

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

Time



ENGLISH LANGUAGE ARTS

Time travel is a plotline of many stories: Twain's *A Connecticut Yankee in King Arthur's Court*, Wells' *The Time Machine*, and Dickens' *A Christmas Carol* all involve time travel. Washington Irving's short story "Rip Van Winkle" (1819) also relates to time. In the 1820s people began calling North Carolina "The Rip Van Winkle State." Read this short story and explore how Irving manipulates time to move his plot forward:

<https://www.gutenberg.org/files/60976/60976-h/60976-h.htm>

- How would the story be different without the time shift?
- Determine the theme of the text.
- How does the use of time impact the theme?

Think about why North Carolina would have been given this nickname. Create a movie trailer for this story. Be sure to include the role time plays in the story, but don't give away the ending.



SOCIAL STUDIES

Life insurance protects loved ones from financial hardship after the insured person's death. There are many types of life insurance policies, and it can be confusing. As you study these differences, you will notice that time plays an important role in them. Policies can change over time and some are only applicable for a certain time period. Check out the differences in Term and Whole/Permanent Life Insurance. Use the link to find out about the kinds of Term and Whole/Permanent life insurance policies: <https://www.iii.org/article/what-are-principal-types-life-insurance>

Would one kind of policy be better to purchase in your twenties, while another kind would be better to purchase in your sixties?

Make a chart of the different varieties, showing important information about each.



SCIENCE

Weathering is a process that happens over time. There are three types of weathering:

- physical (also called mechanical)
- chemical
- biological

In this lab, you are going to take a look at mechanical and chemical weathering to see how these natural actions impact our earth over time. The only item you will need to conduct the lab is a cracker and your science notebook. Complete the lab including the Analysis and Conclusion Questions. <https://www.soils4teachers.org/files/s4t/lessons/weathering.pdf>

Now design your own lab that you could use to teach younger students about the impact of weathering over time.



MINDFULNESS

Teens need 8 to 10 hours of sleep each night. At the same time, their biological sleep patterns mean it is natural to stay up later. It is not surprising that most teens are sleep-deprived with only 15% reporting sleeping 8 ½ hour or more on school nights.

Read the article about sleep for teens:

<https://www.sleepfoundation.org/articles/teens-and-sleep>

So what is the solution? Create a plan to help teens get the sleep they need. Use PowerPoint or Google Slides to present your plan to your fellow students or others as appropriate. Create a presentation for school administrators encouraging them to adjust school schedules to better meet the sleep requirements of teens. Ask your administrator for time to present your plan.



LOGIC PUZZLE

Consider the following clues to answer the question below:

- The clock was correct at midnight.
- From that moment it began to lose four minutes per hour.
- The clock stopped three hours ago showing 12:08 pm.
- The clock runs for less than 24 hours.

What is the correct time now? Explain your answer.



FIELD STUDIES

Albert Einstein is often associated with the Theory of Special Relativity that explains how space and time are linked for objects that are moving in a straight line at a consistent speed. Watch this video for a brief overview: <https://youtu.be/ajhFNcUTJl0>

After this brief introduction, it is time to dig in deeper for more details about Einstein's Theory. Take the Elementary Tour of Relativity on this website: <https://bit.ly/3foOAS8>

After exploring the idea of Special Relativity, create a way to share this information with others. You can design a presentation, do it artistically, write a summary, or use another format of your choice. Make sure to include how time relates to the theory.



RESEARCH EXPLORATIONS

Most people think of a day as the time it takes the Earth to rotate but that is not exactly 24 hours. Research how geologists have been able to determine the number of hours in a day during different time periods using the link: <https://www.scientificamerican.com/article/earth-rotation-summer-solstice/>

Has time sped up or slowed down? Use this chart to determine the length of a day during each geological time period: <https://docs.google.com/document/d/1ySqdzlDYCnujiwOHNI7ntxQyjoBcOvkFWS4V61lw/edit?usp=sharing>

Use the Desmos graphing calculator to graph the data comparing the age (years) to the hours per day. How much has the length of a day increased in seconds per century? Write a tweet (140 characters or less) explaining this change in time.



MATH

Futurama is a cartoon series that follows a time-traveling pizza delivery guy named Fry. Fry's problems seem to follow him into the 31st century. When he needs money, he realizes that his bank is still in business and his account is still open.

With a balance of \$0.93, his account does not seem to be very lucrative. The interest rate is 2.25% and was compounded annually over 1,000 years.

- How much money is in Fry's account?
- How much longer would it take Fry to double his money?
- How long would it take Fry to earn \$1,000,000 in interest?

Watch a scene from *Futurama*: <https://www.youtube.com/watch?v=g9Z4d5EOjGs>



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K-12

Time Reference Guide

K-1 Logic Puzzle:

Solutions:

Challenge 1

12:00, 1:05, 2:10, 3:15, 4:20, 5:25, 6: 30, 7:35, 8:40, 9:45, 10:50, 11:55

Challenge 2:

1:01, 1:11, 1:21, 1:31, 1:41, 1:51,

2:02, 2:12, 2:22, 2:32, 2:42, 2:52

3:03, 3:13, 3:23, 3:33, 3:43, 3:43

4:04, 4:14, 4:24, 4:34, 4:44, 4:54

5:05, 5:15, 5:25, 5:35, 5:45, 5:55

6:06, 6:16, 6:26, 6:36, 6:46, 6:56

7:07, 7:17, 7:27, 7:37, 7:47, 7:57

8:08, 8:18, 8:28, 8:38, 8:48, 8:58

9:09, 9:19, 9:29, 9:39, 9:49, 9:59

10:01, 11:11, 12:21

2-3 Logic Puzzle:

Solution: <https://www.aimsedu.org/2013/04/08/timemarches-on/?highlight=time>

4-5 Logic Puzzle:

Solution is included in the video: <https://www.youtube.com/watch?v=KM5KUIyAJ9I>

6-7 Logic Puzzle:

Solution: 4:22

8-9 Logic Puzzle:

Solution: 4:00

10-12 Logic Puzzle:

Solution: Larry goes to bed at 9:00 pm.

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Time NC Standards Alignment

Grade Span	English/ Language Arts	Social Studies	Science	Math
K-1	W.1.1	1.H.1.1 1.H.1 1H.1.2	K.E.1.1 K.3.1.3	NC.1.MD.4
2-3	RL and RI.3.10	3.H.2.1 3.I.1.10 3.H.1.3	2.E.1.3 2.E.1.4	NC.3.MD.3
4-5	RL and RI.5.10	EX.5.G.1.2 5.I.1.4 5.G.1.4	5.E.1.1	NC.5.MD.2
6-7	W.6.3	7.G.1.2 7.G.1.3	7.P.1.3	NC.7.RP.1 NC.7.RP.3
8-9	RL.8.2	FPPFL.2.4 EPFMCM.3.4	EEn.2.1.3	NC.M1.A-CED.1
10-12	W.9-10.3	AH2.H.3	EEn.2.5	NC.M1.S-ID.1