Christina School District Assignment Board

Student's First & Last Name_____ Student ID/Lunch # _____ School _____ Grade_____

Grade Level: 9th

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. --- Read the narrative **"Bleak House "** As you read, annotate words, phrases that identify characterization of all characters.	Answer the Text-Dependent Questions 1-5.	Reread or skim the text. 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 (IM1/ Algebra 1)	*Transformations of Exponential Functions* *Answer "Which One Doesn't Belong?" and justify your choice.*	Complete Transformations of Exponential Functions Worksheet 2 #1-11. (attached) Refer to Concept Summary if needed.	Read pages 78-80. Complete p. 81 #1-4. (attached) Refer to examples and Concept Summary if needed.	Read pages 78-80. Complete p. 81 #5-7. (attached) Refer to examples and Concept Summary if needed.	Complete Transformations of Exponential Functions Worksheet 3 #1-6. (attached) Refer to Concept Summary if needed.

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	(attached) Read Concept Summary: Translations of Exponential Functions. Complete Transformations of Exponential Functions Worksheet 1 # 1-4. (attached)				
Science	**Issue Overview: Confronting Coal (part 1):** Read article. In GREEN, highlight or underline potential benefits (pros) of using coal as a fuel source. In YELLOW, highlight or underline any potential liabilities (cons). NOTE: Consider ethical, social, environmental, economic, and/or political benefits and liabilities.	**Issue Overview: Confronting Coal (part 2):** Reread article and/or notations as necessary. Write a claim that answers the following: Is "clean coal" a valid replacement for coal as it is found naturally beneath Earth's surface? Support your claim with relevant data or evidence from the article. Then, justify why the data or evidence supports your claim.	**The Effects of Air Pollution (part 1):** **Read article. In YELLOW, highlight or underline information regarding causes of air pollution. In RED, highlight or underline the potential effects of air pollution. Add any questions you may have as annotations.**	**The Effects of Air Pollution (part 2):** Reread article and/or notations as necessary. Write a claim that answers the following: How does air pollution affect humans on the Earth's surface? What details from the text help you support your claim? Think about what you read about air pollution then explain how the details support your claim.	**Final Writing Prompt:** In a paragraph, relate the coal industry to rates of air pollution. What are the potential effects of these emissions upon human health and global climate? Be sure to include specific information from both articles in order to defend your claims.
Social Studies	Complete Activity 1, Activity 2, and Activity 3 from the document titled, "The Unique Nature of Places-PART 4	Complete Activity 4 from the document titled, "The Unique Nature of Places-PART 4"	Complete Activity 5 from the document titled, "The Unique Nature of Places-PART 4"	Complete Activity 6, Question 1 from the document titled, "The Unique Nature of Places-PART 4"	Complete Activity 6, Question 2 from the document titled, "The Unique Nature of Places-PART 4"

Name: _____ Class: _____

Excerpt from Bleak House

By Charles Dickens
1853

Charles Dickens (1812-1870) was an English writer and social critic. He is considered one of the best novelists of the Victorian era, the time during Queen Victoria's reign. In this excerpt from his novel Bleak House*, Mr. Skimpole asks the narrator to pay off his debt to avoid jail. As you read, take notes on how Mr. Skimpole approaches the narrator and Richard about paying his debt.*

[1] Mr. Skimpole could play on the piano and the violoncello,[1] and he was a composer — had composed half an opera once, but got tired of it — and played what he composed with taste. After tea we had quite a little concert, in which Richard — who was enthralled by Ada's singing and told me that she seemed to know all the songs that ever were written — and Mr. Jarndyce, and I were the audience. After a little while I missed first Mr. Skimpole and afterwards Richard, and while I was thinking how could Richard stay away so long and lose so much, the maid who had given me the keys looked in at the door, saying, "If you please, miss, could you spare a minute?"

"Untitled" by Christian Dubovan is licensed under CC0

When I was shut out with her in the hall, she said, holding up her hands, "Oh, if you please, miss, Mr. Carstone says would you come upstairs to Mr. Skimpole's room. He has been took, miss!"

"Took?" said I.

"Took, miss. Sudden," said the maid.

[5] I was apprehensive that his illness might be of a dangerous kind, but of course I begged her to be quiet and not disturb any one and collected myself, as I followed her quickly upstairs, sufficiently to consider what were the best remedies to be applied if it should prove to be a fit. She threw open a door and I went into a chamber, where, to my unspeakable surprise, instead of finding Mr. Skimpole stretched upon the bed or prostrate[2] on the floor, I found him standing before the fire smiling at Richard, while Richard, with a face of great embarrassment, looked at a person on the sofa, in a white great-coat, with smooth hair upon his head and not much of it, which he was wiping smoother and making less of with a pocket-handkerchief.

"Miss Summerson," said Richard hurriedly, "I am glad you are come. You will be able to advise us. Our friend Mr. Skimpole — don't be alarmed! — is arrested for debt."

1. formal term for "cello"
2. lying on the ground, face downward

"And really, my dear Miss Summerson," said Mr. Skimpole with his agreeable candour,[3] "I never was in a situation in which that excellent sense and quiet habit of method and usefulness, which anybody must observe in you who has the happiness of being a quarter of an hour in your society, was more needed."

The person on the sofa, who appeared to have a cold in his head, gave such a very loud snort that he startled me.

"Are you arrested for much, sir?" I inquired of Mr. Skimpole.

[10] "My dear Miss Summerson," said he, shaking his head pleasantly, "I don't know. Some pounds, odd shillings, and halfpence, I think, were mentioned."

"It's twenty-four pound, sixteen, and sevenpence ha'penny,"[4] observed the stranger. "That's wot it is."

"And it sounds — somehow it sounds," said Mr. Skimpole, "like a small sum?"

The strange man said nothing but made another snort. It was such a powerful one that it seemed quite to lift him out of his seat.

"Mr. Skimpole," said Richard to me, "has a delicacy in applying to my cousin Jarndyce because he has lately — I think, sir, I understood you that you had lately—"

[15] "Oh, yes!" returned Mr. Skimpole, smiling. "Though I forgot how much it was and when it was. Jarndyce would readily do it again, but I have the epicure-like[5] feeling that I would prefer a novelty[6] in help, that I would rather," and he looked at Richard and me, "develop generosity in a new soil and in a new form of flower."

"What do you think will be best, Miss Summerson?" said Richard, aside.

I ventured to inquire, generally, before replying, what would happen if the money were not produced.

"Jail," said the strange man, coolly putting his handkerchief into his hat, which was on the floor at his feet. "Or Coavinses."

"May I ask, sir, what is—"

[20] "Coavinses?" said the strange man. "A 'ouse."[7]

Richard and I looked at one another again. It was a most singular thing that the arrest was our embarrassment and not Mr. Skimpole's. He observed us with a genial[8] interest, but there seemed, if I may venture on such a contradiction, nothing selfish in it. He had entirely washed his hands of the difficulty, and it had become ours.

3. **Candor** ***(noun):*** the quality of being open and honest in expression
4. halfpenny
5. "Epicure" refers to someone with a refined taste.
6. **Novelty** ***(noun):*** the quality of being new, original, or unusual
7. This refers to a workhouse, which was a prison where petty offenders are expected to work.
8. **Genial** ***(adjective):*** friendly and cheerful

"I thought," he suggested, as if good-naturedly to help us out, "that being parties in a Chancery suit concerning (as people say) a large amount of property, Mr. Richard or his beautiful cousin, or both, could sign something, or make over something, or give some sort of undertaking, or pledge, or bond? I don't know what the business name of it may be, but I suppose there is some instrument within their power that would settle this?"

"Not a bit on it," said the strange man.

"Really?" returned Mr. Skimpole. "That seems odd, now, to one who is no judge of these things!"

[25] "Odd or even," said the stranger gruffly, "I tell you, not a bit on it!"

"Keep your temper, my good fellow, keep your temper!" Mr. Skimpole gently reasoned with him as he made a little drawing of his head on the fly-leaf of a book. "Don't be ruffled by your occupation. We can separate you from your office; we can separate the individual from the pursuit. We are not so prejudiced as to suppose that in private life you are otherwise than a very estimable man, with a great deal of poetry in your nature, of which you may not be conscious."

The stranger only answered with another violent snort, whether in acceptance of the poetry-tribute or in disdainful rejection of it, he did not express to me.

"Now, my dear Miss Summerson, and my dear Mr. Richard," said Mr. Skimpole gaily, innocently, and confidingly as he looked at his drawing with his head on one side, "here you see me utterly incapable of helping myself, and entirely in your hands! I only ask to be free. The butterflies are free. Mankind will surely not deny to Harold Skimpole what it concedes to the butterflies!"

"My dear Miss Summerson," said Richard in a whisper, "I have ten pounds that I received from Mr. Kenge. I must try what that will do."

[30] I possessed fifteen pounds, odd shillings, which I had saved from my quarterly allowance during several years. I had always thought that some accident might happen which would throw me suddenly, without any relation or any property, on the world and had always tried to keep some little money by me that I might not be quite penniless. I told Richard of my having this little store and having no present need of it, and I asked him delicately to inform Mr. Skimpole, while I should be gone to fetch it, that we would have the pleasure of paying his debt.

When I came back, Mr. Skimpole kissed my hand and seemed quite touched. Not on his own account (I was again aware of that perplexing and extraordinary contradiction), but on ours, as if personal considerations were impossible with him and the contemplation of our happiness alone affected him. Richard, begging me, for the greater grace of the transaction, as he said, to settle with Coavinses (as Mr. Skimpole now jocularly[9] called him), I counted out the money and received the necessary acknowledgment. This, too, delighted Mr. Skimpole.

His compliments were so delicately administered that I blushed less than I might have done and settled with the stranger in the white coat without making any mistakes. He put the money in his pocket and shortly said, "Well, then, I'll wish you a good evening, miss.

9. intended for joking

"My friend," said Mr. Skimpole, standing with his back to the fire after giving up the sketch when it was half finished, "I should like to ask you something, without offence."

I think the reply was, "Cut away, then!"

[35] "Did you know this morning, now, that you were coming out on this errand?" said Mr. Skimpole.

"Know'd it yes'day aft'noon at tea-time," said Coavinses.

"It didn't affect your appetite? Didn't make you at all uneasy?"

"Not a bit," said Coavinses. "I know'd if you wos missed to-day, you wouldn't be missed to-morrow. A day makes no such odds."

"But when you came down here," proceeded Mr. Skimpole, "it was a fine day. The sun was shining, the wind was blowing, the lights and shadows were passing across the fields, the birds were singing."

[40] "Nobody said they warn't, in MY hearing," returned Coavinses.

"No," observed Mr. Skimpole. "But what did you think upon the road?"

"Wot do you mean?" growled Coavinses with an appearance of strong resentment. "Think! I've got enough to do, and little enough to get for it without thinking. Thinking!" (with profound contempt).

"Then you didn't think, at all events," proceeded Mr. Skimpole, "to this effect: 'Harold Skimpole loves to see the sun shine, loves to hear the wind blow, loves to watch the changing lights and shadows, loves to hear the birds, those choristers[10] in Nature's great cathedral. And does it seem to me that I am about to deprive Harold Skimpole of his share in such possessions, which are his only birthright!' You thought nothing to that effect?"

"I—certainly—did—NOT," said Coavinses, whose doggedness in utterly renouncing the idea was of that intense kind that he could only give adequate expression to it by putting a long interval between each word, and accompanying the last with a jerk that might have dislocated his neck.

[45] "Very odd and very curious, the mental process is, in you men of business!" said Mr. Skimpole thoughtfully. "Thank you, my friend. Good night."

10. members of a choir

Text-Dependent Questions

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

1. PART A: Which circumstance most surprises the narrator in the passage?
    A. how upset the maid is
    B. how unpleasant the strange man is
    C. how unconcerned Mr. Skimpole is
    D. how amazed Richard is

2. Which quotation best supports the answer to Part A?
    A. "'He has been took, miss!'" (Paragraph 2)
    B. "'Our friend Mr. Skimpole — don't be alarmed! — is arrested for debt.'" (Paragraph 6)
    C. "'My dear Miss Summerson,' said he, shaking his head pleasantly, 'I don't know.'" (Paragraph 10)
    D. "'Odd or even,' said the stranger gruffly, 'I tell you, not a bit on it!'" (Paragraph 25)

3. PART A: What impact does Mr. Skimpole's remark in paragraph 15 that he wishes to "'develop generosity in a new soil and in a new form of flower'" have on the passage?
    A. It emphasizes Mr. Skimpole's poetically offhand view of his situation.
    B. It illustrates the extent to which Mr. Skimpole is embarrassed about the past.
    C. It introduces a feeling of tension that builds throughout the passage.
    D. It creates a sense of fellowship between Mr. Skimpole and the other characters.

4. PART B: Which quotation from the passage has a similar impact as the answer to Part A?
    A. "'Some pounds, odd shillings, and a halfpence, I think, were mentioned.'" (Paragraph 10)
    B. "'I don't know what the business name of it may be, but I suppose there is some instrument within their power that would settle this?'" (Paragraph 22)
    C. "'I only ask to be free. The butterflies are free. Mankind will surely not deny to Harold Skimpole what it concedes to the butterflies!'" (Paragraph 28)
    D. "'Did you know this morning, now, that you were coming out on this errand?'" (Paragraph 35)

5. PART A: Which statement describes a way in which Mr. Skimpole attempts to obtain the money he needs?
    A. He shows great respect for the stranger to prove his innocence.
    B. He preoccupies himself with fanciful pursuits to avoid facing reality.
    C. He behaves charmingly to Miss Summerson to appear as if he is doing her a favor.
    D. He asks thought-provoking questions to show off his philosophical talents.

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

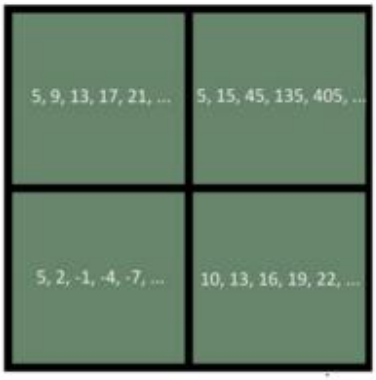
Review your character map. Choose one of the characters to be the voice of your blog.
Write a blog from the point of view of your character. The blog must include **ALL** of the following.

- 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.)

IM1/Algebra 1 – Week of June 8th

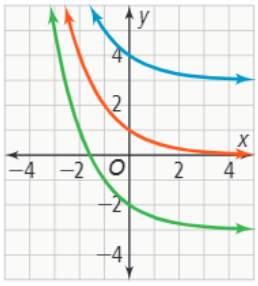
Transformations of Exponential Growth

Which One Doesn't Belong? Why?



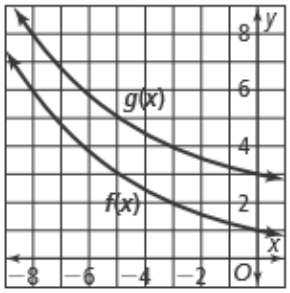
Concept Summary Assess

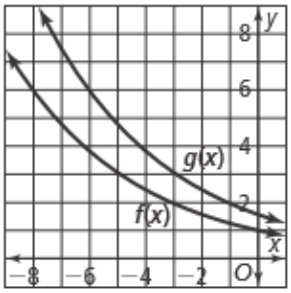
CONCEPT SUMMARY Translations of Exponential Functions

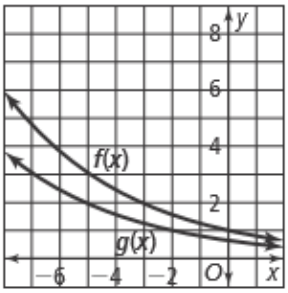
	Vertical Translations	Horizontal Translations
ALGEBRA	$f(x) = a^x + k$	$f(x) = a^{(x-h)}$
NUMBERS	$f(x) = 0.5^x$ $g(x) = 0.5^x + 3$ $j(x) = 0.5^x - 3$	$f(x) = 0.5^x$ $g(x) = 0.5^{x+3}$ $j(x) = 0.5^{x-3}$
GRAPHS		

Transformations of Exponential Growth Worksheet 1

1. In each graph shown, the graph of g is a translation of the graph of $f(x) = 0.8^x$. Draw a line from each function g to its graph.







$g(x) = 0.8^x + 2$ $g(x) = 0.8^{x+2}$ $g(x) = 0.8^{x-2}$

Write *negative* or *positive* in the blanks to complete each statement.

2. When $g(x) = a^x + k$ is a vertical translation downward of $f(x) = a^x$, k is _____.

3. When $g(x) = a^{x-h}$ is a horizontal translation to the left of $f(x) = a^x$, h is _____.

4. Tom incorrectly identified one of the features of the graph of $f(x) = 8^x - 1$. Put an X next to the incorrect statement. Describe his error.

a. The value of a is 8, which is greater than 1, so the graph of f increases as x increases.

b. The value of h is 1, so the graph is translated 1 unit left from the graph of $f(x) = 8^x$.

c. The value of k is −1, so the graph is translated 1 unit down from the graph of $f(x) = 8^x$.

d. The asymptote of the graph of f is $y = -1$.

Transformations of Exponential Growth Worksheet 2

Consider $f(x) = 3^x$. Describe how the graph of each function compares to f.

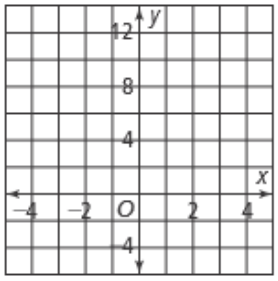
1. $g(x) = 3^x + 4$

2. $h(x) = \left(\frac{1}{4}\right)^{x-5}$

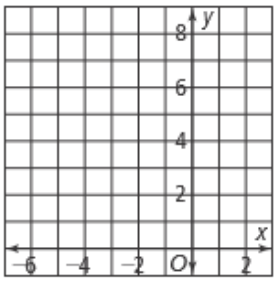
3. $j(x) = 3^{x+6} - 2$

Graph each function.

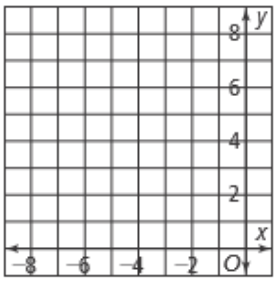
4. $g(x) = 2^x - 3$



5. $h(x) = \left(\frac{1}{2}\right)^{x+3}$



6. $j(x) = 4^{x+4} + 3$



Consider $g(x) = 3^x - 3$. What is an equation for each graph in terms of g?

7. y-intercept is 0

8. y-intercept is 8

9. y-intercept is −3

10. Is the asymptote of an exponential function transformed by a horizontal or vertical translation? Explain.

11. In Major League Baseball, excluding the wildcard round, a total of 8 teams participate in the postseason playoffs. Teams pair up each round to play against each other. The winner of each round goes on to play another winning team. In each round, the losing team is eliminated from the playoffs. Discuss the features of the graph that models the playoff scenario. Is the playoff graph a continuous or discrete graph? Explain.

In these sections, students generalize what they have learned about geometric sequences to investigate exponential functions. Students study exponential functions of the form $y = ab^x$. Students look at multiple representations of exponential functions, including graphs, tables, equations, and context. They learn how to move from one representation to another. Students learn that the value of a is the "starting value" of the function—a is the y-intercept or the value of the function at $x = 0$. b is the growth (multiplier). If $b > 1$ then the function increases; if b is a fraction between 0 and 1 (that is, $0 < b < 1$), then the function decreases (decays). In this course, values of $b < 0$ are not considered.

For additional information, see the Math Notes boxes in Lesson 7.1.3 and 7.2.3. For additional examples and more practice, see the Checkpoint 9 and Checkpoint 10A materials at the back of the student textbook.

Example 1

LuAnn has \$500 with which to open a savings account. She can open an account at Fredrico's Bank, which pays 7% interest, compounded monthly, or Money First Bank, which pays 7.25%, compounded quarterly. LuAnn plans to leave the money in the account, untouched, for ten years. In which account should she place the money? Justify your answer.

Solution: The obvious answer is that she should put the money in the account that will pay her the most interest over the ten years, but which bank is that? At both banks the principal (the initial value) is \$500. Fredrico's Bank pays 7% compounded monthly, which means the interest rate is $\frac{0.07}{12} \approx 0.00583$ each month. If LuAnn puts her money into Fredrico's Bank, after one month she will have:

$$500 + 500(0.00583) = 500(1.00583) \approx \$502.92.$$

To calculate the amount at the end of the second month, we must multiply by 1.00583 again, making the amount:

$$500(1.00583)^2 \approx \$505.85.$$

At the end of three months, the balance is:

$$500(1.00583)^3 \approx \$508.80.$$

This will happen every month for ten years, which is 120 months. At the end of 120 months, the balance will be:

$$500(1.00583)^{120} \approx \$1004.43.$$

Note that this last equation is an exponential function in the form $y = ab^x$, where y is the amount of money in the account and x is the number of months (in this case, 120 months). $a = 500$ is the starting value (at 0 months), and $b = 1.00583$ is the multiplier or growth rate for the account each month.

Example continues on next page →

Example continued from previous page.

A similar calculation is performed for Money First Bank. Its interest rate is higher, 7.25%, but it is only calculated and compounded quarterly. (Quarterly means four times each year, or every three months.) Hence, every quarter the bank calculates $\frac{0.0725}{4} = 0.018125$ interest. At the end of the first quarter, LuAnn would have:

$$500(1.018125) \approx \$509.06.$$

At the end of ten years (40 quarters) LuAnn would have:

$$500(1.018125)^{40} \approx \$1025.69.$$

Note that this last equation is an exponential function in the form $y = ab^x$, where y is the amount of money in the account and x is the number of quarters (in this case, 40 quarters). $a = 500$ is the starting value (at 0 quarters), and $b = 1.018125$ is the multiplier or growth rate for the account each quarter.

Since Money First Bank would pay her approximately $21 more in interest than Fredrico's Bank, she should put her money in Money First Bank.

Example 2

Most homes appreciate in value, at varying rates, depending on the home's location, size, and other factors. But if a home is used as a rental, the Internal Revenue Service allows the owner to assume that it will depreciate in value. Suppose a house that costs $150,000 is used as a rental property, and depreciates at a rate of 8% per year. What is the multiplier that will give the value of the house after one year? What is the value of the house after one year? What is the value after ten years? When will the house be worth half of its purchase price? Draw a graph of this situation.

Solution: Unlike interest, which increases the value of the house, depreciation takes value away. After one year, the value of the house is $150000 - 0.08(150000)$ which is the same as $150000(0.92)$. Therefore the multiplier is 0.92. After one year, the value of the house is $150000(0.92) = \$138{,}000$. After ten years, the value of the house will be $150000(0.92)^{10} = \$65{,}158.27$.

This last equation is an exponential function in the form $y = ab^x$, where y is the value of the house and x is the number of years. $a = 150000$ is the starting value (at 0 years), and $b = 0.92$ is the multiplier or growth factor (in this case, decay) each year.

To find when the house will be worth half of its purchase price, we need to determine when the value of the house reaches $75,000. We just found that after ten years, the value is below $75,000, so this situation occurs in less than ten years. To help answer this question, list the house's values in a table to see the depreciation.

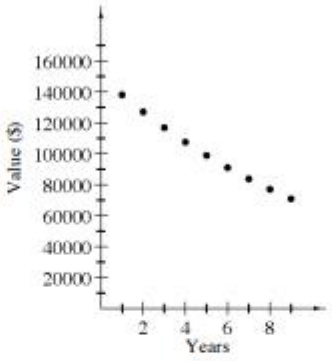
Example continues on next page →

Example continued from previous page.

From the table or graph, you can see that the house will be worth half its purchase price after 8 years.

Note: You can write the equation $75000 = 150000 \cdot 0.92^x$, but you will not have the mathematics to solve this equation for x until a future course. However, you can use the equation to find a more exact value: try different values for x in the equation, so the y-value gets closer and closer to \$75,000. At about 8.313 years the house's value is close to \$75,000.

# Years	House's value
1	138000
2	126960
3	116803.20
4	107458.94
5	98862.23
6	90953.25
7	83676.99
8	76982.83
9	70824.20



Example 3

Write an equation that represents the function in this table.

Week	Weight of Bacterial Culture (g)
1	756.00
2	793.80
3	833.49

The exponential function will have the form $y = ab^x$, where y is the weight of the bacterial culture, and x is the number of weeks. The multiplier, b, for the weight of the bacterial culture is 1.05 (because $793.80 \div 756 = 1.05$ and $833.49 \div 793.80 = 1.05$, etc.). The starting point, a is not given because we are not given the weight at Week 0. However, since the growth is 1.05 every week, we know that $(1.05) \cdot$ (weight at Week 0) = 756.00g. The weight at Week 0 is 720g, thus $a = 720$. We can now write the equation:

$$y = 720 \cdot 1.05^x,$$

where y is the weight of the bacterial culture (g), and x is the time (weeks).

Problems

1. In seven years, Seta's son Stu is leaving home for college. Seta hopes to save $8000 to pay for his first year. She has $5000 now and has found a bank that pays 7.75% interest, compounded daily. At this rate, will she have the money she needs for Stu's first year of college? If not, how much more does she need?

2. Eight years ago, Rudi thought that he was making a sound investment by buying $1000 worth of Pro Sports Management stock. Unfortunately, his investment depreciated steadily, losing 15% of its value each year. How much is the stock worth now? Justify your answer.

3. Based on each table below, find the equation of the exponential function $y = ab^x$.

a.

x	$f(x)$
0	1600
1	2000
2	2500
3	3125

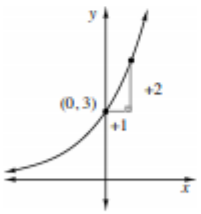
b.

x	y
1	40
2	32
3	25.6

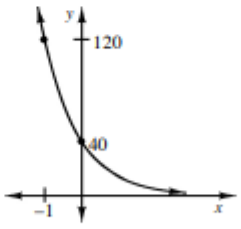
4. The new Bamo Super Ball has a rebound ratio of 0.97. If you dropped the ball from a height of 125 feet, how high will it bounce on the tenth bounce?

5. Based on each graph below, find the equation of the exponential function $y = ab^x$.

a.



b.



6. Fredrico's Bank will let you decide how often your interest will be computed, but with certain restrictions. If your interest is compounded yearly you can earn 8%. If your interest is compounded quarterly, you earn 7.875%. Monthly compounding earns a 7.75% interest rate, while weekly compounding earns a 7.625% interest rate. If your interest is compounded daily, you earn 7.5%. What is the best deal? Justify your answer.

7. Fully investigate the graph of the function $y = \left(\frac{3}{4}\right)^x + 4$. See Describing Functions (Lessons 1.1.3 through 1.2.2) in this *Parent Guide with Extra Practice* for information on how to fully describe the graph of a function.

Transformations of Exponential Growth Worksheet 3

Each given set of numbers is part of the range of values for an exponential function, with the domain being consecutive whole number values. Find the exponential function for each range of values given.

1. 2, 3, 5, 9, 17, 33, ...	**2.** 0, 2, 8, 26, 80, ...
3. −2, 2, 22, 122, 622, ...	**4.** $-\frac{5}{6}$, 0, 5, 35, 215, ...
5. 5, 17, 65, 257, 1,025, ...	**6.** 10, 3, $\frac{17}{8}$, $\frac{129}{64}$, $\frac{1,025}{512}$, ...

Issue Overview: Confronting coal

By Bloomberg, adapted by Newsela staff on 09.18.16
Word Count **760**
Level **970L**

TOP: Heavy vehicles move newly blasted coal following a timed detonation at the Buckskin Coal Mine in Gillette, Wyoming, June 13, 2006. Photo by Robert Nickelsberg. BOTTOM: Graphics by the International Energy Agency.

We can't live with it, and we can't live without it. Coal is a major contributor to global warming, and the heating up of the Earth. It is also cheap and plentiful. The power and warmth it generates have helped to lift millions out of poverty in China, India and other nations.

Coal is easier to find than other energy sources and simpler to transport and store. There's more to it than just money; in Eastern Europe, there is much coal. People see it an alternative to Russian oil and gas. Efforts to limit coal use have spread. According to oil company BP, the world used 1.8 percent less coal in 2015, the largest drop since the company began keeping records in the mid-1960s. Nevertheless, coal makes up nearly one-third of the world's energy.

The Situation

Only oil is used more than coal as a source of energy. If we take coal out of the Earth at the same rate as we did in 2012, there is enough to last for about 132 years. China uses the most coal. The power it generates from coal fuels its growth, although its smoke chokes its cities. China, Japan

and India are the largest importers; Indonesia, Australia, Russia and the United States are the biggest exporters.

Germany's experience is a good example of the challenge of quitting using coal. In 2011, it began to burn more after shutting eight of its nuclear power stations following the Fukushima nuclear meltdown in Japan. Germany started two new coal-powered electricity plants in 2015. Burning coal emits almost twice as much carbon dioxide as natural gas and about one-quarter more pollution than heating oil. Carbon dioxide is a greenhouses gas that traps heat in the Earth's atmosphere and causes global warming.

That's why the United States has forced many of its coal-burning plants to close or undergo expensive upgrades to reduce pollution. Stricter laws have meant that coal- mining companies are not making a profit in many places. Peabody Energy is America's biggest coal miner and in April, it told a judge that it could not pay its bills. At least eight other U.S. coal producers in 2015 did the same thing.

DEFINITIONS

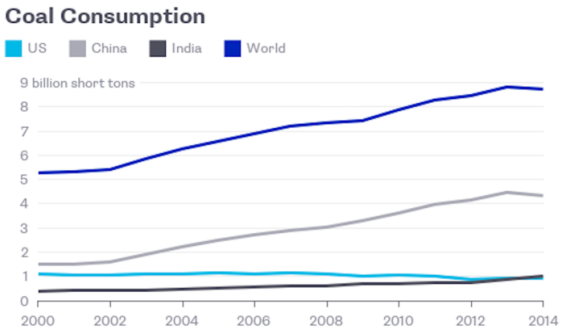
carbon dioxide
The gas released by burning fossil fuels such as coal

global warming
The warming up of Earth's atmosphere and oceans caused by air pollution

power plant
A building or group of buildings where electricity for a large area is produced

Coal use in 2015 decreased in the United States and China. One group of researchers argued that China will continue to use less coal. However, places such as Indonesia and India began using more of it. India pulled ahead of the United States as the world's second-biggest coal user in 2014.

The Background



People have always argued about coal. In 1306, England's King Edward I banned its use in London because of heavy smoke from its fires. Centuries later, coal powered the Industrial Revolution in the 1800s. Its smoke covered London in fogs that were common until the mid-20th century. The word "smog," in fact, was invented by a Londoner in 1905. In the United States, coal was first found near Richmond, Virginia, in 1791. Baltimore became the first American city to use it for street lights, starting in 1816.

The fuel powered the U.S. railroad system and enabled the country to expand westward. By the early 1900s, coal made the United Mine Workers the largest union representing workers in the United States. Its battles with mining companies over the pay and working conditions of coal miners were among the nation's bloodiest.

The Argument

There is no serious dispute about coal's contribution to climate change. There is much debate over what to do about it. In December 2015, almost 200 countries signed a plan in Paris to limit global warming. The European Union has used a system of permits to help curb carbon dioxide emissions, as have California and nine states in the northeastern United States. The impact has been modest.

Power plants in the United States have installed equipment to reduce sulfur dioxide emissions, another source of pollution, from burning coal. Technology has also made coal plants more efficient. The coal industry is claiming that they could remove as much as nine-tenths of the carbon that comes from burning coal. Coal mining companies are calling this "clean coal."

There are two problems, though. There is no proof that the technology works, and it's expensive. So there is plenty of opposition to clean coal from the other side, which argues that coal is best left in the ground. Some people are refusing to invest money in coal-related companies. The anti-coal movement is gaining ground. If coal use decreases, it is not clear what would replace it, or at what cost.

The effects of air pollution

By Gale/Cengage Learning, adapted by Newsela staff on 04.20.18
Word Count **1,033**
Level **1210L**

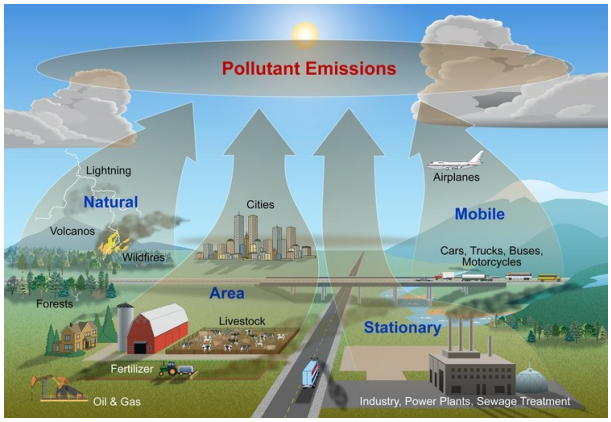
Image 1. Heavy smog on January 30, 2018, in Shanghai, China. The Shanghai Air Pollution Index (API) reached 235, indicating heavy pollution. Smog comes from ozone that is close to the Earth's surface. Ozone occurs naturally in the Earth's lower atmosphere, but near ground level, ozone is formed when pollutants emitted by cars, power plants, and factories react chemically in the presence of sunlight. Photo: VCG/VCG via Getty Images.

Air pollution refers to the substances in the Earth's atmosphere that are dangerous to human health or the environment. This pollution is usually considered anthropogenic, meaning "caused by humans." Although it can come from natural sources, most air pollution results from humans burning fossil fuels such as coal, oil and natural gas. Many serious problems are a result of air pollution, including ozone depletion, climate change, acid rain and respiratory illnesses.

The Earth's atmosphere is made up of several gases. The atmosphere contains 78 percent nitrogen, 21 percent oxygen, 0.4 percent water vapor, and – before the widespread use of fossil fuels – about 0.027 percent carbon dioxide. Carbon dioxide is released from burning fossil fuels, but also from cooking fires and slash-and-burn agriculture. Human actions caused the amount of carbon dioxide in the atmosphere to rise to 0.04 percent (400 parts per million) in 2015. This increase causes climate change.

The Greenhouse Effect

Understanding climate change requires understanding the greenhouse effect. This natural process happens when radiation from the sun enters the Earth's atmosphere. Half of this radiation is absorbed by the Earth's surface and half is converted to infrared radiation or heat energy. Some radiation bounces back up into space, but some get trapped in the atmosphere by greenhouse gases (GHGs), and the more GHGs in the atmosphere, the more heat is trapped. The main GHGs are carbon dioxide, methane, nitrous oxide and ozone.



In addition to causing climate change, air pollution also leads to health problems. The World Health Organization (WHO) estimated that in 2012 air pollution caused 7 million deaths worldwide from respiratory diseases, and called it "the world's largest single environmental health risk." City residents in developing countries can suffer the most from air pollution. They often live near unregulated factories or cook with open fires indoors.

Ozone Depletion

Ozone is a molecule made up of three atoms of oxygen. The ozone layer is a thin coating of these molecules 6 miles above the Earth. This layer prevents some of the sun's harmful radiation from reaching the Earth, but air pollution has damaged these protective ozone molecules. As a result, dangerous ultraviolet radiation reaches the Earth's surface and causes serious health problems, including skin cancer and eye diseases.

Aerosol spray bottles, air conditioners, and refrigerators used to contain chlorofluorocarbons (CFCs) and halogens, all of which harmed the ozone layer. Drifting up into the atmosphere, they destroyed ozone molecules and created two large holes at the North and South Poles. However, most ozone-depleting substances are now banned.

Acid Rain

Acid rain is rain, snow, or fog that is acidic. Acid rain forms when sulfur dioxide and nitrogen dioxide, released from burning fossil fuels, mixes with water, oxygen and other chemicals to form sulfuric and nitric acids in the atmosphere. These then mix with water and fall to the ground.

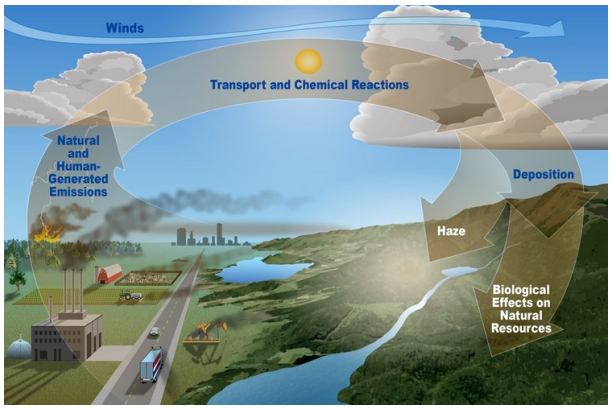
Acid rain harms both natural and built environments. It wears away buildings, cars and human structures. If lakes and rivers become too acidic, fish eggs might not hatch, and some fish may die. When acid rain falls on soil, it affects the balance of microorganisms, and soils that are too acidic make it hard for plants to absorb essential nutrients. Trees at high altitude are often harmed by acid rain, which damages their leaves and pine needles and stunts tree growth.

Climate Change

According to the U.S. Environmental Protection Agency (EPA), changes to Earth's climate are linked to more GHGs in the atmosphere. GHGs absorb radiation from the sun, keeping heat in the atmosphere instead of reflecting it back into space. When GHG particles fall on snow and ice, they melt faster, and fewer ice-covered surfaces mean less heat is reflected away from Earth. This process creates a feedback loop that increases average global temperatures while also melting

more snow and ice. With temperatures rising, the planet's glaciers and polar ice caps are dissolving, increasing sea levels worldwide.

Indoor Air Pollution



Most people think of air pollution as an outdoor problem, but indoor air pollution can also be harmful. Air pollution inside buildings is caused by cigarette smoke, cooking fires and chemicals given off by materials like carpeting, electronics and plastics. Older buildings can be contaminated with poisonous lead paint and asbestos dust. Mold, dust mites and other allergens spread through air conditioners and heating vents.

Indoor air pollution tends to be especially bad in developing countries. In these places, many people cook indoors over an open fire, a practice that creates pollution called "particulate" pollution, because it's made up of tiny particles. According to the WHO, 3.8 million people worldwide die each year from diseases and health conditions caused by household air pollution.

Stopping Air Pollution

Air pollution causes heart disease, strokes, lung cancer, acute lower respiratory system infections, and more. During the 1970s, many countries made laws to limit air pollution.

In the United States, the Clean Air Act of 1963 was the first legislation designed to limit air pollution. It was expanded twice to address acid rain and ozone depletion. The laws established air-quality standards and guidelines for motor vehicle and smokestack emissions. The substances regulated by the Clean Air Act include ozone, particulates, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. The EPA estimates that between 2010 and 2020, the Clean Air Act will prevent 230,000 early deaths. Their Acid Rain Program has also been successful. Between 1995 and 2011, sulfur dioxide emissions fell 64 percent, and nitrogen oxide emissions fell 67 percent.

Internationally, the most successful treaty dealing with air pollution was the United Nations' 1987 Montreal Protocol on Substances That Deplete the Ozone Layer.
The first universally approved treaty in U.N. history, every nation on Earth signed it. Everyone phased out ozone-depleting pollutants worldwide, and it had a significant impact. The hole in the ozone layer at the South Pole is now much smaller than it was in the past.

The Unique Nature of Places – Part 4

Benchmark Standard	Geography 3a: Students will understand the processes which result in distinctive cultures, economic activity, and settlement form in particular locations across the world.
Grade	9
Vocabulary / Key Concepts	Geographer

~This lesson is a part of the DRC Unit "The Unique Nature of Places" – Modified by CSD for use at home~

ACTIVITY 1: On a separate sheet of paper, analyze the city of Seaford seal and make predictions about the community based upon the words and graphics included.

Image courtesy Seaford, DE

ACTIVITY 2: Predict whether this community appeared to be economically wealthy. Explain why or why not.

ACTIVITY 3: Read the following information which is found on the Seaford, Delaware website: http://www.seafordde.com/index.cfm?ref=21100

"The original city seal was designed in 1961 by Gary R. Blake, a patrolman in the Seaford Police Department. Each part of the design of the seal was taken from the history of the City of Seaford and the State of Delaware, represented as follows:

Ship - represents Seaford's original name 'Hooper's Landing' and also shipping on the Nanticoke River

Figure One - represents Delaware, the First State

Sheaf of Wheat - represents farming

Corn - represents milling industries, located in Seaford

Holly - represents the State tree

Nylon - represents the nylon industry

Diamond - represents Delaware, the "Diamond State"

Chicken - represents poultry industry

Farmer - represents farming interest

Native American - represents the Nanticoke Tribe

... in 2003 the date 1865 was added to the bottom of the Seal to reflect the date in which the 'Town of Seaford' was incorporated"

Your Opinion:

- Why do you think that Seaford included the phrase “Nylon Capital of the World” on the seal?

ACTIVITY 4: Read the article, “The Nylon Capital of the World: Seaford, Delaware” and complete the questions on a separate sheet of paper:

The Nylon Capital of the World: Seaford, Delaware

In 1939, with nylon nearing full-scale production, DuPont sought a location for a new plant. The company chose a 609-acre site near Seaford in southern Delaware because of its proximity to raw material supplies and major markets. The rural community welcomed DuPont's $8.5 million investment with an impromptu parade. DuPont employed 900 construction workers and 400 subcontractors. In building the Seaford Village Housing Project, the company made Seaford a model of its community relations efforts. The initial project [nylon factory] was finished in a mere seven months, but even before completion the company began work on a second facility, doubling the site's capacity to 8 million pounds of nylon yarn a year. Seaford went into production on December 12, 1939; the first yarn produced is now on display at the Smithsonian Institution in Washington, D.C. The six-story plant ran 24 hours a day, producing in its first year of operation enough yarn for 64 million pairs of nylon stockings. Seaford lost many of its first male employees to the war effort, but female workers maintained essential national defense production of nylon for parachutes and B- 29 bomber tires. After the war, Seaford remained central to the company's textile fibers production program. In 1948 DuPont chemical engineers converted one of Seaford's production units into a pilot plant for "Fiber V," later to be known as Dacron®. Bulked Continuous Filament nylon, soon to be a standard in the carpet industry, was developed at Seaford in 1958, part of a larger effort by the Engineering and Textile Fibers departments to create an "optimum nylon plant".

Source: http://www2.dupont.com/Heritage/en_US/related_topics/seaford_de.html

1. According to the article, why was Seaford, DE chosen as the site of the nylon plant? Use the terms site and situation in your answer.
2. Underline or list details in the article that show how the new factory changed the town where the factory was built. Find as many as you can.

The Next Step

No finished products were ever produced at the Seaford plant. Nylon filaments were spun to make yarn. The yarn was shipped to factories that made useful items. At first the nylon made at the plant was made into women’s stockings, replacing silk. Hosiery mills sprung up in the mid-Atlantic region. During World War II, the nylon was a vital component of parachutes and tank tires used in the war effort. Many local factories were converted to war production. Later nylon fiber was in demand to make durable carpet. Carpet factories were clustered in the southern United States.

3. How might the changing use of the fiber affect the situation of the nylon plant? Explain.
4. The Seaford factory received chemical raw materials by rail. Diesel fuel to power its electric generating plant arrived by barge on the Nanticoke River. Finished nylon yarn was shipped out to factories by truck. Based on what you have learned, were these good transportation choices? Explain why you think this. Include a map or diagram if it helps you answer.

ACTIVITY 5:

- Predict what occurred in 2004 and how do you think it impacted Seaford’s economy?

Continue reading and answer the questions that follow.

Places Adapt to Economic Changes

Seaford, DE was experiencing high unemployment in the depression of the 1930’s, so the location of the DuPont nylon plant in Seaford was very welcome. Over the next fifty years, the economy of the town benefited from the large number of workers earning steady wages, taxes paid by the company and the money invested by DuPont in local facilities. When DuPont began to think about closing the plant, they gave local government some notice. Town leaders worked with the

company to attract other industries and businesses. Some of the firms even used the nylon factory and other facilities in new ways. The result was that Seaford survived what might have been a devastating blow. However, in 2004 DuPont sold the Seaford plant to Invista and in 2014 approximately 100 employees had jobs at the site compared to around 4,000 in the 1960's.

Thinking Like a Geographer:

1. How was the place of Seaford (think about the site and the situation) changed by the closing of the nylon plant and the opening of new industries?
2. For Fifty Years Seaford was proud to call itself "the Nylon Capital of the World". How might the town 'rebrand' itself to convey its new sense of place?
3. Cities in the past often identified with a single industry- and even named their sports teams to show that pride. What examples can you think of?
4. When might economic change lead to a change in the sports identity?

ACTIVITY 6: Checks for Understanding: Continue reading and answer the questions that follow:

During the 1980's and 90's, the auto industry in the US began to change. Americans began to buy more imported cars, and eventually foreign auto makers began to manufacture cars in the United States. The new auto plants were built far from Detroit, in states like Kentucky where energy costs were low and non-union workers accepted lower wages and fewer costly benefits. The new auto factories used efficient robotics and other sophisticated technology to produce high quality, affordable cars and trucks. US automakers responded to the challenge by closing older, less profitable plants. Michigan felt the effects first; plants there had been turning out cars for years and were becoming outdated. Cities like Detroit and Flint, Michigan, experienced massive lay-offs and factory closings. Once prosperous and full of promise, these cities became centers of urban blight. The automakers began to close less- profitable assembly plants on the East and West Coasts. In Newark, DE the closing of the Chrysler plant in 2008 caused a rise in unemployment claims and ripple effects were felt by local businesses. The Newark area had a diversified economy, including other small manufacturing facilities, retail businesses, banking and financial services, and a major university. Planners immediately began working on other ways to use the property. Local property values remained stable, even though individual workers were thrown out of work.

Thinking Like a Geographer

1. Why are property values less likely to fall drastically when a place has economic diversity? Explain your answer.
2. How might schools plan to help students prepare for a future as workers in a diversified economy? Support your answer with an example.