

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

Structure



ENGLISH LANGUAGE ARTS

In poetry, messages or meaning are communicated through the structure and the literary devices used in the poem. William Shakespeare's "Sonnet 18" begins with a comparison that leads to a conclusion, however, many sonnets are structured as problem/solution or question/answer.

Using the link, read Shakespeare's "Sonnet 18:"
<https://www.poetryfoundation.org/poems/45087/sonnet-18-shall-i-compare-thee-to-a-summer-day>

- How does the structure communicate the poem's overall message?
- How is the structure - 3 quatrains and a rhyming couplet - important to theme development?

Write your own sonnet with a problem/solution structure, ensuring your points are clear, convincing, and engaging.



SOCIAL STUDIES

When the Founding Fathers wrote and ratified the Constitution, they wanted to make sure that the government did not abuse its power. The Founders separated powers among three branches of government: the legislative (law-making), the executive (law-enforcing), and the judicial (law-interpreting) branches.

Take a tour of the Constitution Center website to see how the Founding Fathers divided our branches: <https://constitutioncenter.org/learn/hall-pass/separation-of-powers>

- What are the powers that each branch has?
- How can they check each other's powers?

Create a graphic organizer that illustrates how the three branches keep the balance of power in check.



SCIENCE

Did you realize a concrete driveway can shift and move based on temperature? More impressively, so does a bridge! Many structures we consider static have a dynamic nature.

What is the impact of thermal expansion on a stationary structure? Why is it important that civil engineers build structures to accommodate this sort of expansion? Watch the video to see how civil engineers have tackled this issue: <https://www.youtube.com/watch?v=pH7VfJDq7f4>

Create a visual to explain thermal expansion. Consider a comic strip, a diagram, or even a video for others to view.



MINDFULNESS

It is important to stay healthy mentally and physically. A structured day can help ease many of the stressors we all experience. Evaluate the way you structure your day, by researching reading the Tips for Success found in the article "Creating Healthy Routines" from the Mental Health America website: <https://mhanational.org/sites/default/files/Handout%20-%20Creating%20Healthy%20Routines.pdf>

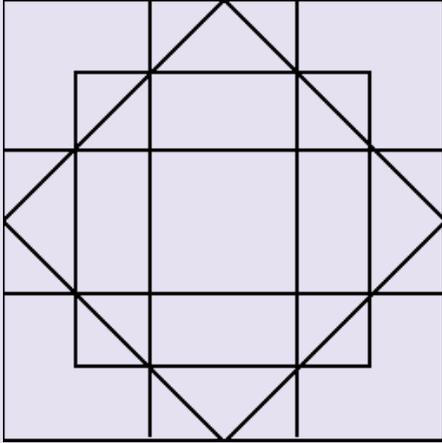
Create a healthy routine to implement each day for two weeks. Then ask yourself these questions:

- Were you able to stick with your healthy routine? How did you feel?
- If not, what got in the way of you accomplishing your goals or tasks?
- What are things you can do to address the barriers?



LOGIC PUZZLE

The diagram below shows a pattern made up of squares. How many squares can be found in the pattern?



FIELD STUDIES

The broad field of engineering encompasses an array of rewarding opportunities. Most engineers focus on a specialization, such as civil, aerospace or mechanical engineering. No matter the specialization, engineers are in demand in a variety of fields.

Are you interested in engineering? Take this quiz to determine what type of engineering might fit your personality: <https://spacefem.com/quizzes/engineer/>

What branch of engineering did the quiz indicate would suit your personality? Do you agree with this?

Research this field to determine what jobs you would be doing if you pursued this type of engineering.

Find colleges that offer a degree in this field of engineering. Use this site to help search: <https://bigfuture.collegeboard.org>



RESEARCH EXPLORATIONS

The Chunnel is a railway that lies underneath the choppy waters of the English Channel. It connects the island of Great Britain with mainland France. Completed in 1994, it is considered one of the world's most amazing engineering structures of the 20th century. Watch the link to see how this was accomplished:

<https://www.youtube.com/watch?v=qNS2jj2w-GI>

- Consider some of the benefits of Great Britain being connected to mainland Europe.
- What are some potential negative impacts?
- Where are some other locations that a similar structure would be beneficial?

One of the most difficult tasks on this project was making sure that each side met in the middle. Create a skit describing how a conversation between Great Britain and France would have occurred, answering the questions above, and ensuring the tunnel would join in the center.



MATH

Describe each of the following as a simple geometric shape or combination of shapes. Illustrate with a sketch and label dimensions important to describing the shape.

1. Pear
2. Thumb Tack
3. Water bottle label
4. A shoe box

As an extension, find at least four shapes in the real world to sketch and label.



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PUBLIC INSTRUCTION



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Structure Reference Guide

K-1 Logic Puzzle:

Solution: Kayla 56, Matt 43, Maria 12, Theo 90

2-3 Logic Puzzle:

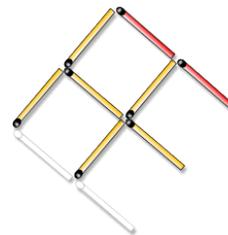
Watch the video for a solution: <https://mindyourdecisions.com/blog/2018/08/27/can-you-solve-these-matchstick-puzzles/>

4-5 Logic Puzzle:

Turn the fish with 3 matches:

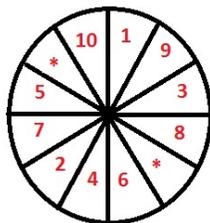


Turn the fish with 2 matches:



6-7 Logic Puzzle:

Solution:



WHEEL OF MATH

8-9 Science:

Infographic Resource link: <https://piktochart.com/blog/how-to-create-an-infographic-and-other-visual-projects-in-5-minutes/>

8-9 Logic Puzzle:

Solution: 4

10-12 Logic Puzzle:

Solution: 24

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Structure NC Standards Alignment

Grade Span	English/ Language Arts	Social Studies	Science	Math
K-1	RL.1.3	K.C&G.1.2 1.C&G.1.2 K.C&G.1.1 1.C&G.1.4	1.E.2.2	NC.1.NBT.3 NC.1.NBT.4
2-3	RL.3.5	3.E.1.2 3.E.1.2	3.L.2.2	NC.3.OA.8
4-5	L.5.5	5.G.1.1 5.G.1.1 5.G.1.4	5.P.3.2	NC.4.OA.1
6-7	RL.7.5	6.C&G.3 6.C&G.1.1	6.P.2	NC.6.EE.2 NC.6.EE.3 NC.6.EE.4 NC.7.EE.2 NC.7.EE.3
8-9	RL.9-10.5	F.P.C&G.2.1 CL.C&G.4.1	8.E.1.4	NC.M1.A-CED.2
10-12	RI.11-12.5	F.P.C&G.1	P.Sc.3.1	NC.M3.G-MG.1