**Christina School District Assignment Board**

**Student's First & Last Name _____ Student ID/Lunch # _____ School_____ Grade_____**

**Grade Level: 11th**

**Week of June 8th, 2020**

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| **ELA** | This week you will hone your understanding of blogs by reading a narrative and creating a blog in the voice and characterization of the character using the text, as the window into the character.<br>----------<br>Read the narrative **"Bartleby, the Scrivener "** As you read, annotate words, phrases that identify characterization of all characters. | Answer the Text-Dependent Questions 1-5. | Reread or skim the text.<br>Complete Character Maps | Complete Day 4 Character Blog | Respond/comment on one of the blogs of your character from the perspective of the character you did not choose. The response must be 100-150 words |
| **Math (IM3)** | *Reasoning with If-Then Statements*<br><br>Answer "Which One Doesn't Belong?" and justify your choice. (attached) Review Concept Summary: | Complete Conditional Statements Worksheet 2 #1-9. (attached) Refer to Concept Summary if needed. | Complete Conditional Statements Worksheet 3 #1-5. (attached) Refer to Concept Summary if needed. | Complete Conditional Statements Worksheet 4 #1-3. (attached) Refer to Concept Summary if needed. | Complete CC Standards Practice Week 10 Worksheet 2 #1-4. (attached) Refer to Concept Summary if needed. |

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| | | | | | |
|---|---|---|---|---|---|
| | Conditional Statements (attached) Complete Conditional Statements Worksheet 1 #1-3. (attached) | | | | |
| **Science** | **What Is the Carbon Cycle? (part 1):**<br>**Read article. Highlight, underline and/or annotate for understanding.** | **What Is the Carbon Cycle? (part 2):**<br>Reread article and/or notations as necessary. Write your best answers to the following:<br>a) What would happen if all of Earth's carbon were stored in rocks?<br>b) Why is there more carbon in the atmosphere during winter than in summer in the northern hemisphere?<br>c) Why are plants and phytoplankton such important parts of the fast carbon cycle?<br>d) Explain why the carbon cycle slows when Earth cools. | **What Is the Carbon Cycle? (part 3):**<br>Reread article and/or notations as necessary. Write your best answer to the following:<br>Modern civilization relies on carbon in many different ways. In what ways are our economies, homes, and our means of transport based on carbon? Which of these could we change to emit less carbon in the future? | **Zircon Sheds New Light on Earth's Formation (part 1):**<br>Read article. Highlight, underline and/or annotate for understanding. | **Zircon Sheds New Light on Earth's Formation (part 2):**<br>Reread article as necessary. Write a claim that answers the following:<br>How is evidence like these zircon crystals important in determining the history of the formation of the Earth's surface?<br>Support your claim with relevant data or evidence from the article. Then, justify why the data or evidence supports the claim. |
| **Social Studies** | Complete Activity 1 from the document titled, "Responsible for the Korean War?" | Complete Activity 2, Guiding Question 1 from the document titled, "Responsible for the Korean War?" | Complete Activity 2, Guiding Question 2 from the document titled, "Responsible for the Korean War?" | Complete Activity 2, Guiding Questions 3 & 4 from the document titled, "Responsible for the Korean War?" | Complete Activity 2, Sources from the document titled, "Responsible for the Korean War?" |

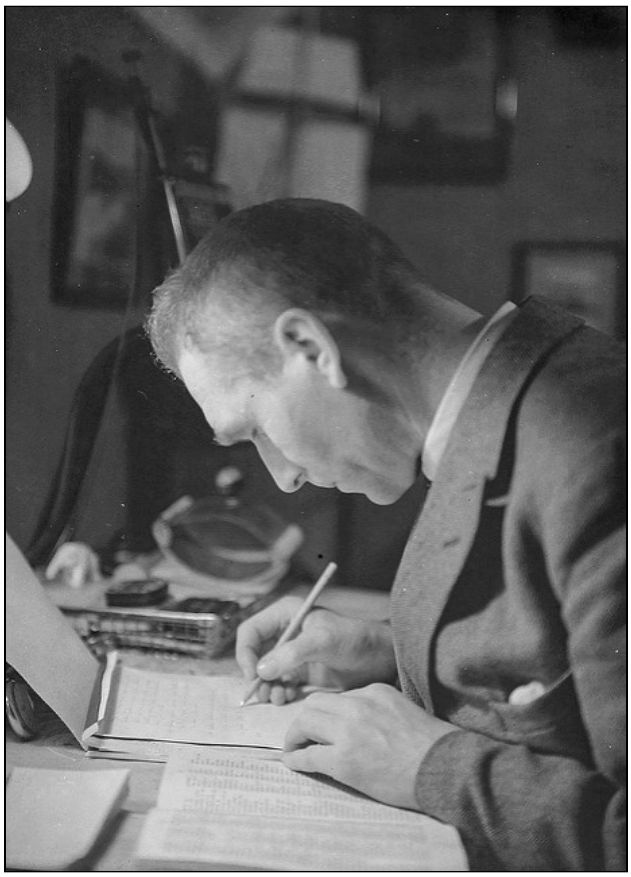
Name: _____ Class: _____

# Excerpt from "Bartleby, the Scrivener: A Story of Wall-Street"

By Herman Melville
1853

*Herman Melville (1819-1891) was an American novelist, short story writer, and poet. Melville's writing often explored aspects of philosophy and American society. In this excerpt from "Bartleby, the Scrivener: A Story of Wall-Street," a lawyer hires the scribe Bartleby. As you read, take notes on how the narrator describes Bartleby and responds to his actions.*

[1] In answer to my advertisement, a motionless young man one morning, stood upon my office threshold, the door being open, for it was summer. I can see that figure now — pallidly[1] neat, pitiably respectable, incurably forlorn![2] It was Bartleby.



"PEM-VRI-N00471 Vilhjelm Riksheim" by Perspektivet Museum is licensed under CC BY-NC-ND 2.0.

After a few words touching his qualifications, I engaged him, glad to have among my corps of copyists a man of so singularly sedate an aspect, which I thought might operate beneficially upon the flighty temper of Turkey, and the fiery one of Nippers.

I should have stated before that ground glass folding-doors divided my premises into two parts, one of which was occupied by my scriveners, the other by myself. According to my humor I threw open these doors, or closed them. I resolved to assign Bartleby a corner by the folding-doors, but on my side of them, so as to have this quiet man within easy call, in case any trifling thing was to be done. I placed his desk close up to a small side-window in that part of the room, a window which originally had afforded a lateral view of certain grimy back-yards and bricks, but which, owing to subsequent erections, commanded at present no view at all, though it gave some light. Within three feet of the panes was a wall, and the light came down from far above, between two lofty buildings, as from a very small opening in a dome. Still further to a satisfactory arrangement, I procured a high green folding screen, which might entirely isolate Bartleby from my sight, though not remove him from my voice. And thus, in a manner, privacy and society were conjoined.

1. dull
2. **Forlorn** ***(adjective):*** pitifully sad and lonely

At first Bartleby did an extraordinary quantity of writing. As if long famishing[3] for something to copy, he seemed to gorge himself on my documents. There was no pause for digestion. He ran a day and night line, copying by sun-light and by candle-light. I should have been quite delighted with his application, had he been cheerfully industrious. But he wrote on silently, palely, mechanically.

[5] It is, of course, an indispensable part of a scrivener's business to verify the accuracy of his copy, word by word. Where there are two or more scriveners in an office, they assist each other in this examination, one reading from the copy, the other holding the original. It is a very dull, wearisome, and lethargic[4] affair. I can readily imagine that to some sanguine[5] temperaments it would be altogether intolerable. For example, I cannot credit that the mettlesome poet Byron would have contentedly sat down with Bartleby to examine a law document of, say five hundred pages, closely written in a crimpy hand.

Now and then, in the haste of business, it had been my habit to assist in comparing some brief document myself, calling Turkey or Nippers for this purpose. One object I had in placing Bartleby so handy to me behind the screen, was to avail myself of his services on such trivial occasions. It was on the third day, I think, of his being with me, and before any necessity had arisen for having his own writing examined, that, being much hurried to complete a small affair I had in hand, I abruptly called to Bartleby. In my haste and natural expectancy of instant compliance, I sat with my head bent over the original on my desk, and my right hand sideways, and somewhat nervously extended with the copy, so that immediately upon emerging from his retreat, Bartleby might snatch it and proceed to business without the least delay.

In this very attitude did I sit when I called to him, rapidly stating what it was I wanted him to do — namely, to examine a small paper with me. Imagine my surprise, nay, my consternation,[6] when without moving from his privacy, Bartleby in a singularly mild, firm voice, replied, "I would prefer not to."

I sat awhile in perfect silence, rallying my stunned faculties. Immediately it occurred to me that my ears had deceived me, or Bartleby had entirely misunderstood my meaning. I repeated my request in the clearest tone I could assume. But in quite as clear a one came the previous reply, "I would prefer not to."

"Prefer not to," echoed I, rising in high excitement, and crossing the room with a stride. "What do you mean? Are you moon-struck? I want you to help me compare this sheet here — take it," and I thrust it towards him.

[10] "I would prefer not to," said he.

3. starving
4. **Lethargic** ***(adjective):*** sluggish
5. optimistic or positive
6. **Consternation** ***(noun):*** feeling of anxiety or dismay, typically at something unexpected

I looked at him steadfastly. His face was leanly composed; his gray eye dimly calm. Not a wrinkle of agitation rippled him. Had there been the least uneasiness, anger, impatience or impertinence[7] in his manner; in other words, had there been any thing ordinarily human about him, doubtless I should have violently dismissed him from the premises. But as it was, I should have as soon thought of turning my pale plaster-of-paris bust of Cicero out of doors. I stood gazing at him awhile, as he went on with his own writing, and then reseated myself at my desk. This is very strange, thought I. What had one best do? But my business hurried me. I concluded to forget the matter for the present, reserving it for my future leisure. So calling Nippers from the other room, the paper was speedily examined.

A few days after this, Bartleby concluded four lengthy documents, being quadruplicates of a week's testimony taken before me in my High Court of Chancery. It became necessary to examine them. It was an important suit, and great accuracy was imperative.[8] Having all things arranged I called Turkey, Nippers and Ginger Nut from the next room, meaning to place the four copies in the hands of my four clerks, while I should read from the original. Accordingly Turkey, Nippers and Ginger Nut had taken their seats in a row, each with his document in hand, when I called to Bartleby to join this interesting group.

"Bartleby! quick, I am waiting."

I heard a slow scrape of his chair legs on the uncarpeted floor, and soon he appeared standing at the entrance of his hermitage.

[15] "What is wanted?" said he mildly.

"The copies, the copies," said I hurriedly. "We are going to examine them. There" — and I held towards him the fourth quadruplicate.

"I would prefer not to," he said, and gently disappeared behind the screen.

For a few moments I was turned into a pillar of salt, standing at the head of my seated column of clerks. Recovering myself, I advanced towards the screen, and demanded the reason for such extraordinary conduct.

"Why do you refuse?"

[20] "I would prefer not to."

With any other man I should have flown outright into a dreadful passion, scorned all further words, and thrust him ignominiously[9] from my presence. But there was something about Bartleby that not only strangely disarmed me, but in a wonderful manner touched and disconcerted me. I began to reason with him.

"These are your own copies we are about to examine. It is labor saving to you, because one examination will answer for your four papers. It is common usage. Every copyist is bound to help examine his copy. Is it not so? Will you not speak? Answer!"

7. **Impertinence** ***(noun):*** lack of respect; rudeness
8. essential
9. characterized by disgrace or shame

"I prefer not to," he replied in a flute-like tone. It seemed to me that while I had been addressing him, he carefully revolved every statement that I made; fully comprehended the meaning; could not gainsay[10] the irresistible conclusion; but, at the same time, some paramount consideration prevailed with him to reply as he did.

"You are decided, then, not to comply with my request — a request made according to common usage and common sense?"

[25] He briefly gave me to understand that on that point my judgment was sound. Yes: his decision was irreversible.

It is not seldom the case that when a man is browbeaten[11] in some unprecedented and violently unreasonable way, he begins to stagger in his own plainest faith. He begins, as it were, vaguely to surmise that, wonderful as it may be, all the justice and all the reason is on the other side. Accordingly, if any disinterested persons are present, he turns to them for some reinforcement for his own faltering mind.

"Turkey," said I, "what do you think of this? Am I not right?"

"With submission, sir," said Turkey, with his blandest tone, "I think that you are."

"Nippers," said I, "what do you think of it?"

[30] "I think I should kick him out of the office."

(The reader of nice perceptions will here perceive that, it being morning, Turkey's answer is couched in polite and tranquil terms, but Nippers replies in ill-tempered ones. Or, to repeat a previous sentence, Nippers's ugly mood was on duty, and Turkey's off.)

"Ginger Nut," said I, willing to enlist the smallest suffrage in my behalf, "what do you think of it?"

"I think, sir, he's a little luny,"[12] replied Ginger Nut, with a grin.

"You hear what they say," said I, turning towards the screen, "come forth and do your duty."

[35] But he vouchsafed[13] no reply. I pondered a moment in sore perplexity. But once more business hurried me. I determined again to postpone the consideration of this dilemma to my future leisure. With a little trouble we made out to examine the papers without Bartleby, though at every page or two, Turkey deferentially[14] dropped his opinion that this proceeding was quite out of the common; while Nippers, twitching in his chair with a dyspeptic[15] nervousness, ground out between his set teeth occasional hissing maledictions[16] against the stubborn oaf behind the screen. And for his (Nippers's) part, this was the first and the last time he would do another man's business without pay. Meanwhile Bartleby sat in his hermitage, oblivious to every thing but his own peculiar business there.

10. to deny or contradict a fact or statement
11. to intimidate someone
12. short for "lunatic"
13. to give or grants someone something
14. marked by showing respect
15. irritable
16. a curse

# Text-Dependent Questions

***Directions: For the following questions, choose the best answer or respond in complete sentences.***

1. PART A: What is the meaning of the word "trifling" as it is used in paragraph 3?
    A. unpredictable
    B. fulfilling
    C. unimportant
    D. laborious

2. PART B: Which word used in the story is most similar in meaning to "trifling?"
    A. sedate (Paragraph 2)
    B. indispensable (Paragraph 5)
    C. lethargic (Paragraph 5)
    D. trivial (Paragraph 6)

3. PART A: What is the impact of the narrator's statement, "I should have been quite delighted with his application, had he been cheerfully industrious" (Paragraph 4) on the passage as a whole?
    A. It introduces the narrator's unreasonable attitude toward his employees.
    B. It foreshadows the narrator's deep interest in understanding Bartleby.
    C. It reveals that the narrator enjoys working side by side with his employees at all times.
    D. It indicates that the narrator will be able to objectively assess Bartleby's strengths and weaknesses.

4. PART B: Which quotation from the passage most directly supports the answer to Part A?
    A. "I should have stated before that ground glass folding-doors divided my premises into two parts, one of which was occupied by my scriveners, the other by myself. According to my humor I threw open these doors, or closed them." (Paragraph 3)
    B. "It is, of course, an indispensable part of a scrivener's business to verify the accuracy of his copy, word by word." (Paragraph 5)
    C. "But there was something about Bartleby that not only strangely disarmed me, but in a wonderful manner touched and disconcerted me." (Paragraph 21)
    D. "He briefly gave me to understand that on that point my judgment was sound. Yes: his decision was irreversible." (Paragraph 25)

5. PART A: How does the narrator's description of his office in paragraph 3 function in the context of the story as a whole?
    A. It suggests the narrator's unawareness of the way others in the office might show their working environment.
    B. It reveals a negative aspect of the narrator's personality because the other scriveners refuse to occupy the same office as the narrator.
    C. It illustrates that the other scriveners, despite being in the same predicament as Bartleby, exhibit no sympathy for Bartleby.
    D. It highlights the contrast between Bartleby's comfortable working environment and his negative attitude toward work.

## Character Map

**Instructions:** Choose 2 characters from the narrative and chart their character traits. Be sure to cite the evidence of your choices in the box as well.

| **Character 2 Name** | **Physical and Emotional Character Traits** | **What behaviors does the character exhibit? What motivates him/her ?** | **How does this character change over time?** |
|---|---|---|---|
| | **What challenges does this character face?** | **How do others react to the character?** | |

| **Character 1 Name** | **Physical and Emotional Character Traits** | **What behaviors does the character exhibit? What motivates him/her ?** | **How does this character change over time?** |
|---|---|---|---|
| | **What challenges does this character face?** | **How do others react to the character?** | |

**Day 4 - Character Blog**

**Review the sample blog**.

## A Young Capulet in Love

*"Did my heart love till now? ...*

Posted by Juliet Capulet on May 11, 2020

Oh Romeo...you looked so hot at the dance! Why must my name be Juliet? Our parents won't let us be together--everyone knows that! You are a Montague, and I am a Capulet. Out families **HATE** each other. What are we to do? How can we ever be together? Just they other day I saw your cousins fighting with mine. Blood shed seems to be the only solution to a problem, I suppose. You know, I was wondering...what happened that made our families hate each other so? I'm nearly fourteen, and for as long as I can remember, they've been feuding. I just want us to be together--get married, live happily ever after. If I never see you again, I hope you remember me. Remember my big brown eyes, long brown hair, and smile as bright as the sun, that lit up the world when I first saw you. Mostly, remember my heart; for it belongs to you. Will we ever be together? Is fate real? Is it our destiny that we saw each other at the dance? I can't help but think it was meant for me to love you. Do you feel the same way? I feel like our destiny has already been decided for us in a way because of our parents. They will keep us apart. "My only love sprung from my only hate! Too early seen unknown, and known too late! Prodigious birth of love it is to me, that I must love a loathed enemy" (Act 1, Scene V). Hate is never justified. Hate hurts other people and gets in the way of true love. Hate can kill. Will loving you be the end of us? I believe we will encounter more obstacles, perhaps the loss of one of our cousins who stupidly fight each other. Or perhaps, our parents will be told about us. Adieu sweet love.

**Task**

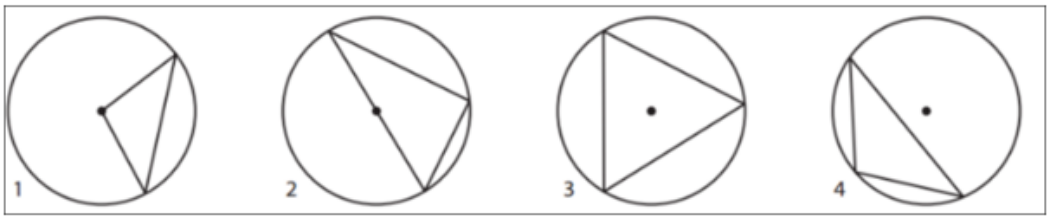
Review your character map. Choose one of the characters to be the voice of your blog.
Write a blog from the point of view of your character. The blog must include **ALL** of the following.

- The blog must focus on an event, another character, thought or action of the character.
- 2-4 posts with different dates written from the perspective of your character from various points in the action of the text. Each post must have at least 150 words. Keep in mind that blog posts will appear from most recent to oldest, so if you want your posts to flow chronologically, you should begin at the end of the story and move toward the beginning.
- At least one post must have a related image within it. Use picture cutouts or your own illustrations.
- Include a fake website link that relates to the blog. For example, if the character is talking about sandwiches include a fake link to Bombsandwiches.com . (Internet links are underlined within text.)
- A header with a title that matches your character and blog content, with a quote related to your character from the story as a subtitle.
- A photo of your character (as you imagine him or her) at the bottom with a brief description of your character (role in life, relationships, goals, location, etc.)

**IM3 – Week of June 8th**

**Reasoning with If-Then Statements**

## Which One Doesn't Belong? Why?




Concept Summary Assess

**CONCEPT SUMMARY** Conditional Statements

| STATEMENT | Conditional | Converse | Inverse | Contrapositive | Biconditional |
|---|---|---|---|---|---|
| SYMBOLS | $p \rightarrow q$ | $q \rightarrow p$ | $\sim p \rightarrow \sim q$ | $\sim q \rightarrow \sim p$ | $p \leftrightarrow q$ |
| WORDS | If $p$, then $q$. | If $q$, then $p$. | If not $p$, then not $q$. | If not $q$, then not $p$. | $p$ if and only if $q$. |

# Conditional Statements Worksheet 1

1. A square has four congruent sides and four right angles.

   **Write the conditional.**

   If a quadrilateral has four congruent sides and four _____, then it is a _____.

   **Write the converse.**

   If a quadrilateral is a _____, then it has four congruent sides and four _____.

   **Write the biconditional.**

   A quadrilateral is a _____ if and only if it has four congruent sides and four _____.

   **Write the inverse.**

   If a quadrilateral does not have four congruent sides and four _____, then it is not a _____.

   **Write the contrapositive.**

   If a quadrilateral is not a _____, then it does not have four congruent sides and four _____.

2. Nicky writes, "If I am a bird, then I fly," as an example of a conditional statement. Also, Nicky claims that the hypothesis is "I fly." Is Nicky correct? If not, correct the error.

3. Match each statement with the type of conditional.

| | |
|---|---|
| If I am a bird, then I fly. | Converse |
| If I am not a bird, then I do not fly. | Inverse |
| If I fly, then I am a bird. | Conditional |
| If I do not fly, then I am not a bird. | Biconditional |
| I fly if and only if I am a bird. | Contrapositive |

# Conditional Statements Worksheet 2

**Write each sentence as a conditional.**

1. A regular hexagon has exactly six congruent sides.

2. Two supplementary angles form a line.

**Determine the truth value of each conditional. Explain your reasoning or give a counterexample.**

3. If a figure has four congruent angles, then the figure is a square.

4. If the sidewalks are wet, then it has been raining.

**Write the negation of each part of the conditional. Then write the converse, the inverse, and the contrapositive. Determine the truth value of each new statement.**

5. If a figure is a square, then it is a rectangle.

6. If the game is field hockey, then the game is a team sport.

7. Write a biconditional for the following conditional. Determine the truth value of the new statement. *If two lines have the same slope, then they are parallel.*

8. **Understand** Write the Distributive Property of Multiplication Over Addition as a conditional statement.

9. **Apply** The number of people in the United States who are at least 100 years old grew about 66% from 1980 to 2010. Write that information as a conditional statement.

# Conditional Statements Worksheet 3

1. Identify the hypothesis and conclusion of the following statement: *A rectangle must have four congruent angles.*

   A polygon is a rectangle.

   The polygon has four congruent angles.

2. What is the truth value of the following statement?

   *If a number is divisible by 3, then it is odd.*

3. Which statement is the converse of the following conditional? *If it is raining, then the ground is wet.*

   Ⓐ If it is not raining, then the ground is not wet.

   Ⓑ If the ground is not wet, then it is not raining.

   Ⓒ If the ground is wet, then it is not raining.

   Ⓓ If the ground is wet, then it is raining.

4. Identify the biconditional for the following statement.

   *If M is the midpoint of $\overline{AB}$, then $\overline{AM} \cong \overline{MB}$.*

   Ⓐ *M* is the midpoint of $\overline{AB}$ only if $\overline{AM} \cong \overline{MB}$.

   Ⓑ $\overline{AM} \cong \overline{MB}$ only if *M* is the midpoint of $\overline{AB}$.

   Ⓒ *M* is the midpoint of $\overline{AB}$ if and only if $\overline{AM} \cong \overline{MB}$.

   Ⓓ If $\overline{AM} \cong \overline{MB}$, then *M is the midpoint of* $\overline{AB}$.

5. Identify the conditionals and truth values implied by the following biconditional. Select all that apply.

   *Two lines are parallel if and only if they do not intersect.*

   Ⓐ If two lines are parallel, then they do not intersect; T.

   Ⓑ If two lines are not parallel, then they intersect; F.

   Ⓒ If two lines do not intersect, then they are parallel; T.

   Ⓓ If two lines do not intersect, then they are parallel; F.

# Conditional Statements Worksheet 4

**You can string together several conditional statements to form a conditional chain, or logic chain. If the first condition is met, then all other conditions will be met.**

**If the bell rings, then it is time to be dismissed.**
**If it is time to be dismissed, then our teacher will dismiss us.**
**If our teacher dismisses us, then we go to our next class.**

**The contrapositive of a conditional chain negates all statements and reverses their order. The contrapositive has the same truth value as the conditional.**

**If we are not going to our next class, then our teacher has not dismissed us.**
**If our teacher has not dismissed us, then it is not time to be dismissed.**
**If it is not time to be dismissed, then the bell has not rung.**

1. Write the contrapositive for the following conditional chain.

   If there is thunder, the cat is frightened.
   If the cat is frightened, it hisses and puffs up its tail.
   If the cat hisses and puffs up its tail, the dog runs into another room to get away from the cat.

2. From algebra, the Transitive Property of Equality is a conditional chain.

   If $a = b$ and $b = c$, then $a = c$.

   Write a transitive property for congruence of line segments. (**Hint:** Use the $\cong$ sign.)

3. Order the statements into a conditional chain with at least three conditionals. Then write the contrapositive of the conditional chain.

   If I read it, then I will answer the message.
   If my cell phone chirps, then I have a text message.
   If I have a text message, then I will read it.

   Conditional Chain

   Contrapositive

# CC Standards Practice Week 10

**Selected Response**

**1.** Is the following statement true? If it is false, choose a correct counterexample.

If a number is prime, then it is odd.

Ⓐ True

Ⓑ False; 4 is even.

Ⓒ False; 15 is odd.

Ⓓ False; 2 is even.

**2.** What appears to be the next two terms in the sequence?

b, e, h, k, n,...

Ⓐ q, t

Ⓑ o, p

Ⓒ q, s

Ⓓ n, q

**Constructed Response**

**3.** Use the Law of Detachment to draw a conclusion. If it is not possible, then state why.

If you receive a score greater than 75, then you pass the class.

You received a score of 82.

**Extended Response**

**4.** Use the following statement.

If the three sides of a triangle have the same length, the triangle is equilateral.

**a.** What is the inverse of the statement?

**b.** What is the converse of the statement?

**c.** What can you conclude with the following statement using the Law of Syllogism?

If a triangle is equilateral, then each angle of the triangle measures 60°.

# What is the carbon cycle?

By NASA Earth Observatory, adapted by Newsela staff on 03.29.17
Word Count **1,470**
Level **1080L**

Carbon is both the foundation of all life on Earth and the source of the majority of energy consumed by human civilization. Swamp ecosystems like this one in Norway are a carbon sink that take carbon out of the atmosphere. Photo: Pixabay/Public Domain

Carbon is the backbone of life on Earth. We are made of carbon, we eat carbon, and our civilizations — our economies, our homes, our means of transport — are built on carbon. We need carbon, but that need is also connected with one of our most serious problems: global climate change.

Carbon is the fourth most abundant element in the universe. Most of Earth's carbon — about 65,500 billion metric tons — is stored in rocks. The rest is in the ocean, atmosphere, plants, soil and fossil fuels.

Carbon flows between each of them in an exchange called the carbon cycle. There is both a slow carbon cycle and a fast carbon cycle. Any change in the cycle that shifts carbon out of one area puts more carbon in the others. When carbon gases end up in the atmosphere, temperatures get warmer on Earth.

Over the long term, the carbon cycle seems to maintain a balance. This balance helps keep Earth's temperature relatively stable, like a thermostat. This thermostat works over a few hundred

thousand years, as part of the slow carbon cycle. This means that for shorter time periods, from tens to a hundred thousand years, the temperature of Earth can vary. The Earth swings between ice ages and warmer interglacial periods on this time scale.

Over much longer periods of millions or tens of millions of years, the temperature may change more dramatically. Earth has undergone such a change over the last 50 million years.

### The Slow And Steady Cycle Begins With Rain

Carbon takes 100 to 200 million years to move between rocks, soil, ocean and atmosphere in the slow carbon cycle. On average, 10 to 100 million metric tons of carbon move through the slow carbon cycle every year. In comparison, human emissions of carbon to the atmosphere are 10 to 100 times more than that.

The movement of carbon from the atmosphere to rocks begins with rain. Atmospheric carbon combines with water to form a weak acid that falls to the surface in rain. The acid dissolves rocks and releases calcium, magnesium, potassium or sodium. Rivers carry them to the ocean.

In the ocean, the calcium is combined with bicarbonate ions to form calcium carbonate. In the modern ocean, most of the calcium carbonate is made by shell-building creatures, such as corals, and plankton. After they die, they sink to the seafloor, and over time, layers of shells and minerals are cemented together and turn to rock, storing the carbon in limestone.

Only 80 percent of carbon-containing rock is currently made this way. The remaining 20 percent contains carbon from living things that have been embedded in layers of mud. Over millions of years, heat and pressure on the mud and carbon form sedimentary rock such as shale. In special cases, when dead plant matter builds up faster than it can break down, layers of carbon become oil, coal or natural gas instead of sedimentary rock.

The slow cycle returns carbon to the atmosphere through volcanoes. When volcanoes erupt, they vent the carbon dioxide to the atmosphere and cover the land with fresh rock to begin the cycle again. At present, humans release about 100 to 300 times more carbon dioxide than volcanoes by burning fossil fuels.

If volcanoes raise the carbon dioxide in the atmosphere, temperatures rise, leading to more rain. That dissolves more rock, which will eventually deposit more carbon on the ocean floor. This takes a few hundred thousand years to rebalance.

However, the slow carbon cycle also contains a slightly faster part: the ocean. The ocean absorbs and ventilates carbon dioxide at the surface. Once in the ocean, carbon dioxide gas reacts to make the ocean more acidic.

Since human activity has increased carbon concentrations in the atmosphere, the ocean now takes more carbon from the atmosphere than it releases. Over thousands of years, the ocean will absorb up to 85 percent of the extra carbon, but the process is slow because it is tied to the movement of water from the ocean's surface to its depths. Changes in ocean temperatures and ocean currents probably helped remove carbon from and then restore it to the atmosphere over the few thousand years in which the ice ages began and ended.

### Plants, Phytoplankton Are Key To Fast Carbon Cycle

The fast carbon cycle is largely the movement of carbon through life forms on Earth. Between 1,000 to 100,000 million metric tons of carbon move through the fast carbon cycle every year.

Carbon plays an essential role in life on Earth. That's because carbon can form up to four bonds per atom in what seems like an endless variety of complex organic molecules. For instance, DNA is made of two intertwined molecules built around a carbon chain. The bonds in the long carbon chains contain a lot of energy. When the chains break apart, the stored energy is released. This energy makes carbon molecules an excellent source of fuel for all living things.

Plants and phytoplankton are the main parts of the fast carbon cycle. Phytoplankton, which are microscopic organisms in the ocean, and plants take carbon dioxide from the atmosphere by absorbing it into their cells. They use energy from the sun and combine carbon dioxide ($CO_2$) and water to form sugar ($C_6H_{12}O_6$) and oxygen. The chemical reaction looks like this:

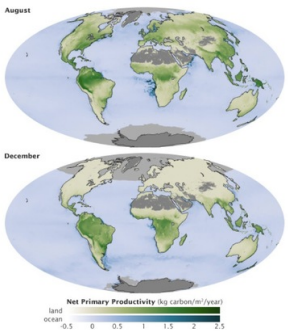
$6CO_2 + 6H_2O + \text{energy} \rightarrow C_6H_{12}O_6 + 6O_2$

Four things can happen to move carbon from a plant and return it to the atmosphere. Plants break down the sugar to get the energy they need to grow. Animals (including people) eat the plants or plankton, and break down the plant sugar to get energy. Plants and plankton die or decay at the end of the growing season. Or, fire consumes plants. In each case, oxygen combines with sugar to release water, carbon dioxide and energy. The basic chemical reaction looks like this:

$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{energy}$

In all four processes, the carbon dioxide released in the reaction usually ends up in the atmosphere. The fast carbon cycle is very closely tied to plant life. As a result, the growing season can be seen by the way carbon dioxide fluctuates in the atmosphere. In the Northern Hemisphere winter, few land plants are growing and many are decaying, so atmospheric concentrations climb. During the spring, when plants begin growing again, concentrations drop. It is as if the Earth is literally breathing.

### Cycle Responds To Changing Temperatures




The fast carbon cycle is visible in the changing seasons. As the large land masses of Northern Hemisphere green in the spring and summer, they draw carbon out of the atmosphere.

These maps show the amount of carbon consumed by plants on land (green) and in the oceans (blue) during August and December, 2010. In August, the green areas of North America, Europe, and Asia represent plants using carbon from the atmosphere to grow.

Graph by Marit Jentoft-Nilsen and Robert Simmon, using data from the NOAA Earth System Research Laboratory. Maps by Robert Simmon and Reto Stöckli/NASA.

Left undisturbed, the fast and slow carbon cycles maintain a relatively steady concentration of carbon in the atmosphere, land, plants and ocean. When anything changes the amount of carbon in one area, though, the effect ripples through the others.

Throughout Earth's history, the carbon cycle has changed in response to the changing climate. When the Earth gets cooler, the carbon cycle slows. The carbon in the atmosphere decreases, and that causes additional cooling. The opposite happens when temperatures rise.

Today, changes in the carbon cycle are happening because of people. We affect the carbon cycle by burning fossil fuels and clearing land.

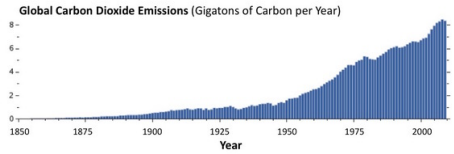
When we clear forests, we eliminate plants that would otherwise take carbon out of the atmosphere as they grow. We also expose soil that vents carbon from decayed plant matter into the atmosphere. Humans are currently emitting just under a billion tons of carbon into the atmosphere per year through land use changes.

Without human interference, the carbon in fossil fuels would leak slowly into the atmosphere over millions of years. By burning coal, oil and natural gas, we accelerate the process, releasing vast amounts of carbon that took millions of years to accumulate into the atmosphere every year. By doing so, we move the carbon from the slow cycle to the fast cycle.

### Land, Plants And The Ocean Soak Up Extra Carbon

Since people first started burning fossil fuels, carbon dioxide concentrations in the atmosphere have risen by 39 percent, the highest concentration in two million years. The concentration has risen from about 280 parts per million (ppm) to around 400 parts per million. That means that for every million molecules in the atmosphere, 400 of them are now carbon dioxide.

All of this extra carbon needs to go somewhere. So far, land, plants, and the ocean have taken up about 55 percent of the extra carbon people have put into the atmosphere while about 45 percent has stayed in the atmosphere. Eventually, the land and oceans will take up most of the extra carbon dioxide, but as much as 20 percent may remain in the atmosphere for many thousands of years.

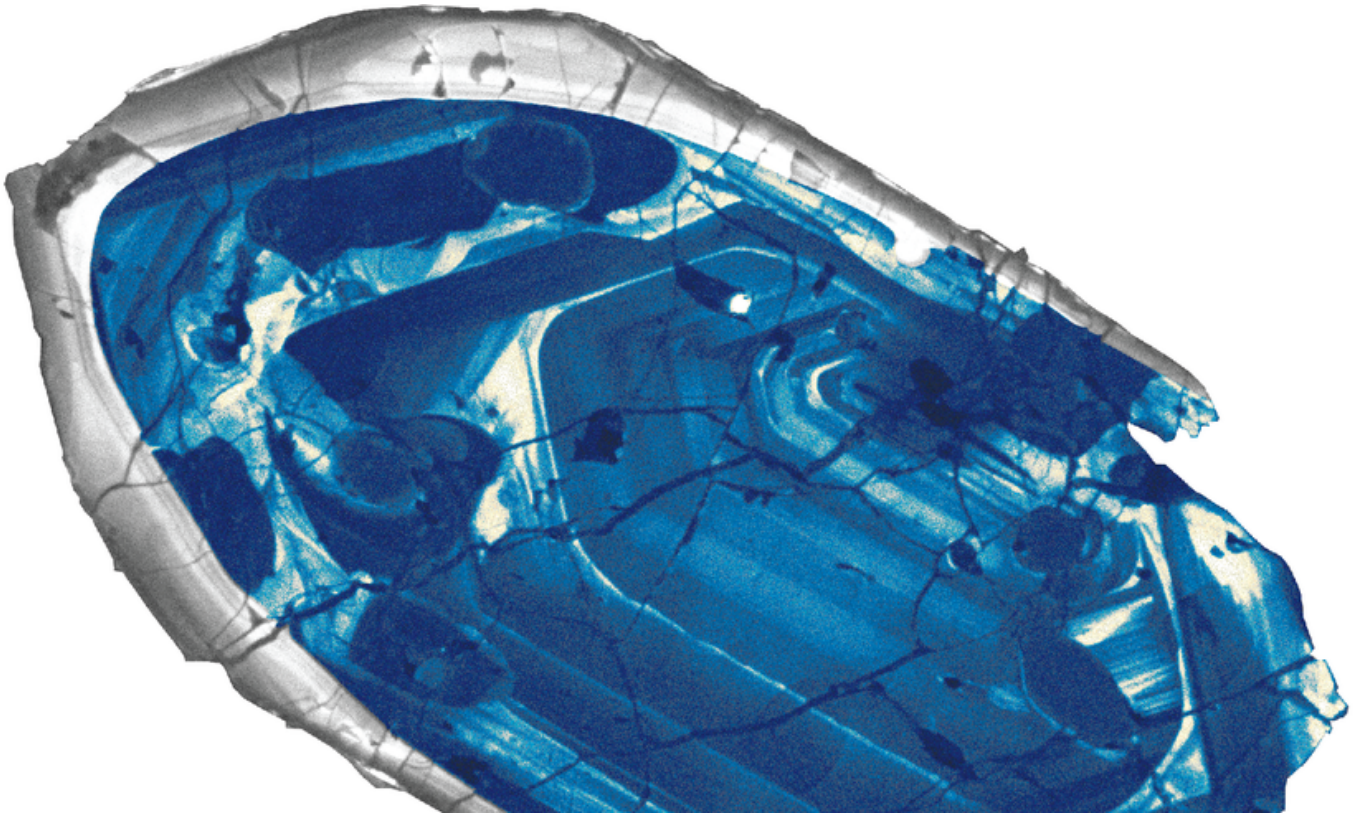



Emissions of carbon dioxide by humanity have been growing steadily since the onset of the industrial revolution. About half of these emissions are removed by the fast carbon cycle each year, the rest remain in the atmosphere. Graph: NASA.

Excess carbon in the atmosphere warms the planet and helps plants on land grow more. Excess carbon in the ocean makes the water more acidic, putting marine life in danger.

# Zircon crystal sheds new light on Earth's formation

By Milwaukee Journal Sentinel, adapted by Newsela staff on 03.07.14
Word Count **742**
Level **1110L**



This 4.4 billion-year-old zircon crystal is providing new insight into how the Earth cooled from a ball of magma and formed continents much earlier than previously believed. John Valley

A zircon crystal found on a sheep ranch in Australia is the oldest piece of the Earth's crust to be discovered, shedding new light on our planet's formation.

The zircon, which was embedded in sandstone, is described in the journal Nature Geoscience as about 4.4 billion years old and much smaller than a grain of rice. But the tiny crystal carries tremendous significance: It is evidence that by that point in its history, Earth had gone from a superheated ball of molten rock to a solid surface eventually capable of supporting life.

"One of the main goals of the space program is to understand if there's life elsewhere in the universe," said John Valley, a University of Wisconsin professor who led the study. Scientists in Australia, Canada and Puerto Rico also took part in the work.

By studying how the conditions of life came together on our planet, scientists believe we will learn what to look for on other planets.

## "It's Very Significant"

But the earliest rocks and first evidences of life have been subject to dispute over the years. Some scientists, for example, maintain that the earliest evidence of life is about 3.8 billion years old and found in Isua, Greenland. Skeptics, however, note that no fossils were found in the Greenland rock. They point instead to 3.5 billion-year-old evidence of life found in rocks in Pilbara, Australia.

That's a difference of 300 million years between the rocks found in Australia and Greenland.

The age of the zircon described by the Valley team, however, does not appear to be in dispute. The Valley team used a new technique called atom-probe tomography, which allowed them to confirm the accuracy of the crystal's age.

The new instrument, made in Wisconsin, is so sensitive that researchers were able to identify the atomic number and mass of each atom in the sample. Periodic tables used in chemistry are organized by the atomic numbers of elements. The number of protons in an atom of an element is its atomic number. For instance, hydrogen has just one proton in its atom, so it's the first element on the periodic table.

"I think they have shown unequivocally, beyond a shadow of a doubt, that this grain is that old," said Samuel Bowring, an expert in the early history of the Earth and a geology professor at the Massachusetts Institute of Technology. Bowring was not involved in the new study.

"It's only one grain, mind you," he added, "but it's very significant."

## Pieces Of The Planet's Crust

Jim Mattinson, a professor of earth science at University of California, Santa Barbara, said zircons have been found previously that were about the same age as the one in the current paper. But, the earlier discoveries were met with doubt.

"This paper drives a nail into that coffin (of doubt)," Mattinson said. "We're really getting back as far as we can go in the Earth's geologic records."

Zircon crystals are composed mainly of the elements zirconium, silicon and oxygen. Small amounts of uranium also appear in zircon.

The uranium decays at a set rate, forming lead. Because of these characteristics, scientists can use the lead and any remaining uranium in a zircon crystal to calculate the age.

Zircon is found embedded in younger rock. Valley found the zircon used for the current study in sandstone collected in the dry Jack Hills of western Australia, a region known to contain some of the oldest pieces of the planet's crust.

"The oldest rock in Australia was collected not far from where we were working," Valley said.

## Zircon Endures

Dating of the zircon helps clarify an early chapter in the Earth's history. Scientists have theorized that one of the critical early events occurred when an asteroid roughly the size of Mars struck a glancing blow to the Earth, vaporizing the mantle and crust. Dust from the collision merged to form the moon.

The enormous energy from the collision transformed the surfaces of the Earth and moon into oceans of molten rock. Both the earth and moon later cooled. Zircon was one of the minerals formed when the planet cooled.

Although minerals also were formed as far back in history, what makes zircon so valuable to geologists is its ability to endure. Zircon is a very hard mineral with stable chemistry able to survive extreme temperatures.

“We like to say that zircons are forever,” Valley said. “They really persist in the rock record.”

Responsible for the Korean War?

| | |
|---|---|
| Benchmark Standard | History 3a: Students will compare competing historical narratives, by contrasting different historians' choice of questions, use and choice of sources, perspectives, beliefs, and points of view, in order to demonstrate how these factors contribute to different interpretations. |
| Grade Band | 11-12 |
| Vocabulary / Key Concepts | **Communism**: is a political and economic ideology that positions itself in opposition to liberal democracy and capitalism, advocating instead a classless system in which the **means** of production are owned communally and private property is nonexistent or severely curtailed.<br>**Capitalism**: an economic and political system in which a country's trade and industry are controlled by private owners for profit, rather than by the state.<br>**Truman Doctrine**: the principle that the US should give support to countries or peoples threatened by Soviet forces or Communist insurrection. First expressed in 1947 by US President Truman in a speech to Congress seeking aid for Greece and Turkey, the doctrine was seen by the Communists as an open declaration of the Cold War.<br>**Marshall Plan**: also known as the European Recovery Program, was a U.S. program providing aid to Western Europe following the devastation of World War II. It was enacted in 1948 and provided more than $15 billion to help finance rebuilding efforts on the continent. |

***~This is a Stanford History Education Group (SHEG) lesson, modified by CSD for use at home~***

**ACTIVITY 1:** Answer the following questions on a separate sheet of paper based on what you think – your opinion.

1. Why might textbooks from different countries offer different versions of the same historical events?
2. When textbooks offer conflicting accounts, how do you decide which textbook to believe?

Read the following information.

FYI-

- textbooks, like other historical documents we have looked at, have a bias and often offer only one perspective on the past.
- History textbooks are often influenced by a country's national perspective and geographic and geo-political relationship to other countries.

Today, you are going to look at two different textbook accounts of the start of the Korean War and try to figure out where they come from, and which one offers the most trustworthy account.

Background information:

- Korean War was the first hot war of the Cold War: 1950-1953.
- During Second World War, the Allies decided to divide Korea at the 38th parallel. The North was under the trusteeship of the Soviet Union, the South under the trusteeship of the Americans. Two different countries developed: the North became a communist country, the South a non-communist, democratic country.
- Both sides wanted to re-unify the country under their own rule.
- In 1950, after a number of small skirmishes at the border, war broke out between North and South Korea. The US backed and fought with the South, and China fought with a backed the North.
- Initially, American and United Nations forces pushed deep into North Korea; however, China entered the war and pushed the Americans backed into the South.
- After three years, the two sides fought to a stalemate and kept the country divided at the 38th parallel.
- Our job today is think about the question: Who started the Korean War?

**ACTIIVTY 2:**

Read the two textbook accounts of the Korean War, one from North Korea and the other from South Korea. Then answer the questions on a separate sheet of paper.

**Textbook A**

Upset by the fast and astonishing growth of the power of the Republic, the American invaders hastened the preparation of an aggressive war in order to destroy it in its infancy....The American imperialists furiously carried out the war project in 1950....The American invaders who had been preparing the war for a long time, alongside their puppets, finally initiated the war on June 25th of the 39th year of the Juche calendar. That dawn, the enemies unexpectedly attacked the North half of the Republic, and the war clouds hung over the once peaceful country, accompanied by the echoing roar of cannons.

Having passed the 38th parallel, the enemies crawled deeper and deeper into the North half of the Republic...the invading forces of the enemies had to be eliminated and the threatened fate of our country and our people had to be saved.

**Textbook B**

When the overthrow of the South Korean government through social confusion became too difficult, the North Korean communists switched to a stick-and-carrot strategy: seeming to offer peaceful negotiations, they were instead analyzing the right moment of attack and preparing themselves for it.

The North Korean communists prepared themselves for war. Kim Il-sung secretly visited the Soviet Union and was promised the alliance of the Soviets and China in case of war. Finally, at dawn on June 25th, 1950 the North began their southward aggression along the 38th parallel. Taken by surprise at these unexpected attacks, the army of the Republic of Korea (South Korea) fought courageously to defend the liberty of the country....The armed provocation of the North Korean communists brought the UN Security Council around the table. A decree denounced the North Korean military action as illegal and as a threat to peace, and a decision was made to help the South. The UN army constituted the armies of 16 countries—among them, the United States, Great Britain and France—joined the South Korean forces in the battle against the North.

**Guiding Questions:**

1. According to Textbook A, how did the Korean War start?
2. According to Textbook B, how did the Korean War start?
3. Which of these textbooks do you find more trustworthy? Why? Use specific examples from each text to support your answer.).
4. Where else would you look in order to figure out how the Korean War started?

**Sources:**

Which of the following sources is for Textbook A and which is for Textbook B?

Source 1

- *Kim, Doojin. Korean History: Senior High. (Seoul, South Korea: Dae HanTextbook Co.), 2001.*
  Textbook _____
  Provide language from the textbook excerpt to support your answer.

Source 2

- *History of the Revolution of our Great Leader Kim Il-sun: High School. (Pongyang, North Korea: Textbook Publishing Co., 1999).*
  Textbook _____
  Provide language from the textbook excerpt to support your answer.

**Citations**

History of the Revolution of our Great Leader Kim Il-sun: High School. (Pongyang, North Korea: Textbook Publishing Co., 1999), 125-127.

Doojin Kim, Korean History: Senior High. (Seoul, South Korea: Dae Han Textbook Co., 2001), 199.