

Please remember that all assignments are due May 1st

Life Science week of April 27–May 1

The reading assignment this week in the Sand County Almanac is 'Bur Oak,' p 26–30. When we began reading passages in Sand County, it became clear that Leopold always established a theme very quickly in his writing. In the passage you will read, 'War' is the theme and it is between the prairie and bur oak trees. Notice the language Leopold uses to reinforce the theme of war. Some of the words include: shock troops, armor, battle, allies, front, old soldiers, and veterans. I have said in class more than once how structured thoughts lead to structured writing, which we clearly see in Leopold's writing. Therefore, it is important to know what you are going to say before writing.

The Bur oak passage contains some words that you likely are not familiar with at this stage in life. **Please look up definitions and write them in your notebooks for these words:** embedded, mosaic, haycocks, immemorial, and discerning.

The paragraph you are going to write after reading 'Bur oak' definitely needs a topic sentence and you should already know something that will be in it. I hope you were thinking 'war' and 'bur oak.' As you will discover while reading, the prairie and bur oak are the main combatants in this war, which botanists can trace back 20,000 years. Other parties that change loyalty with the seasons are mice, rabbits, squirrels, and beetles (you should include some in these and how their activities both hurt and help the bur oak). People that settled the prairie in the 1840's changed the balance in favor of the bur oak.

Based on the preceding sentences in the above paragraph the topic sentence you are going to use has virtually written itself. **Topic sentence:** "The 20,000 year

war between bur oaks and the prairie has been fought with different weapons and natural allies, but man changed the balance of power. We know that a topic sentence tells the reader what is to follow, but in a general way. What are the generalities you can elaborate on in your paragraph? Fire is the main weapon that destroys trees. The ‘natural allies’ are things such as beetles, mice, rabbits, and squirrels. Man changed the balance of power by plowing the prairie grasses to farm. Did this action of man increase or decrease prairie fires? Now that you have everything necessary to write and an ordered thought process, **please write an ordered/structured paragraph.**

The next part of our assignment for the week shifts to data regarding the growth of tomato and watermelon plants, which we grew indoors from seeds. This was a long-running experiment and we are now going to calculate growth rates for tomato versus watermelon plants. Although the majority of you have dutifully recorded data, I know all have not. Therefore, I will list the data so everyone can complete this exercise. **All measurements are in centimeters (cm)**; T1 = tomato 1; T2 = tomato 2; W1 = watermelon 1; and W2 = watermelon 2. There are no measurements for T2, W1, and W2 in some of the early dates because seeds sprouted at different times and the container for W2 was upset and we had to replant seeds.

Date	T1	T2	W1	W2
2/28	2 cm			
3/2	2.4 cm			
3/4	4 cm	2.5 cm	0.4 cm	
3/6	5.1 cm	4.3 cm	0.8 cm	0.8 cm
3/11	5.1 cm	5 cm	2.9 cm	5.2 cm
3/13	5.2 cm	5 cm	4 cm	9.2 cm
3/16	5.2 cm	5.2 cm	4.7 cm	9.4 cm
3/19	6.1 cm	6 cm	5.1 cm	9.8 cm
3/27	6.5 cm	6.4 cm	5.1 cm	10.5 cm
3/31	6.6 cm	7 cm	5.1 cm	10.5 cm
4/3	7.9 cm	8.7 cm	5.3 cm	10.5 cm

A scientist always examines data carefully to identify similarities and differences. What major difference do you see for the watermelon plants? Is the rate of growth constant, meaning did all the seeds grow at the same rate from late February to early April? Are the heights of the tomato plants the same as the watermelon plants? These are things that need to be quantified, meaning we have to perform some calculations and make graphs.

Our first calculation involves growth rates. The units will be in cm/day, meaning we need to determine the height of a plant over a specific period of time. We will do T1 together and you can use this as an example for calculations involving T2, W1, and W2. Notice that the first recorded height for T1 is not zero. Therefore, we will need to subtract 2 cm (the initial height) from 7.9 cm (the final height) to get 5.9 cm (this is the actual amount that the plant grew). Next, we need to determine the number of days. There are data for 2 days in February, 31 in March, and 3 for April. The total is 36 days (2 + 31 + 3) and we will divide this into 5.9 cm (5.9 cm/36 days) to get 0.16 cm/day. This is our growth rate for T1 over the period from 2/28 to 4/3. **Please calculate growth rates for T2, W1, and W2. Make sure you do not lose these numbers because we will need them to write a conclusion. Also, photograph and email these to me in order to get credit for your work.**

A scientist also displays data in different ways to highlight trends. It is not easy to see trends by looking at numbers in a table, **so we will present the data for T1 and W1 in X-Y graphs. The X axis will be labeled 'Number of Days' and the Y-axis will be labeled 'Plant Height (cm).'** If you have graph paper use it but if not, **find a ruler and mark equal divisions on your paper to make a grid. You may not have enough room for 36 divisions (1 division = 1 day) on your paper, so change the scale and have 1 division = 2 days.** Your first data point will plot on the Y-axis at 2 cm, because we made our first measurement on 2/28 (no days had passed so X = zero). Your next data point will have the coordinates X = 3 (2/29 to 3/2 represents a total of three days) and Y = 2.4 cm (this number is for T1, date of 3/2

in the table above). The coordinates for your next data point are $X = 5$ (2/29 to 3/4 represents a total of 5 days) and $Y = 4$ cm (this number is for T1, date of 3/4 in the table above); continue in this way until finished and then connect the points you plotted in the graph with a line. Now study your graph for a moment; note how the line is initially steep and then flattens out between 5.1 cm to 5.2 cm. After this the line steepens to reach 7.9 cm. We will call the flat area between 5.1 cm to 5.2 cm a 'plateau.'

Please plot the data for W1 in the above table to make another X-Y graph. Does this graph look the same or different compared with the graph for T1? Initially, the line connecting the points you plotted for W1 has a sharp rise, but then the line levels out (reaches a plateau) and doesn't rise again. When we look at numerical data (the actual numbers) for W2 in the above table, there is a large increase in plant height from 3/6 to 3/19. However, there is no increase in plant height from 3/27 to 4/3 (we reached a plateau). Since this is the case for both W1 and W2, it is clear that watermelon and tomato plants grow differently. **Please write these things down in your notebooks and do not lose the graphs you labored to construct. Also, please email me a picture of your graphs to receive credit for your effort.** Next week, we will use these things to write a conclusion for the lab.

American History week of April 27 – May 1

We will get to the start of the American Revolution (represented by the Battles of Lexington and Concord) this week, following a quick review of important points. After the colonists burned a British schooner that had run aground while patrolling for smugglers off Providence in 1772, King George III formed a special commission to identify the guilty colonists and have them sent to England to stand trial. Colonists were alarmed by the prospect of being tried in England, but there was peace until Parliament passed the Tea Act in 1773. This act was meant

to save the East India Company from bankruptcy, since the colonists had staged a very-successful boycott of British tea. The colonists responded by disguising themselves as Indians and staging a violent protest: the Boston Tea Party. An angry King George III had Parliament pass the Intolerable Acts, whereupon the colonists staged a second round of tea parties and then assembled the first Continental Congress in 1774.

(New material) One of the results of the Continental Congress meeting was that New England towns began stockpiling weapons and gun powder. British General Gage (the appointed governor of Massachusetts) learned of this but didn't immediately act, because it was a long winter and cold spring. Food was scarce and British troops suffered from low morale, however, there were rumors of a large stockpile of weapons and munitions stored outside of Boston. This prompted General Gage to send out British agents toward the town of Concord in March 1775. These spies returned with maps of where arms were being hidden and news that both John Hancock and Samuel Adams (leaders of the Sons of Liberty) were staying in Lexington (5 miles east of Concord). However, the Sons of Liberty had spies that reported British activities to Joseph Warren, a prominent doctor in Boston. Dr. Warren also received news from a confidential informant, possibly General Gage's American wife, about Gage's plans to march to Concord.

Dr. Warren immediately sent for Paul Revere (another member of the Sons of Liberty) to warn Hancock and Adams. Paul Revere assembled a network of riders that included William Dawes and Samuel Prescott. On the night of April 18, 1775 Revere and his associates rode out to spread the word that 700 Redcoats were marching to Concord. British troops didn't reach the town of Lexington until April 19th and were confronted by 70 Minutemen (men in the colonial militia) that withdrew, but refused to give up their weapons. A shot rang out and after 15 minutes of fighting, the victorious Redcoats marched to Concord in order to seize stockpiled weapons and capture Adams & Hancock. There was only a brief battle since both the weapons and men were gone, but Adams and Hancock are

rumored to have heard gunfire as they fled. When the Redcoats marched back to Boston, 3000–4000 Minutemen were concealed along the road and killed many British soldiers. The fighting at Lexington and Concord marked the start of the American Revolution, which Adams called ‘a glorious day for America.’

The second Continental Congress met in May 1775 and representatives debated how to resist the acts of Parliament and British forces. Representatives of Massachusetts (including John Adams) wanted the Continental Congress to declare each colonial government independent of England. At the other extreme were colonists still loyal to the crown that were against an American Revolution and wanted to reconcile with England. In the middle were men like Quaker John Dickinson, a representative of Pennsylvania, who advocated for peaceful resistance like that used to overturn the Stamp Act. Dickinson became well known throughout the colonies and Europe for his writings, which include ‘Letters from a Farmer in Pennsylvania.’

The Continental Congress continued their debates into June, when important events occurred. A large force of Minutemen that surrounded Boston to engage the Redcoats if necessary, were recognized as the Continental Army and placed under the command of 43-year old George Washington. The Continental Congress also authorized printing money to pay troops and organized a committee to deal with foreign nations. The second important event occurred at Breed’s Hill, north of Boston (we will end here). **Please record this information in your notebooks.**

There are two things I want you to look up on the internet. First, please type in ‘letters from a farmer.’ In the search results click on ‘Letters From a Farmer in Pennsylvania – Division of Historical... (website: history.delaware.gov). There are two small sections to read and at the bottom are audio recordings of each letter. **Please select one and listen to it; then write a paragraph about John Dickinson,**

'the penman of the revolution.' The second thing is to type in 'the midnight ride of Paul Revere.' In the search results select 'The Midnight Ride – Paul Revere' (website: www.paulreverehouse.org). **Please read the first section (The Real Story of Paul Revere) and do a written narration.** You can skip the next section about his horse (if you like), but read the final part (Did Revere finish his midnight ride?) and study the map.

We will now move onto Chapter 2 of 'A Delicious Country.' **Please read p 30–46 and do a written narration.** I would suggest focusing your writing on the Guerry family, as they are descendants of the original French Huguenot colonists. **Please update your map to show Scott Huler's progress through South Carolina (he finishes at the Cantey family cemetery, near Lake Moultrie dam).**

English History week of April 27 – May 1

We are returning to 'A History of England' and the reign of King Edward I (remember that he defeated Simon de Montfort, who established the first Parliament in England). We know how Edward I was a wise king and brave soldier who finally defeated the Welsh. After Wales became part of England, the people saw Edward as a true English king and the barons were ready to serve him. However, problems soon arose in Scotland after the death of King Alexander III. His granddaughter, Margaret of Norway, was the rightful heir to the throne but only a child. Sadly, she died during the voyage from Norway and 13 people claimed the Scottish throne.

John Balliol and Robert Bruce (barons that held land in both Scotland and England) emerged as the top contenders to be the next Scottish king, but neither was able to claim the throne. Therefore, the Scottish people allowed King Edward to determine which man should be their king, and he selected John Balliol. King

Edward I then commanded King Balliol to do homage (remember the Feudal system). King Balliol was prepared to do homage, but the Scottish people refused and this caused King Edward I to lead an army north. A baron in this army was Robert Bruce, who was accompanied by his grandson 'Robert the Bruce.' King Edward first conquered the city of Berwick; then achieved victories at the Great Battle of Falkirk (1298) and Scone. He returned to England with possession of the 'Stone of Destiny,' upon which Scottish kings were crowned.

After suffering defeats and being humiliated by King Edward I, the Scottish people united behind William Wallace (think of the movie 'Braveheart'). He defeated English troops many times and put courage into the hearts of his countrymen to fight foreign invaders. After his capture and execution in 1305, the old & feeble King Edward I led an army north to conquer Scotland. However, King Edward I died within sight of the border. **Please record this information in your notebooks.**

I have selected two passages from the book for you to read and do written narrations. These include Edward II and Bannockburn. I would also like you to read 'The Beginning of the Great War,' to better understand what led to the 100 years' war between England and France.

The geography aspect of our lesson involves a few castles and two regions of Scotland. **You will need to sketch and label one thing in Scotland that catches your interest.** Please use the internet to look up Stirling Castle and Berkeley Castle. Wikipedia gives a thorough review of Stirling castle's history and many images of the interior and exterior. Stirling Castle should sound familiar to members of last year's English History class, due to the connection with Mary Queen of Scots. Wikipedia also gives a good history of Berkeley Castle, where King Edward II was murdered.

We also want to visit the Scottish Highlands and Lowlands. Please type in 'Scottish Highlands' and in the search results select Wikipedia. There are images on the right side, beginning with a location map showing the Highlands vs. Lowlands. Please scroll down until you see images labeled Loch Long and Inverness. Click on the image of Inverness (the traditional capital of Scotland). The castle you see on the right is Inverness Castle, the original castle on this site was built in 1057. Our next image is of Ben Nevis, the highest point in the Highlands at 4413 feet. Proceed to the next image and click on the blue colored subheading 'Isle of Skye.' Look on the map to determine its location and note how the Isle of Skye is the northernmost and largest of the Inner Hebrides (remember how the Brendan sailed through the Hebrides Islands and then set off for the Faro Islands). Scroll down through the images and note Portree (the largest settlement), Dunvegan Castle (home to clan MacLeod since the 13th century), Skye terriers, and the black guillemot.

I have selected a few places in the 'Scottish Lowlands' for you to visit via the internet. First type 'Dumfries Scotland' and click on 'images' to take a tour of the coastal town. Next type 'Eyemouth Scotland' and click on 'images' to explore this fishing community. Finally, type 'Ayrshire Coastal Path' and click on 'images.' In this area is the Glenfinnan viaduct, which serves as both a conduit for water and railroad bridge (type in 'Glenfinnan viaduct Scotland' to take a look, before calling it a day).

Biology week of April 27 – May 1

We want to begin the bread mold lab on Thursday. Therefore, I need to know who will be coming to school in order to make observations versus who will conduct the experiment at home. At this point, I know that Jackson will be

using gluten-free bread to provide a comparison to regular bread and Chris plans to dampen bread with orange juice (remember that citrus is acidic and we wanted to study the effects of both acids and bases on mold growth. Bases we could use include ammonia and hydrogen peroxide). Please let me know by Wednesday how each of you are going to participate in our lab finale.

There are a few things we want to read in Chapter 19, before moving beyond fungi. Please begin reading on p 237/Destructive Fungi. **Salient points to put in your notes: although fungi are important due to consuming vast amounts of dead organic material, they also feed on living plants and organisms (including people). Farmers are particularly concerned with fungi that cause diseases in plants.** Figure 19.4 shows 'Rust' on corn, a fungal disease you have likely heard about at some point.

Please read the section titled Athlete's Foot (p 238). **A very-important point that needs to be in your notes is how fungi feed/eat. The process is called extracellular (meaning outside the cell) digestion. Recall how the Golgi body produces lysosomes, which are vacuoles filled with digestive enzymes. In fungi, lysosomes move by exocytosis to the cell wall and diffuse through it. Organic material outside the fungi hyphae (remember how these appear as threads) is then broken down to fundamental units (e.g., amino acids, monosaccharides, and fatty acids). This provides all the materials for the fungi to live and grow.**

Not all fungi are bad and a very important one is yeast. Please continue with your reading on p 238/Beneficial Fungi, and stop near the top of p 240 'killed bacteria or inhibited their growth.' There are a few things that need to be in your notes. **Yeast is not a typical fungi because it lacks hyphae.** However, brewers and bakers could not make their products without yeast. Recall how cellular respiration (the burning of food) in us creates CO₂, O₂, and ATP. **Yeast only partially breaks down sugar to create ethanol (C₂H₅OH), CO₂, and ATP. Ethanol**

is necessary in fermentation to produce alcoholic beverages. Bread rises due to yeast producing CO₂, but baking causes the ethanol to evaporate. Cheeses (e.g., brie, blue cheese, gorgonzola...) get their flavors from fungi curdling the milk. Finally, penicillin was discovered accidentally by Alexander Fleming in 1928, when he noticed that old bacterial cultures had been contaminated by a fungus. There was a clear zone around the fungus colony, where no bacteria grew because the fungus manufactured a substance to kill the bacteria (this is shown on a lemon in Figure 19.7). We will finish Chapter 19 by looking at the illustrations of different fungi presented in the book. **Please sketch and label one of these in your notebooks.**

[The Honors class will do two readings and written narrations about Louis Pasteur in *Microbe Hunters*. Please begin at Section 4 on p 73 and read to the end of p 82. Pasteur was convinced that microbes didn't spontaneously appear, but rather had parents. Please explain how this was proven by the experiment suggested by Balard and the one conducted by Pasteur's enemies (Pouchet, Joly, and Musset). A critical point you need to account for is dust in air. **Please begin at Section 5 on p 83 and read to p 87.** Does it make sense that Pasteur was able to determine if a wine was bitter, oily, or rosy by studying the microbes in it? Also think about how the discovery of gently heating wine to kill the bad microbes (the process of pasteurization, which is still used today) benefitted both the wine makers and furthered Pasteur's ambitions.]

Nature notebooking, week of April 20–24

It seems that nature notebooking literally ground to a halt in the two weeks prior to Spring Break. Since you are now rested, please get outside and sketch something while enjoying nature. **All high-school students should either send me a picture or bring your notebook when turning in written assignments on Friday.**

Spanish, week of April 20-24

PLEASE STAY CURRENT WITH DUOLINGO. Also, Railey and Cheyenne are the only students to complete both the translation and conversation aspects of Lesson 10. THESE THINGS NEED TO GET DONE AND THE CLOCK IS TICKING.