|-------------------|-----------------------|--------------------|
| Number of tickets | Individual (1 ticket) | Couple (2 tickets) |
| Price             | \$5                   | \$8                |

Nora counted \$800 in the cash box. She had ticket stubs for the 191 students in attendance. Does the dollar belong inside the cash box or not?

Set up and use a system of equations to explain your thinking.



North Carolina Department of  
**PUBLIC INSTRUCTION**



# ADVANCED LEARNING LABS

Collaboration between NC Department of Public Instruction and AIG Teachers across the state  
TO ENGAGE, ACTIVATE, AND GROW OUR STUDENTS

---

GRADES  
**K-12**

## Systems Reference Guide

For more information on creating infographics, visit this site: <https://www.canva.com/create/infographics/>

### **K-1 Logic Puzzle:**

Solution: Erasers=\$.25; Stickers= \$1.50, Peppermints= \$.50

### **6-7 Logic Puzzle:**

Solution: Adam must pull out 40 to guarantee he pulls out two black socks. He could pull out 21 blue plus 17 red plus 2 black.

### **8-9 Logic Puzzle:**

Solutions can be found at the Brainzilla site: <https://www.brainzilla.com/logic/logic-grid/>

### **10-12 Logic Puzzle:**

Solutions:

1. The answer is three rotations in total. Two because of the ratio 10:5, one more because of the movement of the smaller cogwheel. <https://www.puzzleprime.com/brain-teasers/insight/cogwheels/>

2. After 18 rotations of the smaller gear and 11 rotations of the bigger gear, the marked teeth will be together again. <https://aplusclick.org/t.htm?level=12;q=3938>

# ADVANCED LEARNING LABS

Collaboration between NC Department of Public Instruction and AIG Teachers across the state  
TO ENGAGE, ACTIVATE, AND GROW OUR STUDENTS

GRADES  
**K-12**

## Systems NC Standards Alignment

| Grade Span   | English/<br>Language Arts | Social Studies  | Science   | Math                            |
|--------------|---------------------------|---|-----------|---------------------------------|
| <b>K-1</b>   | L.1.5                     | K.C&G.1.1<br>1.C&G.1<br>1.C&G.1.1<br><b>K.C&amp;G.1</b><br><b>1.C&amp;G.1.1</b> | 1.E.1     | NC.1.NBT.7                      |
| <b>2-3</b>   | RI.3.5                    | 3.C&G.1.3<br><b>3.C&amp;G.1.1</b>   | 3.L.2.2   | NC.3.NBT.2                      |
| <b>4-5</b>   | L.5.4                     | 5.E.1.2<br><b>5.E.1.3</b>   | 5.L.1.2   | NC.4.MD.1                       |
| <b>6-7</b>   | W.6.2                     | 6.C.1.3<br><b>6.B.1.2</b>   | 7.L.1.4   | NC.7.SP.3<br>NC.7.SP.4          |
| <b>8-9</b>   | RI.9-10.8                 | 8.E.1.3<br><b>EPF.MCM.1.1</b>   | 8.P.1     | NC.M1.A-REI.6<br>NC.M1.A-REI.12 |
| <b>10-12</b> | W.9-10.3<br>W.11-12.3     | FPC&G.3.4   | Phy.2.3.3 | NC.M1.S-ID.1                    |