

## NUTRITIONAL ANALYSIS

### Performance Standards 12A/11A/13B.I

Students will apply the processes of scientific inquiry to explain metabolic processes in the context of nutritional analysis accordingly:

- *Knowledge*: understand the concepts of nutritional balances and imbalances in diets.
- *Application*: analyze a personal diet diary to determine nutritional deficiencies and sufficiencies.
- *Communication*: compare projections about dietary deficiencies over time and possible preventative or compensatory measures for the deficiencies.

### Procedures

1. ***In order to know and apply concepts that explain how living things function, adapt and change (12A); the concepts, principles and processes of scientific inquiry (11A); and concepts that describe the interaction between science, technology and society (13B)***, students should experience sufficient learning opportunities to develop the following:

- Formulate hypothesis related to the correlation between diet and long-term health effects.
- Reference pertinent research associated with diet and long-term health with a special focus on commercial preparation (including school and fast food sources).
- Collect resource information from specific fast food establishments and websites for nutritional information.
- Design an investigation strategy to compare personal diet diaries, possible fast food diet reliance and minimal established nutritional requirements.
- Use appropriate technologies to collect and measure data.
- Interpret and represent analysis of results to produce findings.
- Present findings for class review and comparisons.
- Generate further questions or issues for consideration about dietary requirements and modifications to personal diet habits.

Note to teacher: This activity relates to knowledge associated with Standards 12A and 13B, while addressing the Performance Descriptors for Stage I within Standard 11A. Family and Consumer Sciences (FCS) students will enhance their knowledge of conducting an issue investigation that will be beneficial in their careers and learn the importance of maintaining a healthy diet. This assessment addresses the National FCS Standards #9.0 (Food Science, Dietetics and Nutrition) and #14.0 (Nutrition and Wellness). It also addresses the Foodservice Cluster occupational skill standards #4 (Follow safe food handling and sanitation procedures), #14 (Ensure customer satisfaction) and #33 (Plan menus) and Illinois Workplace Skills in the areas of Solving Problems and Critical Thinking, Communicating on the Job and Maintaining a Safe and Healthy Work Environment. Students may use their findings in the following Family, Career and Community Leaders of America (FCCLA) STAR events: Illustrated Talk, Applied Technology, Entrepreneurship, Food Service, Student Body and Power of One.

2. Have students review and discuss the assessment task and how the rubric will be used to evaluate their work.
3. Set the stage for this activity by having students record what they eat for a week including all food that they eat from fast food restaurants, school cafeterias and home. Introduce students to online resources or software programs that are designed to analyze food intake. After determining their nutritional intake, divide students into groups to study nutritional deficiencies that can be projected from over- or under-balance of proteins, fats, fiber, carbohydrates and specific vitamins and minerals. Provide each student with a copy of the "Dietary Problems" to use with their analysis. They should determine what problems can be expected in the short and long term for the 'mis-balance.' Some physical problems such as heart disease, high cholesterol and being overweight could be a result of eating a wrong combination of foods. Discuss variety of personal resolutions (for a month, several weeks, etc.) about dietary impact and changes. Revisit the discussion about resolutions periodically. As an extension, students may do added research on the internet related to fast food restaurants, rating the menus as to the quality of their diets, if they were to eat there every day for one week. They could evaluate school nutritional programs, as well, using national or state requirements that regulate the programs. Students will present the data they have obtained with posters, technology, demonstration or other means agreed upon by teacher and student.

4. Evaluate each student's work using the Science Rubric as follows, and add the scores to determine the performance level:
- *Knowledge*: The concepts associated with nutritional balances were complete and accurate.
  - *Application*: The research on the effect of food intake over a period of time was complete and correct.
  - *Communication*: The comparative projections about dietary impact were insightful and accurate.

#### **Examples of Student Work**

- [Meets](#)
- [Exceeds](#)

#### **Time Requirements**

- One-to-two days for classroom introductory sessions
- One-to-two weeks for individual research
- One week for research presentations and comparative discussions

#### **Resources**

- Guest speakers who can offer nutritional information
- Foods textbooks and nutritional information
- Applied Biology/Chemistry by CORD Communications
- Dietary Analysis Student Idea Page
- Websites
  - <http://www.nat.uiuc.edu/>
  - <http://www.nal.usda.gov/fnic/etext/000108.html>
  - <http://www.webdietitian.com/nutranalysis/analysis.html>
  - <http://www.foodcount.com/>
  - <http://www.navigator.tufts.edu/>
- Food Science Safety and Nutrition Curriculum resource book
- Science Rubric

## DIETARY ANALYSIS STUDENT IDEA PAGE

Complete your diet diary for one week.  
Analyze your nutritional intake.

In groups, research the various nutritional imbalances listed below. Try to be specific in your assigned category.  
Evaluate your own diet projections about imbalances.  
Discuss and make personal resolutions.

Protein  
overbalance/under  
balanced

Fiber overbalance/under  
balanced

Vitamin  
overbalance/under  
balanced

Mineral  
overbalance/under  
balanced

Fat overbalance/under  
balanced

Carbohydrate  
overbalance/under  
balanced

Other deficiencies

## SCIENCE RUBRIC

Exceeds - must receive no more than one 3 and the rest 4s in the other areas of the rubric.

Meets - may receive no more than one 2 and a combination of 3s and 4s in the other areas of the rubric.

Approaches - may receive no more than one 1 and a combination of 2s, 3s or 4s, in the other areas of the rubric.

Begins - must receive at least a 1 in all 3 areas of the rubric.

	<b>KNOWLEDGE</b>	<b>APPLICATION</b>	<b>COMMUNICATION</b>
	Knows and understands scientific terms, facts, concepts, principles, theories and methods.	Applies scientific knowledge, skills and methods to manipulate, analyze, synthesize, create and evaluate.	Communicates scientific knowledge and applications through writing, speech and visual displays.
<b>4</b>	<ul style="list-style-type: none"> <li>• Descriptions of scientific terms, facts, concepts, principles, theories and methods are complete and correct.</li> </ul>	<ul style="list-style-type: none"> <li>• Applications are thorough, appropriate and accurate.</li> </ul>	<ul style="list-style-type: none"> <li>• Written, oral and/or visual communication is well organized and effective.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>• Descriptions of scientific terms, facts, concepts, principles, theories and methods are mostly complete and correct.</li> </ul>	<ul style="list-style-type: none"> <li>• Applications are mostly thorough, appropriate and accurate.</li> </ul>	<ul style="list-style-type: none"> <li>• Most of the written, oral and/or visual communication is well organized and effective.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• Descriptions of scientific terms, facts, concepts, principles, theories and methods are somewhat complete and correct.</li> </ul>	<ul style="list-style-type: none"> <li>• Applications are somewhat appropriate and accurate.</li> </ul>	<ul style="list-style-type: none"> <li>• Some of the written, oral and/or visual communication is organized and effective.</li> </ul>
<b>1</b>	<ul style="list-style-type: none"> <li>• Descriptions of scientific terms, facts, concepts, principles, theories and methods are minimally present or correct.</li> </ul>	<ul style="list-style-type: none"> <li>• Applications are minimally appropriate and accurate.</li> </ul>	<ul style="list-style-type: none"> <li>• Little of the written, oral and/or visual communication is organized and effective.</li> </ul>
<b>0</b>	<ul style="list-style-type: none"> <li>• All descriptions of scientific terms, facts, concepts, principles, theories and methods are missing and/or incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>• All applications are missing and/or incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>• All of the written, oral or visual communication is missing and/or lacks organization.</li> </ul>
<b>Score</b>			