

# 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

## Balance



### ENGLISH LANGUAGE ARTS

Many times in your school career you are going to be asked to conduct research on a topic and then present the results in either a paper, speech, presentation or another format. In informational/explanatory writing it is important to do so in a fair and balanced way. This is different than in an argumentative piece of writing where you are asserting a particular claim.

Think about a topic that you have seen discussed in the press where two or more viewpoints oppose each other, and then research it. Try to find as many unbiased sources as you can. If you decide to include biased sources in your research, make sure that you review sources from both sides. Create a blog or podcast where you practice presenting the information with an objective tone. Make sure that you develop the topics with well-chosen, relevant, and sufficient details.



### SOCIAL STUDIES

People travel by car, plane, boat, and train to destinations across our state, nation, and the world. It was not always this simple, though. Read about the history of transportation in North Carolina. How have transportation changes brought a balance of opportunities across the state? The article was written in 2006, so as you read it, think about any changes since that time.

<https://www.ncpedia.org/transportation/history>

Starting with the information from this article as well as other sources (e.g., NCDOT, Amtrak, etc.) create a print or digital resource map (using the link below) of our state showing major transportation pathways (e.g., interstates, ferries, light rail, etc.). How do these resources allow us to move people, goods, and ideas?

<http://mapmaker.nationalgeographic.org/#/>



### SCIENCE

You may have heard someone say that you should have a balanced diet, but what exactly does this mean? The United States Department of Agriculture (USDA) has an entire website and app dedicated to helping us to build healthy eating habits one choice at a time. The website even has recipes:

<https://www.choosemyplate.gov/>

The Centers for Disease Control (CDC) also has guidelines as to how we can eat a healthy and well-balanced diet: [https://www.cdc.gov/healthyweight/healthy\\_eating/index.html](https://www.cdc.gov/healthyweight/healthy_eating/index.html)

Given what you have learned through recipes and guidelines on how to eat a well-balanced diet, compare diets from various regions around the world. How does the quality of health change within these regions? What might cause these differences in overall health?



### MINDFULNESS

Coming across a set of stacked stones, or cairns, in nature reminds us of those who walked the path before us. Visually the stones remind us of the balance needed for a content life. As the linked video illustrates, looking at stacked stones can be quite zen-like: <https://youtu.be/bETs6Fbr5dY> Stacking stones requires your full attention on the task and in the present to find each stone's center of gravity and its connection to the other stones.

Create your own cairn by using stones found in your yard or other objects around your house. Be sure to take a picture since it may not last long. Some people place a wish on each stone and believe the wish comes true when the stack falls.

Before creating a cairn in a public park, read this U.S. National Parks Services's article. <https://www.nps.gov/articles/rockcairns.htm>



## LOGIC PUZZLE

You have 12 balls and you know that they all weigh the same, except for 1 which is heavier or lighter than all the others. However, you don't know which ball it is. How can you make sure you know which ball is the heaviest/lightest in only 3 weighings?



## FIELD STUDIES

In the modern world, almost everyone is a photographer. The cameras that are embedded in smartphones now take higher quality photos than professional cameras did a decade ago. Have you ever noticed that some people just seem to take really amazing shots?

Read about five kinds of balance in photography to help you improve your photography skills: <https://www.nyfa.edu/student-resources/five-kinds-photography-balance-you-need-to-understand/>

After reading the article, use a phone or a camera to take several photos utilizing each photo to show off your understanding of at least one of the principles in the article. Compare these photos to ones you have taken previously. Can you see a difference?



## RESEARCH EXPLORATIONS

The Broomstick Challenge has made a few rounds on social media. According to a lot of Instagram posts, the ability to stand a broom up on its own happens on certain days due to the gravitational pull. Try to balance a broom vertically. Turns out the ability to balance the broom has less to do with the alignment of planets than the center of gravity of the broom. Watch the video for a great explanation: [https://youtu.be/QfATP\\_arvCg](https://youtu.be/QfATP_arvCg)

Another balancing trick uses a 3-foot wooden dowel and playdoh. Use a meter stick or yard stick if you do not have a dowel. Place a lump of modeling clay about the size of your fist eight inches from the end of the dowel. Try balancing the dowel on the end closest to the clay. Flip the dowel and try to balance it on the other end. Why does it balance easier on one end? View this video to learn more about how rotational inertia influences balance: [https://youtu.be/lk\\_Pwu7nf1U](https://youtu.be/lk_Pwu7nf1U)



## MATH

The balance, or final amount, in a bank account depends on how much money is placed in the account (principal), the interest rate, how many times per year the interest is compounded and how long the money stays in the account. For more information about compound interest, watch the Khan Academy video: <https://bit.ly/2VVH8G7>

You started saving for a car six years ago by putting \$5,000 in the bank. Your bank pays an interest rate of 1.25% compounded monthly. What is the balance in the account? What if instead of putting \$5,000 in the bank you saved it in a safe place at home and added \$200 to it each year? Use a graphing calculator to graph both scenarios. How are the graphs similar? How are they different?

Why do banks call it a balance?



North Carolina Department of  
**PUBLIC INSTRUCTION**



## Balance Reference Guide

### **2-3 Logic Puzzle:**

Solution:

blue = 12; orange = 12

blue ball = 12; blue star = 4

blue = 12; orange = 6

blue = 12; green = 6

[https://drive.google.com/file/d/0B624p\\_IrRSi0QzU3bGpBOWw5S0U/view](https://drive.google.com/file/d/0B624p_IrRSi0QzU3bGpBOWw5S0U/view)

### **4-5 Logic Puzzle:**

Solution: The "balance" and "spend" columns do not have to match, and in most cases, will not match. They are not always equivalent because you cannot compare them in that way. The amount in the "balance" is what is left over and depending on how much you "spend," equals what is left (the "balance") and therefore, if you only spend \$1 at a time, you will always have large numbers left over. Whereas, if you spend all of it at one time, you will have \$0 in the "balance."

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

Solution: If the coin picked by the warden is real then the scale would display 0 or an even number. If the coin is fake then the scale will display an odd number.

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

Solution: If the coin picked by the warden is real then the scale would display 0 or an even number. If the coin is fake then the scale will display an odd number.

### **10-12:**

**Logic Puzzle Solution:** <http://www.bridges.com/2011/10/hardest-balance-logic-puzzle.html>.

**Math Solution:** \$156.83

Work on more problems with IXL: <https://www.ixl.com/math/algebra-2/continuously-compounded-interest-word-problems>

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**K-12**

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### NC Standards Alignment

Grade Span	English/ Language Arts	Social Studies	Science	Math
<b>K-1</b>	W.1.1	1.E.1.3 1.E.1.2 1.E.1.3	K.P.2.1 science K.MD.2 -math	NC.1.OA.4 NC.1.OA.7 NC.1.OA.2
<b>2-3</b>	RI.3.2	3.E.1.2 3.E.1.4	3.L.2.2	Mathematical Practice Standard 2
<b>4-5</b>	RI.5.8	5.E.2.2 5.E.2.1 5.E.2.2	4.L.1.1	Mathematical Practice Standard 2
<b>6-7</b>	W.6.1	7.H.2.1 7.H.1	7.P.1.2	NC.6.EE.7 NC.7.EE.4
<b>8-9</b>	W.9-10.2	8.G.1.1 8.G.1.3	8.L.5.2	NC.M1.A-CED.1 NC.M1.A-CED.2
<b>10-12</b>	W.9-10.2	AH2.H.4	PSc 2.2.4	AFM 2.01