BOSTON Public Schools
Focus on Children

Office of
Instructional
Research and
Development

Science and Technology/Engineering

Common Writing Assignment: Science

Nutrients CWA

The Nutrients CWA is for the unit of organization for matter and energy flow in organisms, and is designed to be one assessment that you could use for that unit. The overarching questions are: *Which student's set of meals matches with each diet's nutritional content?* (part 1), and *Which of these diets is the best diet for fitness-for-life*? (part 2). The following handouts are included:

- Nutrients CERR (overarching question and data)
- Student Meals Worksheet
- How Do I Complete My Nutrients CERR Final Paper? (Instructions for students to write their Individual written response)
- Student Draft Worksheets
- Response Rubric
- Sample student response

Optional Resources: See Optional Activities section below
Nutrients CERR Part 2 Peer Review Rubric
Chapter 7 Nutrients CERR Small Group Debate

Students will need the following resources:
- [ ] Nutrients Reading & Vitamin Chart
- [ ] Textbook pp.336
- [ ] Information on recommended dietary allowances

This CWA is designed to be used for several days. The students are provided the "Nutrients CERR" handout, which includes the data that they will need to answer the questions. They should analyze the diets and make notes about their nutritional value. Scaffolds are then provided to support the development of their written responses (use: *How Do I Complete My Nutrients CERR Final Paper?* and *Student Draft Worksheets*).

Optional Activities
Teachers are encouraged to have students use peer critiquing practices – have them review another student's argument and provide feedback.

If you choose to have students practice arguing from a particular perspective, you could assign students into teams of three (triads) and have each of them develop an argument for one of the diets.

Name_____   Date_____

Nutrients CERR

Prompt: Three of your friends are arguing about the best diet in order to maintain fitness-for-life. After sitting through biology class, they ask you for a scientific argument of which diet is better. View their diets and the nutritional contents of the sample meals below. Determine which set of meals matches each diet's nutritional content. Then decide which diet is best for maintaining overall fitness-for-life. All diets are for a 125-150 pound person. Use your knowledge of the importance of nutrients to answer the question. There is a chart on TB p.336 that you may find helpful.

Student Meals		
Student A: • Scrambled eggs, sausage, and bacon • Glass of whole milk (8 oz.) • Ham salad sandwich with mayonnaise • Potato chips • String cheese • Steak • Mashed potatoes made with cream • Black beans **Diet: _____**	**Student B:** • Cereal with skim milk • Orange juice • Hamburger on a reduced fat bun • Grilled potato slices • Glass of skim milk (12 oz.) • Two Oranges • Fat free yogurt • Pasta with tomato sauce • Slice of Italian bread with low fat butter substitute • Glass of skim milk (12 oz.) • Strawberries **Diet: _____**	**Student C:** • Scrambled eggs with green pepper and shredded cheese • Whole wheat toast • Glass of 1% Milk (8 oz.) • Orange • Turkey sandwich with mustard and low-fat mayonnaise • Apple • Low fat yogurt • Grilled chicken breast • Spinach • Baked potato **Diet: _____**

Nutritional Content							
	Carbohydrate	**Lipid**	**Protein**	**Vitamin B$_6$**	**Vitamin C**	**Iron**	**Calcium**
Diet 1	450g	15g	15g	2mg	100mg	15mg	1050mg
Diet 2	280g	60g	55g	2mg	60mg	18mg	1000mg
Diet 3	50g	100g	150g	2mg	10mg	10mg	750mg

__Question__: Which student's set of meals matches with each diet's nutritional content? (Part 1), and which of these diets is the best diet for fitness-for-life (Part 2)? Use your understanding of biology to explain your choices.

Make sure you review the CERR rubric so you know the qualities on which you are being assessed. This is your first draft, but you should do the best you can. You will go through an editing process to create a second draft.

Don't Forget to...

Plan your writing using an outline, web or graphic organizer. As you write each draft of your assignment, it's important to use what you know as a writer to communicate your ideas effectively.

- ✓ Provide a clear <u>claim</u> that answers the question.
- ✓ Include <u>evidence</u> using data from class activities, experiments and other resources.
- ✓ Include <u>reasoning</u> to show how your evidence supports your claim.
- ✓ Use vocabulary that you have learned in science class.
- ✓ Correct grammar, punctuation, and spelling errors.

Claim: Write a statement that answers the question above. Be sure your claim addresses **_both_** parts of the question.

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Evidence: State the evidence that supports your claim. Your evidence needs to address **_both_** parts of the question.

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Reasoning: Justify your claim based on the evidence. Your reasoning must address **_both_** parts of the question.

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Rebuttal: Address an argument that someone who disagrees with you might make. Don't forget to argue why your claim is better.

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Make notes about the nutrients in each food for each diet below.

Student and Diet	Notes
Student A: • Scrambled eggs, sausage, and bacon • Glass of whole milk (8 oz.) • Ham salad sandwich with mayonnaise • Potato chips • String cheese • Steak • Mashed potatoes made with cream • Black beans Which diet number do you think is Student A's? **Diet #: _____**	
Student B: • Cereal with skim milk • Orange juice • Hamburger on a reduced fat bun • Grilled potato slices • Glass of skim milk (12 oz.) • Two Oranges • Fat free yogurt • Pasta with tomato sauce • Slice of Italian bread with low fat butter substitute • Glass of skim milk (12 oz.) • Strawberries Which diet number do you think is Student B's? **Diet #: _____**	
Student C: • Scrambled eggs with green pepper and shredded cheese • Whole wheat toast • Glass of 1% Milk (8 oz.) • Orange • Turkey sandwich with mustard and low-fat mayonnaise • Apple • Low fat yogurt • Grilled chicken breast • Spinach • Baked potato Which diet number do you think is Student C's? **Diet: # _____**	

How do I complete my Nutrients CERR Final Paper?

Put your final paper together as an essay. You should label the sections, but there should not be boxes, etc. The paper can be handwritten or typed. Either way, the final draft should 1) respond to teacher and student feedback; 2) be proofread; 3) be neatly written and organized.

Claim:
> Write the claim for both parts of the question. Remember to make clear, direct statements.

Evidence & Reasoning Part 1:
> Write your revised evidence and reasoning sections for the first part of the question – which diets match with which student's meals? You can write one section with all the evidence, followed by one section with all the reasoning, or you can write evidence for one student then reasoning for that student followed by another paragraph of evidence for a different student then its reasoning, etc. Choose the format that works best for you. This is YOUR summative assessment.

Evidence & Reasoning Part 2:
> Write your revised evidence and reasoning sections for the second part of the question – which **diet** is the best for fitness-for-life? Again, you can have one section of evidence followed by one section with all your reasoning, or you can break it up into smaller evidence/reasoning parts. Just be sure that each paragraph is written in complete sentences and sufficiently addresses the question.

Rebuttal
> Write your revised rebuttal to question 2. Remember that your rebuttal should have 3 parts: 1) introduce a possible counterclaim (a different diet); 2) give a reason someone might make this counterclaim; then 3) defend your claim. Even given the reason in 2, why is YOUR claim still better?

Work hard. Be gritty. Have hope. Know that you have all the potential to grow and be awesome at science and anything!

Due: _____

Your final draft should be stapled on top of your rough drafts and student meals worksheet.

Name_____   Date_____

Chapter 7 Nutrients CERR Part 1 Draft

Question: *Which student's set of meals matches with each diet's nutritional content?*

Claim:

Evidence:

Reasoning:

Evidence:

Reasoning:

Evidence:

Reasoning:

Chapter 7 Nutrients CERR Part 2 Draft

Question*: Which of these diets is the best diet for fitness-for-life?*

Claim:

Evidence:

Reasoning:

Evidence:

Reasoning:

Evidence:

Reasoning:

Rebuttal:

Nutrients CERR Rubric

	4 – Exemplary	3 – Proficient	2 – Needs Improvement	1 – Critical Area	Grade
Claim	□ Directly states the accurate matches between student meals and diets □ Accurately states best diet for fitness-for-life □ Written in complete, easy to understand sentence(s)	□ Directly states matches between meals and diets but 2 matches are inaccurate □ Accurately states best diet for fitness-for-life □ Written in complete, easy to understand sentence(s)	□ Directly and accurately states the accurate matches between meals and diets OR best diet for fitness-for-life □ Not written in complete, easy to understand sentence(s)	□ Does not make a claim, or makes a completely inaccurate claim.	
Evidence **weighted x 2**	Accurately describes: □ Student A foods that correspond to diet □ Student B foods that correspond to diet □ Student C foods that correspond to diet □ Data about recommended nutrient amounts/fitness-for-life and foods in diets	Mostly accurately describes the evidence for: □ Foods that corresponds to diets for 2 out of 3 student meals OR incompletely describe evidence for all 3 meals □ Data about recommended nutrient amounts/fitness-for-life □ May include inappropriate evidence	Mostly accurately describes the evidence for: □ Foods that corresponds to 1 out of 3 student meals OR incomplete evidence for 2 □ May or may not include data about recommended nutrient amounts/fitness-for-life □ May include inappropriate evidence	□ Accurately describes the evidence for at least 1 set of student meals OR fitness-for-life nutrient amounts □ Or only provides inappropriate evidence (evidence that does not support claim)	
Reasoning **weighted x 2**	Correctly and clearly… □ Gives reason for making matches between student meals and diets □ Explains why the identified diet is best for fitness-for-life □ Provides functions for all the relevant nutrients □ Connects reasons back to evidence and claim □ Uses scientific vocabulary □ Uses students' own words	Correctly and adequately… □ May or may not gives reason for making matches □ Explains why the identified diet is best for fitness-for-life □ Provides functions for at least 4 nutrients □ Some attempt to connect reasons back to evidence given and/or claim □ Uses mostly students' own wording	□ Correctly and adequately gives reasons for matches OR why identified diet is best for fitness-for-life but not both OR □ Incomplete reasoning for both parts of the question/claim □ Uses wording directly from notes, the textbook, or an outside source, that does not demonstrate clear understanding of the meaning, or □ Restates the evidence without connecting it to the claim	□ Does not provide reasoning, or only provides reasoning that does not accurately appropriately explain matches or fitness-for-life □ Provides an incomplete generalization, or does not apply any science vocabulary	

Rebuttal	☐ Correctly identifies a counter-claim by giving a reason someone might choose a different diet as best for fitness-for-life. ☐ Explains, in your own words, why your claim is a better claim than the counter-argument, using evidence and reasoning.	☐ Correctly identifies a counter-claim by giving a reason someone might choose a different diet as best for fitness-for-life. ☐ Explains, mostly in your own words, why your claim is a better claim than the counter-argument using some evidence and incomplete reasoning	☐ Makes some attempt at identifying a counter-argument but does not give a reason someone might make claim ☐ Includes incomplete or inappropriate explanation for why your claim is better	☐ Does not identify appropriate counter arguments, and/or ☐ Does not provide sufficient evidence to address counter arguments, or provides more support for the counter-argument then the original claim	
Writing	☐ Writing contains no grammatical or spelling errors ☐ Writing is clear, concise, and persuasive	☐ Writing contains very few grammatical or spelling errors ☐ Writing is clear, mostly concise, and well developed	☐ Writing is fairly clear, with some grammatical or spelling errors ☐ Writing could be more concise	☐ Writing is difficult to follow, with many grammatical errors and no clear structure ☐ Writing is either too wordy or too incomplete	
Rough Draft	☐ Rough drafts included & Final draft responds to Feedback on Rough Draft		☐ Rough draft included		

Part 1 Sample Response:

Claim: Given the meals and diets, student A matches with diet 3, student B matches with diet 1, and student C matches with diet 2.

Evidence:
 Student A ate bacon, sausage, ham, steak and beans. These are all meats and beans, which are high in protein. All the meats, minus the beans, also have fats in them. This student also ate fewer carbohydrates than students B and C.

Reasoning:
 Since student A ate many more proteins and fats than the other students, she matches with diet 3, which has the highest amounts of fat and protein compared to the other diets.

Evidence:
 Student B ate cereal, fruits (oranges, orange juice, strawberries), a bun, potatoes, pasta, bread, and milk. These types of foods have many carbohydrates. The fruits, including tomato sauce, also have vitamin C. There is very little meat in this diet and the person drinks skim milk so they would have little fat and protein. The multiple intakes of milk would also include calcium.

Reasoning:
 Given that Student B ate the most carbohydrates, vitamin C, and calcium and little fat and protein, this corresponds to diet 1. This diet similarly has the most amount of carbohydrate, calcium and protein and lowest of fat and protein. The lack of meat would also go with the low amount of iron.

Evidence:
 Student C eats a variety of foods with a variety of nutrients. The eggs, cheese, chicken, turkey, and yogurt would have protein and some fats, as well as iron. The toast, vegetables, fruit, bread, and potatoes would have carbohydrates. Fruits and vegetables would have some vitamin C and B6. The milk and yogurt also provide the person with some calcium. Student C seems to eat amounts of each nutrient that are in between the other students.

Reasoning:
 Since there are a variety of foods in Student C's diet in between the other two students, and Diet 2 also has amounts of each nutrient that are in between diets 1 and 3, student C matches with diet 2. Since student C eats a variety of meats and spinach, which would explain why s/he has the most iron.

Part 2 Sample Response:

Claim:

Diet 2 is the best diet for fitness-for-life; it has a balance of all the needed nutrients.

Evidence:

According to the data, the student with diet 2 ate 280 grams of carbohydrates, 55 grams of protein, 60 grams of fats, 60 milligrams vitamin C, 18 milligrams of iron, 2 milligrams of vitamin B6, and 1000 milligrams of calcium. These numbers are closest to the recommended amounts of each nutrient for teenagers: 300 grams carbohydrate, 50 grams protein, 67 grams lipid, 60 milligrams of vitamin C, 1.2-1.3 milligrams vitamin B6, 1100 milligrams calcium, and 15 milligrams iron. Diet 1 has high levels of carbohydrate and vitamin C and very low levels of fat and protein. Diet 3 has very low levels of carbohydrate and vitamin C and high levels of fat and protein.

Reasoning:

The reason the recommended amounts of nutrients represents the most balanced diet—diet 2—is because all nutrients provide different functions to keep the body healthy. Carbohydrates provide organisms with energy. A person with diet 1 would have excess carbohydrates that they would store as fat, yet a person with diet 3 would not have enough and have trouble producing enough energy for its cells. Proteins are important for building muscle, repairing tissues, making antibodies for the immune system, and making enzymes for chemical reactions in a body's cells. Diet 1 could cause someone to have trouble staying healthy, making tissues and muscle for the body, and being able to carry out all the necessary chemical reactions for a human body. Lipids are the main part of cell membranes and are also needed for long-term energy, insulation, and hormones. A person with diet 1 would have too much fat and store it in the body, which can be unhealthy for the heart and body. In diet 3, someone who does not get enough lipid could have trouble regulating body temperature, making healthy cells, and making hormones to regulate activity in the body.

In addition to these nutrients, vitamins and minerals are also important. All diets have the same amount of vitamin B6, which is needed for the immune system and energy. Diet 3 would not give a person enough vitamin C to have a healthy immune system. S/he also might not form healthy bones and teeth to due lower amounts of calcium, and s/he could have trouble carrying oxygen in the blood because of low iron. Diet 1 might not a hurt a person with higher amounts of these vitamins and minerals, but it could prevent the body from absorbing or using these or other nutrients. Since diet 2 provides the recommended nutrient amounts, this person would be able to maintain a healthy immune system, form healthy bones and teeth, and effectively carry oxygen through the blood to the body.

Rebuttal:

A counterargument might be that Diet 1 is the best diet for fitness-for-life because it has low amounts of fat, fat is bad for the body. While too much fat has negative effects, fat is needed to make cell membranes, hormones, and to help maintain body temperature in cold environments. Additionally, diet 1 is very high in carbohydrates. The person will not be able to use all the carbohydrates and will store it as fat anyway. Therefore, diet 2 with a balance of nutrients is the best for overall health.

The next pages support optional activities--

Peer Review Rubric for part 2 of the essay and a scaffold for a small group debate (each student in a triad assigned to argue for the healthiness of each of the three diets)

Nutrient CERR Part 2 Peer Review Rubric

Peer Grader Name		A – Exemplary	B – Proficient	C – Needs Improvement	D – Critical Area	Peer Grade
	Claim	☐ Accurately states best diet for fitness-for-life ☐ Written in complete, easy to understand sentence(s)	☐ Accurately states best diet for fitness-for-life ☐ Written in complete, easy to understand sentence(s)	☐ Accurately states the best diet for fitness-for-life but uses vague or unclear language, **OR** ☐ Inaccurately or incompletely answers the question, and/or ☐ Not written in complete, easy to understand sentence(s)	☐ Does not make a claim, or makes a completely inaccurate claim.	
	Evidence	Accurately describes: ☐ Appropriate diet 1 nutrient amounts ☐ Appropriate diet 2 nutrient amounts ☐ Appropriate diet 3 nutrient amounts ☐ Data about recommended nutrient amounts/fitness-for-life	Mostly accurately describes the evidence for: ☐ Appropriate nutrient amounts for 2 out of 3 diets ☐ Data about recommended nutrient amounts/fitness-for-life ☐ May include inappropriate evidence	Mostly accurately describes the evidence for: ☐ Appropriate nutrient amounts for 1 out of 3 diets OR ☐ May or may not include data about recommended nutrient amounts/fitness-for-life ☐ May include inappropriate evidence	☐ Only provides inappropriate evidence (evidence that does not support claim)	
	Reasoning	Correctly and clearly… ☐ Explains why the identified diet is best for fitness-for-life ☐ Provides functions for all the nutrients ☐ Consistently connects back to diet data ☐ Uses scientific vocabulary ☐ Uses students' own words	Correctly and adequately… ☐ Explains why the identified diet is best for fitness-for-life ☐ Provides functions for at least 4 nutrients ☐ Connects back to diet data frequently ☐ Uses mostly students' own wording	☐ Correctly and adequately provides functions of at least 3 nutrients ☐ Connects back to the diet data some times ☐ Uses wording directly from notes, the textbook, or an outside source, that does not demonstrate clear understanding of the meaning, or ☐ Restates the evidence without connecting it to the claim	☐ Correctly and adequately provides functions of 1-2 nutrients. ☐ Few connections back to diet data ☐ Provides an incomplete generalization, or does not apply any of science vocabulary	

	Rebuttal	☐ Correctly identifies a counter-claim by giving a reason someone might choose a different diet as best for fitness-for-life. ☐ Explains, in your own words, why your claim is a better claim than the counter-argument, using evidence and reasoning.	☐ Correctly identifies a counter-claim by giving a reason someone might choose a different diet as best for fitness-for-life. ☐ Explains, mostly in your own words, why your claim is a better claim than the counter-argument using some evidence and incomplete reasoning	☐ Makes some attempt at identifying a counter-argument but does not clearly identify another diet choice ☐ Includes incomplete or inappropriate explanation for why your claim is better	☐ Does not identify appropriate counter arguments, and/or ☐ Does not provide sufficient evidence to address counter arguments, or provides more support for the counter-argument then the original claim	
	Writing	☐ Writing contains no grammatical or spelling errors ☐ Writing is clear, concise, and persuasive	☐ Writing contains very few grammatical or spelling errors ☐ Writing is clear, mostly concise, and well developed	☐ Writing is fairly clear, with some grammatical or spelling errors ☐ Writing could be more concise	☐ Writing is difficult to follow, with many grammatical errors and no clear structure ☐ Writing is either too wordy or too incomplete	

Name_____   Date_____

Chapter 7 Nutrients CERR Small Group Debate

Question: *Which of these diets is the best diet for fitness-for-life?*

My Assigned Student: _____

Write an argument about why your assigned student's diet is the best diet for fitness-for-life. You will present this argument to the rest of your triad.

Claim:
Evidence:
Reasoning:

1. Each student should present his or her argument for 1-2 minutes.
2. Use the rubric to rate each of the other students' arguments. Instead of "written" or "writing", consider how the ideas were orally expressed.
3. Share the rubric ratings for each argument after the presenter is finished.
4. As a group, decide which student "won", and answer the questions on the other side.

- Which argument had the most persuasive evidence? Why?

- Which argument had the most persuasive reasoning? Why?

- Which argument was the most appropriate and accurate based on biology? Why?

- Based on your small group debate, which student has the best diet for fitness-for-life?

Names:

Triad Evaluation: As a triad, rate your performance. On the scale, 1 = strongly disagree, and 5 = strongly agree.

	SD	←--------→			SA
1. We were focused and on task almost all of the time.	1	2	3	4	5
2. We used our notes and resources to develop our arguments.	1	2	3	4	5
3. We demonstrated grit and continued working even we experienced challenges.	1	2	3	4	5
4. We demonstrated self-control. i.e. We resisted temptation to become distracted.	1	2	3	4	5
5. We demonstrated a growth mindset by trying to improve our understanding and CERR skills.	1	2	3	4	5
6. Group members demonstrated respect for each other.	1	2	3	4	5
7. All group members should be able to write a strong evidence-based argument about which diet is best for fitness-for-life.	1	2	3	4	5

Additional Comments or Questions:

Names:

Triad Evaluation: As a triad, rate your performance. On the scale, 1 = strongly disagree, and 5 = strongly agree.

	SD	←--------→			SA
1. We were focused and on task almost all of the time.	1	2	3	4	5
2. We used our notes and resources to develop our arguments.	1	2	3	4	5
3. We demonstrated grit and continued working even we experienced challenges.	1	2	3	4	5
4. We demonstrated self-control. i.e. We resisted temptation to become distracted.	1	2	3	4	5
5. We demonstrated a growth mindset by trying to improve our understanding and CERR skills.	1	2	3	4	5
6. Group members demonstrated respect for each other.	1	2	3	4	5
7. All group members should be able to write a strong evidence-based argument about which diet is best for fitness-for-life.	1	2	3	4	5

Additional Comments or Questions: